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Assessment of Caregivers' Awareness about Home Care of Neutropenia among Children with Leukemia at Oncology Wards in Baghdad City

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ABSTRACT

Objective(s): to assess the awareness of caregiver about homecare neutropenia among children with leukemia at oncology wards, and to find out relationship between level of awareness of caregivers and demographic variable. A descriptive study carried out at Baghdad City from1st of February 2018 to 30th of September 2018. Non-probability sample of (50) males and females caregivers was selected from the oncology wards in Child Welfare, Child's Central, Al-Kadhmiya and Baghdad Teaching Hospital. To achieve the purposes of the study, a questionnaire format was designed and constructed by the researcher depending on the extensive review of available, related literatures and studies. The first part is related to caregivers' demographic characteristics and the second part (three domains) is related to daily activities of caregivers about home care neutropenia among children with leukemia at oncology wards. Data were analyzed through the application of descriptive statistical analysis (Frequency, Percentage, Mean and Standard deviation) and inferential statistic (significance and correlation coefficient). The study revealed that the majority percentage of caregiver's responses toward personal hygiene domain were 82% don't know about use a moisturizers to prevent dry skin , also 60% don't know that use of mouth wash contain alcohol was contraindicated for child.

Keywords: *Assess; Awareness; Caregivers'; Neutropenia; Home care*

INTRODUCTION

Neutropenia is a blood condition (granulocyte disorder), that characterized by a deficiency of neutrophils which is a type of white blood cell that defends the body against bacterial and fungal infections. They are made in bone marrow and contain microscopic granules with proteins (enzymes) that digest invading bacteria viruses, fungi, and parasites [1]. If the child has neutropenia, close attention should be given to personal hygiene, like hand washing in order to decrease the risk of infection. Many factors can share the onset of low level of neutrophils such as some types of chemotherapy, cancers that affect the bone marrow directly such as leukemia lymphoma, and myeloma [2]. Infections are the major cause of mortality and morbidity in children. The risk of infections is principally related to the intensity and duration of the immune suppressive chemotherapy [3]. Caregivers of children with neutropenia require knowledge, skills, and judgment to carry out the tasks of care for their sick children. Caregivers may help the patient with daily tasks such as bathing, eating, cleaning the home and preparing meals. Also, caregivers must have jobs to handle the requirements and support the needs of their children who require such assistance and this care helps them stay at home versus living in a facility [4]. The capacity of caregivers to take on the care of the child with neutropenia may have a significant influence on both health outcomes and cost. Children suffer from many health problems and complications as a result of the disease process or the course of treatment. The caregivers may have more knowledge and skills for managing their children illness [5]. The care of children with neutropenia is a complex procedure that requires the

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use of specialized knowledge of the mothers. To enhance knowledge of mothers concerning the disease, causes, cure and prevention. The knowledge will eventually become an indispensable tool that can be shared to others and will never go out of style. Appropriate care and assessment of children with neutropenia is an important part for improvement the health status of the children and decreased the complication [6].

MATERIALS AND METHOD

A descriptive study was carried throughout the period from1st of February 2018 to 30th of September 2018. Non-probability sample of (50) caregivers about home care neutropenia among children with leukemia at oncology ward in Child Welfare, Child's Central, Al-Kadhmiya and Baghdad Teaching Hospital. To achieve the purposes of the study, a questionnaire format was designed and constructed by the researcher depending on the extensive review of available, related literatures and studies. The study instruments (questionnaire) consisted of two major parts. The first part was related to caregivers' demographic characteristics such as age, gender, educational level, employment, degree of kinship, source of knowledge, income, and the second part was related to daily activities of caregivers about home care neutropenia among children with leukemia at oncology wards. It consisted of three domains (personal hygiene, health and safety of family, and life style). Each domain had 12 items about different aspect of the related domains.The questionnaire was rated on a three likert scale (know, uncertain, and don't know) and was scored as 3 for (know), 2 for(uncertain), and 1 for (don't know). The validity of the questionnaire was established through a panel of (10) experts of different specialties related to the field of the present study. They were asked respectively to review the questionnaire for clarity and adequacy in order to achieve the present study objective. Study sample was excluded .Data were analyzed through the application of descriptive statistical analysis (Frequency, Percentage, Mean and Standard deviation) and inferential statistic(significance and correlation coefficient) and by using SPSS version 20.

RESULTS AND DISCUSSION

The present study revealed that 92% of the sample were females and 64.0% of the caregivers were mothers. These results agreed with a study done by Scarpelli, et al. (2008) who indicated that the higher percentage of their sample 76% was mothers. The caregivers were mostly the patient's spouse, partner or closest relatives, and females were more tuned to the caring function at home [7]. The current study revealed that 40% of the sample were at age ranging 20-30 years old. These results disagreed with a study done by Al-Jauissy (2010) who indicated that the higher percentage of caregivers age were between 19 to 50 years old[(8)]. With regards to caregivers level of education the present study showed that20% each level were literate and Intermediate school graduates. These results agreed with a study done by Alexander (2009) who reported that the majority of parents were not having much education, and he found that 25% were illiterate and 45% have their education till grade ten [9]. The present study showed that 86% of the study sample was unemployed. These results agreed with a study done by Al-Jauissy (2010) who indicated that the most of caregivers' occupation 76.3% were housewives. This result indicated that the main occupation of females in our society was being housewives [8]. The present study found that 44.0% of the caregivers got knowledge related to awareness from nurses. The results of this study disagreed with results obtained by Al- Ibady (2011) who demonstrated that nurses themselves didn't get information from any resource also include a high percentage 52.5%[(10)]. This could be due to the nature of the nurses are considered closer to patients, in addition to spend more time with patients. The current study showed that 40% of the families were having a barely sufficient income to cover their expenses. The results of this study disagree with results obtained by Atlanta, et al. (2008) which mentioned that the majority of cancer caregivers were belong to the lower socio economic status class . The concerns relating to the family's wellbeing change in role and responsibilities, relocation, travelling, difficulty arranging blood and its products, and financial difficulties facing after the diagnosis of leukemia [11.] Also, agreed with a study done by by Scarpelli, et al. (2008) which mentioned that the cancer caregivers were living with intermediate socio economic status class [7]. The current study showed that the majority of the caregiver's response toward personal hygiene domain were 82% don't know about use a moisturizers to prevent dry skin , also 60% don't know that the use of mouth wash contain alcohol was contraindicated for child . These results agree with study done by Hasan , et al.(2011) , who conducted a study on assessment of home care management for caregiver's having leukemic adolescent patient in Erbil city which

shows the majority of caregivers had poor practices regarding preparing meals, with poor practice regarding oral hygiene [12]. The present study revealed that the high percentages of caregiver's response about health safety domain were 78% don't know about use mouth wash which contain alcohol item. And 62% of caregiver's response were don't' know about avoid putting natural plants inside the house. Also 46.0% don't' know about do not use suppositories items. And showed that the caregiver's response toward life style domain were 64% "don't know that the exercise daily important for child" item. And 54% were, Don't know that avoiding the sun , rain and cold . Also 42% were don't' know about ensure the use of pasteurized milk. This result agree with study done by Hasan , et al.(2011) , who found that the caregivers of adolescent leukemia patients had deficit in knowledge and low practices regarding home care management [12.] The present study stated that there were significant relationships between personal hygiene and lifestyle of family caregiver with their income. There were significant relationship between level of education and source of knowledge, and also there were significant relationship between income and employments of the caregivers at p ≤value 0.05. This study agrees with the study done by Scalone, et al .(2008) which stated that there is no signification relationship between age of mothers with their practice regarded desferal therapy [13.]

Table 1. Socio-demographic Characteristics of caregivers among children with Leukemia

Variables	Classification	Frequency	%
Gender	Male	4	8.0
	Female	46	92.0
	Total	50	100
2- Age group	20-30 years	20	40.0
	31-40 years	19	38.0
	41-50 years	6	12.0
	51-60 years	5	10.0
	Total	50	100
Mean ± SD = 33.2± 12.5			
3- Level of Education	Illiterate	9	18.0
	Literate	10	20.0
	Primary school	9	18.0
	Intermediate school	10	20.0
	Secondary school	6	12.0
	Institute graduate	3	6.0
	College and above graduate	3	6.0
	Total	50	100
4- Employment	Unemployed	43	86.0
	Freelancers	5	10.0
	Government employee	1	2.0
	Retired	1	2.0
	Total	50	100
5- Degree of kinship	Mother	32	64.0
	Father	4	8.0
	Sister	2	4.0
	Aunt	7	14.0
	Grandmother	5	10.0
	Total	50	100

Table 2. Caregiver's Responses toward Personal Hygiene Domains

No	Items	Know		Don't Know	
		f	%	f	%
1	Hand washing with soap and antibacterial, especially before and after eating, using the bathroom, playing, touching animals and others	44	88.0	6	12.0
2	Daily bathing, especially during summer	41	82.0	9	18.0
3	Use a moisturizer to prevent dry skin	9	18.0	41	82.0
4	Genital areas of the male and female hygiene after urination and defecation	49	98.0	1	2.0
5	Use an electrical razor instead of using ordinary razor	24	48.0	26	52.0
6	Pruning the hair and nails once every two weeks to ensure cleanliness	32	64.0	18	36.0
7	Wearing clean clothes, and change underwear every day	48	98.0	2	4.0
8	Dental floss prohibited	20	40.0	30	60.0
9	Not sharing eating's' utensils with others	30	60.0	20	40.0
10	Avoid any injuries or scratching to the skin	36	72.0	14	28.0
11	Use a toothbrush after meals and before going to sleep	35	70.0	15	30.0

Table 3. Caregiver's Responses toward Health Safety Domain

No	**Items**	**Know**		**Don't Know**	
		f	**%**	**f**	**%**
1	Avoid approaching people suffering from colds and flu - Measles - smallpox - or any other type of infection.	41	82.0	9	18.0
2	Avoid crowded places as markets and places of public entertainment.	30	60.0	20	40.0
3	See the doctor immediately when: increase in temperature than 38º Celsius-difficulty in breathing, pain-blood in urine or stool.	39	78.0	11	22.0
4	Keep the house clean.	42	84.0	8	16.0
5	Do not use suppositories.	27	54.0	23	46.0
6	No vaccinations only after doctor consultation.	47	94.0	3	6.0
7	Wash hands before and after eating.	47	94.0	3	6.0
8	Shoes should be left at door mats	42	84.0	8	16.0
9	Avoid contact with the stool or urine	47	94.0	3	6.0
10	Avoid putting natural plants inside the house.	19	38.0	31	62.0
11	Do not use mouthwash which contains alcohol.	11	22.0	39	78.0
12	No pets inside the house	28	56.0	22	44.0

Table 4. Caregiver's Responses toward Life Style Domain

No	Items	Know		Don't Know	
		f	%	f	%
1	Exercises daily and regularly .	18	36.0	32	64.0
2	Adequate sleep during the night and take a nap	34	68.0	16	32.0
3	Avoid constipation by drinking water and eating food rich with fibers	31	62.0	19	38.0
4	Proper diet and avoid junky food	30	60.0	20	40.0
5	Wash all fresh fruits and vegetables well before eating	44	88.0	6	12.0
6	Canned foods should be watched for date of expiration and ingredients	30	60.0	20	40.0
7	Ensure the use of pasteurized milk	29	58.0	21	42.0
8	Using clean and uncontaminated water	32	64.0	18	36.0
9	Take the medications prescribed by the doctor	41	82.0	9	18.0
10	Getting rid of extra and remained food from bed room	42	84.0	8	16.0
11	Ensure on-non participation of tooth brush from someone to another	47	94.0	3	6.0
12	Avoid the sun , rain and cold.	23	46.0	27	54.0

Table 5. Relationship between Caregiver's Awareness and their Socio-Demographic Characteristics

Variables		Age group	gender	Level of education	Employments	Sours of knowledge	income	lives	Personal Hygiene	Health safety
Age group	Pearson Correlation	1	-.024-	.099	.067	-.178-	.095	-.233-	.279	.025
	Sig. (2-tailed)		.869	.494	.646	.217	.511	.103	.050	.863
	N	50	50	50	50	50	50	50	50	50
gender	Pearson Correlation	-.024-	1	-.186-	-.187-	-.074-	.045	.028	.233	.110
	Sig. (2-tailed)	.869		.197	.192	.609	.758	.849	.103	.448
	N	50	50	50	50	50	50	50	50	50
Level of education	Pearson Correlation	.099	-.186-	1	.387**	.544**	-.193-	.129	.087	.091
	Sig. (2-tailed)	.494	.197		.005	.000	.180	.372	.550	.530
	N	50	50	50	50	50	50	50	50	50
Employments	Pearson Correlation	.067	-.187-	.387**	1	.175	-.286-*	-.166-	.022	.021
	Sig. (2-tailed)	.646	.192	.005		.223	.044	.250	.882	.887
	N	50	50	50	50	50	50	50	50	50
Sours of knowledge	Pearson Correlation	-.178-	-.074-	.544**	.175	1	-.065-	.168	.119	-.063-
	Sig. (2-tailed)	.217	.609	.000	.223		.652	.244	.409	.662
	N	50	50	50	50	50	50	50	50	50
income	Pearson Correlation	.095	.045	-.193-	-.286-*	-.065-	1	-.278-	.377**	.254
	Sig. (2-tailed)	.511	.758	.180	.044	.652		.051	.007	.075
	N	50	50	50	50	50	50	50	50	50
Personal hygiene	Pearson Correlation	.279	.233	.087	.022	.119	.377**	-.069-	1	.541**
	Sig. (2-tailed)	.050	.103	.550	.882	.409	.007	.633		.000
	N	50	50	50	50	50	50	50	50	50
Healthy safety	Pearson Correlation	.025	.110	.091	.021	-.063-	.254	-.054-	.541**	1
	Sig. (2-tailed)	.863	.448	.530	.887	.662	.075	.709	.000	
	N	50	50	50	50	50	50	50	50	50
Life style	Pearson Correlation	.223	.252	.174	.015	.110	.445**	-.022-	.752**	.519**
	Sig. (2-tailed)	.120	.078	.228	.918	.446	.001	.878	.000	.000
	N	50	50	50	50	50	50	50	50	50

CONCLUSION

the majority of caregivers response toward personal hygiene domain were 82%don't know that the use a moisturize to prevent dry skin item, also the high percentage of caregivers response about health safety domain were 78% don't know a bout use mouth wash which contain alcohol item. And the caregiver's responses toward life style domain were 42% were don't' know about ensure the use of pasteurized milk.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing, University of Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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Antioxidant Enzyme Responses of *Juncus Aschers. (Et Buch.) Adams* to Some of Environmental Stresses and use it as Indicators

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ABSTRACT

Reported in this paper responses of *Juncus Aschers.* (*Et Buch.)*Adams (*Juncus A*.) plants antioxidant, The catalase (CAT), ascorbate peroxidase (APX), superoxide dismutase (SOD) and peroxidase activity (POD) as a scavenger of ROS for mitigating the environmental stress. The study was deal with monthly study of eighteen physico-chemical parameters during the period from January 2017 to June 2017, and 4 sites were selected from Baher Al-Najef Depression (BAND) at the Al-Najef Al-Ashraf city /Iraq , The results showed positive correlation between air and water temperature, and positive correlation between annual precipitation with DO, EC, TDS,TSS , SAL, $HCO3^{=}$, $CO3^{-}$, Cl^{-},$SO4^{=}$ and pH , While BOD,$PO_4^{=}$ and $NO_3^{=}$ showed negative correlation . During the sampling path, physical chemical factors were found to be much higher in second site compared to the other site. In the spring, the high concentration of pollutants from it in the winter. This led to high activity of antioxidant enzymes. Current experience has indicated that in a stressful conditions, *(Juncus A.)* Plants overcome stress by altering the activities of the stress enzyme, suggesting evidence of an adaptive mechanism to thrive in a stressful environment and the appropriateness of *(Juncus A.)* Of environmental condition (as indicators), especially under modified climatic conditions.

Keywords*: Juncus Aschers., Environmental stress, Antioxidant enzyme, catalase (CAT), ascorbate peroxidase (APX), superoxide dismutase (SOD) and peroxidase activity (POD).*

INTRODUCTION

Studies show that (Juncus A.) grows in the soil of different pH, salinity, fertility and textures, and achieve high productivity under different climatic conditions [1]. Juncus has demonstrated its ability to reduce the pollution of the surrounding environment and has been a unique system, where environmental stress is the most restrictive factor [2]. To survive stress, many physiological and biochemical changes occur in different plant species [3]. Plant interactions with water stress are significantly different at different organizational levels depending on the severity and duration of stress as well as plant species and their growth stage [4]. Under environmental stress, the plant uses many adaptive strategies in response to various abiotic stresses such as high nutrients [5], low oxidation potential of sediments and toxic substances; high salt, cold, heat and excessive osmotic pressure, ultimately affecting plant growth and productivity [6]. Plant cells and tissues show many metabolic responses to environmental stress, some of which may have adaptive importance [7]. The level of reactive oxygen species (ROS) in plants is controlled by synchronous action of enzymatic and nonenzymatic antioxidants. Among enzymatic antioxidants catalase (CAT), ascorbate peroxidase (APX), superoxide dismutase (SOD) and peroxidase activity (POD) are important scavengers of ROS [8]. The physiological effects of Environmental stress on this plant have not been well studied [9]. (BAND) also have not been well studied too. In the present study, A sub-acute experiment was conducted to examine the combined effects of Environmental stresses on *(Juncus A.)* by testing antioxidants defense system of the plant to identify their potential role as biomarkers (indicators).

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To this aim we tested the following hypotheses:

Some physical and chemical characters of (BAND) water.

The climate factors in (BAND) .

The combined effects of Environmental stresses on *(Juncus A.)* by testing antioxidants defense system of the plant in (BAND) .

MATERIALS AND METHODS

-Determination of the (BAND)

(BAND), located in the province of Najaf in Iraq. It is separated from the Euphrates River only fifteen kilometers. (BAND)width is about 16 kilometers southeast. However, in the middle , shrinks to about (10 km). Which extends to a distance of (40 km) northwest of Najaf to the southwest of the city of Al-Hira. While it is bordered to the east by the Mashkhab-Najaf road and on the western line linking Iraq's strategic oil from the south to the north-west. Four different sites were selected in BAND.

1. Site 1 contains various chemicals from the southern nutrient tributaries (household detergents and pesticides from agriculture).

2. Site 2 contains various chemicals from industry and municipal wastewater.

3 - Site (3) contains the amount of salts from the ground wells.

4 - Site (4) is located near the strategic oil line, which is often suffering from oil pollution.

-Environmental characteristics of the (BAND)

-Water samples were collected monthly from January / 2017 to June / 2017. Where samples were collected from a depth of 30 cm below walls surface for each of studies stations and using polyethylene containers for physical and chemical analysis of water and used glass bottles 250 ml (Winkler bottles) transparent and the other opaque to measure dissolved oxygen(DO) and oxygen biochemical demand (BOD5) .

- water temperature(C°), pH, Electrical Conductivity (EC) , Salinity and Dissolved Oxygen(DO), were measured by using Multi Lab pilot V 4.4 (5.03), turbidity by using a nephelometer Lamotte (WTW)U.S.A 1979 .

- TDS(Total dissolved solids) ,TSS(Total suspended solids), Bio-oxygen demand (BOD5),Calcium(Ca^{+2}) , Magnesium (Mg^{+2}), Chlorides(Cl^{-1}), Sulphate(SO_4^{-2}), Carbonates(CO_3^{-3}), bicarbonates (HCO_3^{-2}), nitrate(NO_3^{-2}), phosphate (SO_4^{-2}) using adopted methods of American Public Health Association (APHA,2003) .

.The climatological features of the sites included mean annual precipitation (mm/m2), mean annual temperature (C°).

Plant materials

Plant materials were harvested in four different locations in each region. Plants were harvested twice during the study. Season at the end of winter, spring. The sample collected in the ice bucket and in the shortest possible time brought to the laboratory. The plant samples were cleaned with tap water and distilled water, the fresh plant material (expanded leaves and not completely damaged) was separated from the whole plants and kept in cool place -20C for studies. The leave samples were homogenized (0.5 g) in the 0.1 m cold phosphate ice solution (pH 7.5) containing 0.5 mL molar of EDTA with pre-formed grout and mortar. The homogeneity was transferred to centrifuge tubes and centrifuged at 4C يف in the Beckman refrigerated centrifuge at 15000 r.p.m. For 15 minutes. The floating material was transferred to 30 mL of tubes and reference was made to the enzyme extract.

Enzyme assays:

Superoxide Dismutase (SOD) activity determination: According to Marklund and Marklund (11), reaction mix is consisting of 50 µl crude enzyme extract with 2 ml of tris buffer and 0.5 ml of pyragallol (0.2 mM) which absorbs light at 420 nm. Control solution contains the same materials except for the enzyme extract that was replaced by dH_2O. As a blank, dH_2O was used. Single unit of enzyme is defined as the amount of enzyme that is capable of inhibiting 50% of pyragallol oxidation.

Catalase (CAT) (EC 1.11.1.6) activity was measured according to Beer and Sizer (12), with minor modifications. The reaction mixture (1.5 mL) consisted of 100 mmol L-1 phosphate buffer (pH 7.0), 0.1 mmol. L^{-1} EDTA, 20 mmol. $L^{-1}H_2O_2$ and 20 µL enzyme extract. The reaction was started by addition of the extract. The decrease of H_2O_2 was monitored at 240 nm and quantified

by its molar extinction coefficient (36 M-1cm-1) and the results expressed as CAT units mg^{-1} of protein (U = 1 mM of H_2O_2 reduction min^{-1}. mg^{-1}protein).

Ascorbate peroxidase (APX)(EC 1.11.1.11) activity was determined according to Nakano and Asada (13). The reaction mixture contained 50 mM potassium phosphate (pH 7.0), 0.2 mM EDTA, 0.5 mM ascorbic acid, 2% H_2O_2, and 0.1 mL enzyme extract in a final volume of 3 mL. The decrease in absorbance at 290 nm for 1 min was recorded and the amount of ascorbate oxidized was calculated using extinction coefficient (_ = 2.8 mM^{-1} APX was defined as 1 mmol. mL^{-1} per min at 25°C. cm^{-1}). One unit of Ascorbate oxidized as 1 mmol. mL^{-1} ascorbate oxidized per min at 25C°.

Peroxidase (POD) (EC 1.11.1.7) activity was estimated according to Hemeda and Klein (14). The reaction mixture contained 25 mmol. L^{-1} phosphate buffer (pH 7.0), 0.05% guaiacol, 10 mmol. L^{-1} H_2O_2 and enzyme. Activity was determined by the increase in absorbance at 470 nm due to guaiacol oxidation (E = 26.6 mM^{-1} cm^{-1}).

Statistical analysis

Analysis of variance was performed using SAS version 9.1(SAS Institute Inc., Cary, NC, USA) (15). The data were presented as the means for each treatment. Means were compared using the LSD test at the 0.05 probability level.

RESULTS AND DISCUSSION

In order to determine the nature and extent of physical-chemical stress on macrophytes, eighteen parameters of water and climate were compared between four different locations for six months. Table (1) shows the spatial and temporal changes of the physical chemical parameters of water (BAND). The detergent of household and pesticide from the runoff from the southern tributaries of the nutrient to site-1 contains different chemicals. The municipal wastewater collected at Site 2 also contains various chemicals from the industry. S-3 water has been reduced by mountain salts from the earth walls. Site-4 is located near the strategic oil line, so the higher values were respectively the location 2> location 3> 4> 1, for all physical chemical parameters. Due to high temperature and evaporation the DO, EC, TDS,TSS and SAL were high in spring in all the four sites and due to heavy rainfall in winter the water got diluted so all those components were lowered down. The same pattern was also seen in $HCO3^{=}$, $CO3^{-}$, Cl^{-},$SO4^{=}$ and pH concentrations (Table 1).While BOD,$PO_4^{=}$, $NO_3^{=}$ was arise in winter and decreases in spring due to thrive plants in spring. The one way ANOVA was executed based on the physico-chemical parameters to reveal the differences between four sites. The COND, TDS, TSS, SAL, $HCO_3^{=}$, CO_3^{-} , Cl^{-},$SO_4^{=}$ and pH were higher in Site 2 than the other sites(Table 1). The results showed positive correlation between air and water temperature, and positive correlation between annual precipitation with DO, EC, TDS,TSS , SAL, $HCO3^{=}$, $CO3^{-}$, Cl^{-},$SO4^{=}$ and pH , While BOD,$PO_4^{=}$ and $NO_3^{=}$ showed negative correlation.

Antioxidant enzyme activities:

In contrast to four sites, the activity of SOD , CAT,APX and POD in *(Juncus A.)* were significantly (at $P < 0.05$) high in Site 2 and Site 3 than other sites (Figs. 1,2,3,4) The SOD activity did not change significantly (at $P < 0.05$) in winter and spring season but increased significantly in different sites , we observed in SOD activity high in Site 2 and Site 3 than 4 and at last site 1(Fig.1). The activity of CAT increased significantly (at $P < 0.05$) in spring than in winter season and increased significantly in different sites , we observed in CAT activity high in Site 2 > Site 3 > 4 and at last site 1.. However, the CAT activity was higher in cold stress than in the pollutant stress (Fig.2). (Fig. 3) showed the highest activity of stress enzyme APX in the contaminated sites at spring seasons than in winter .The APX activity was increased significantly (at $P < 0.05$) in site(2) followed by (3) and (4) at last (1). The POD activity was highest in site(2) followed by (3) and (4) at last (1).but not change significantly (at $P < 0.05$). (Fig. 4) showed the highest activity of stress enzyme POD in the contaminated sites at spring seasons than in winter. The results showed that the site 2 contains the highest concentration of studied parameters and each duration of the study. This means that the waste water that was dumped in this site was the highest percentage of pollution and therefore the plants developing in this site suffer from stress more than the rest of the plants of other sites. Followed by site 3, whose water contains a high proportion of salts and salts is another type of stress factor on plants developing in that region. The Site 4 and Site 1 were the lowest concentrations of the studied parameters. Therefore, the plants of these sites are the least affected by the stress compared to the other studied

sites. When observing the results of the enzymes, their effectiveness increases with the increase of pollutants in the environment in which the plant grows. Physical and chemical factors of water body if increased Its threshold level caused some stress to its biomass. The imbalance between active oxygen production and elimination is often caused by many chemicals. The antioxidant enzyme, such as SOD, CAT, APX, and POD, protects tissues against reactive oxygen species. Water quality deteriorates (BAND). Therefore, factors such as EC, TDS, TSS, and SAL are significantly high in site 2> site 3> 4> 1. In addition the higher concentration of pollutants in the contaminated sites stimulates the oxidative stress in the wetland macrophytes (Figs.1,2,3,4).

Table 1. Temporal variation of physic-chemical parameters of water in four stations in (BAND) by mean value of two seasons .

Sequence	Season Station	The mean value in Winter				The mean value in Spring				unit
	parameter	Station (1)	Station (2)	Station (3)	Station (4)	Station (1)	Station (2)	Station (3)	Station (4)	
1	precipitation	2	2	2	2	0	0	0	0	(mm/m2)
2	air temperature	29	30	27	27	39	40	38	37	(Silesia)
3	Water temperature	24	25	20	21	32	33	31	30	(Silesia)
4	pH	8.3	8.7	8.6	8.1	8.9	9.5	9	10	
5	Electrical conductivity (EC)	1007	3302	2903	1202	1708	3930	3540	1770	(µS / cm)
6	Total Dissolved Solids (TDS)	462	549	843	856	572	787	1.019	1.340	(mg / L)
7	Suspended solids (TSS)	1.654	1.270	0.876	0.912	2.325	1.530	1.210	1.721	(mg / kg)
8	Nitrate($NO3^{-2}$)	0.492	0.589	0.325	0.302	0.432	0.356	0.345	0.231	(mg / L)
9	Phosphate(PO_4^{-2})	2.540	3.100	3.021	4.654	2.211	1.762	1.342	0.865	(mg / L)
10	Water hardness	375.4	241.6	354.7	345.4	386.7	260.2	342.6	337.7	(mg / L)
11	Chloride(Cl^{-1})	167.67	1704.7	506.92	864.01	178.2	2490.2	633.43	953.63	(mg / L)
12	Carbonate(CO_3^{-3})	114.5	116.1	117.4	115.5	118.8	123.5	123.2	121.3	(mg / L)
13	Bicarbonate (HCO_3^{-2})	97.6	112.5	98.6	98.2	100.6	114.4	102.3	97.9	(mg / L)
14	Sulfate(SO_4^{-2})	265.8	850.3	771.8	331.5	296.2	959.3	654.5	413.5	(mg / L)
15	Dissolved Oxygen (DO)	5.9	5.25	6.83	5.65	2.09	1.15	2.18	2.70	(mg / L)
16	Bio-oxygen demand(BOD)	0.68	0.84	1.013	1.019	0.60	1.09	1.48	1.50	(mg / L)
17	turbidity	3.36	5.84	4.5	3.4	7.21	5.33	5.91	6.74	(cm)
18	Salinity	6	23,8	17..6	7.2	10.2	28.8	21.7	12.2	(ppt.)

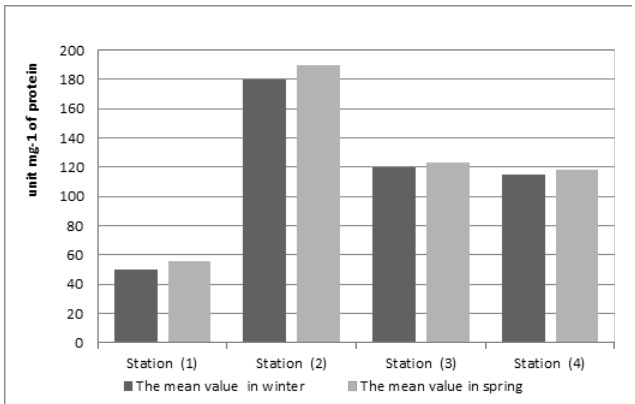

Figure 1. SOD responce in diffrent stations

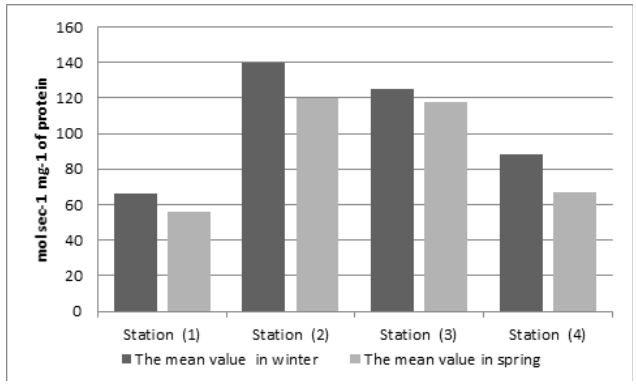

Figure 2. CAT responce in diffrent stations

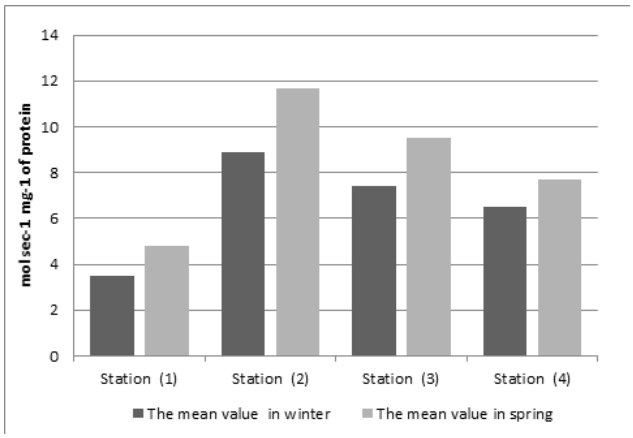

Figure 3. APX responce in diffrent stations

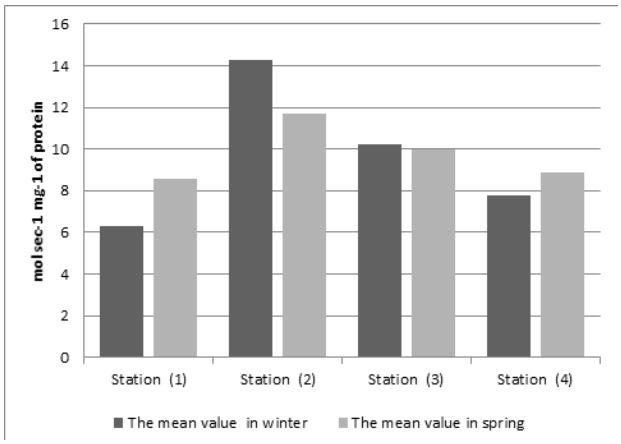

Figure 4. POD responce indifrent station

CONCLUSION

SOD, CAT, APX and POD provide the first defense line against oxygen toxicity in individuals. Generally in oxidative stress condition the SOD catalyzes dismutation of superoxide radical which in turn forms water and hydrogen peroxide. After that hydrogen peroxide being the substrate, it gets detoxified by CAT, APX and POD. The present study indicates that higher activity of CAT in *(Juncus A.)* Collected from contaminated sites was higher in winter due to cold stress of *(Juncus A.)*. The higher activity of APX and POD in spring due to higher concentration of pollutants than in winter. This clearly indicates that the enhanced production of superoxide radicals create an oxidative stress to the *(Juncus A.)* as pollutants indicator.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Environmental Sciences, Faculty of Sciences, Kufa University, Iraq and all experiments were carried out in accordance with approved guidelines.

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Anti-Quorum Sensing Nanonetwork

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ABSTRACT

Molecular communication is a bio-inspired communication mechanism, where information is exchanged through transmitting, propagating and receiving molecules between two nanometer-scale devices.The characteristics and rules that govern molecular communication are motivated by the communication in biological systems. In this paper a model of nanomachines is considered, one of these nanomachines has some special responsibilities to direct and control processes of the network. These nanomachines, communicate through a shared unguided medium by stipulating and controlling diffusion processes to form a nanonetwork. A protocol is proposed in which these nanomachines attempt to jam the communication among bacteria, through exploring the biological process of quorum sensing in bacteria. This process is a form of consensus among bacteria population. In order to activate bacteria to perform its task (whether it is a useful or harmful), bacteria need to reach consensus first. Thus, these nanomachines attempt to jam the communication among bacteria, through diffusing a molecule which has been tested in biological experiments to lock the bacteria receptors. The nanomachines follow Poisson distribution to diffuse their jamming molecule. Eventually, the proposed protocol is employing the network's nanomachines to prevent bacteria from reaching consensus and eventually from performing harmful activities.

Keywords: *Nanonetworks, Molecular Communication, Consensus, Poisson distribution, Quorum Sensing*

INTRODUCTION

A nanomachine is the basic functional unit of any nano-system. The component in these nanomachines is able to perform a specific task such as communication, computation, data storing, sensing and/or actuation at a nano level. The interaction between these nanomachines forms a nanonetwork. Thus, a nanonetwork expands the capabilities and applications of single nanomachine; where communication and sharing information are enabling nanomachines to execute more complex tasks in a distributed manner [1]. Molecular Communication can be considered as interdisciplinary which combines the research fields of nanotechnology, biotechnology, and communication technology. A wide range of research focus on studying the use of chemical communication by living cells. Quorum sensing process [2,3] is an example of signalling between bacteria, where bacteria can use it to estimate the density of their population in the environment through estimating the concentration of a certain type of molecules. The observation that communication in the biological systems is usually done through molecules, has gave inspiration to molecular communication. In literature there are several works which explore molecular communication, most of these research are focusing on characterising the information transmission by nanomachines and analysing the performance of these devices. The authors in [4] define the idea of molecular communication, and demonstrate the research challenges. Some research [5-7] focused on studying the consensus problem in molecular communication. Mainly [5] trying to map the quorum sensing to consensus problem under diffusion based molecular communication. Their goal is to study consensus problem by spreading information about an event or any variation through a diffusion based network. Through communication all nanomachines attempt to obtain the best estimate of this random variable. In this consensus problem the most significant element is diffusion. Diffusion can be defined as the spread of molecules through random motion from regions with high concentration to regions with lower concentration. All nanomachines in the nanonetwork have the ability to sense the concentration of molecules

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in the environment and produce new molecules with desired rate. This paper presents an attempt to explore security issues in molecular communication, through exploring the biological process of quorum sensing in bacteria. Where this process is a form of consensus among bacteria population. In order to activate bacteria to perform its task (whether it is a useful or harmful), bacteria need to reach consensus first. Thus, the nanomachines in the defined model are employed to prevent a harmful bacteria from launching their attack. Through proposing a protocol that nanomachines follow. Thus, these nanomachines are attempting to jam the communication among bacteria, through diffusing a molecule which has been tested in biological experiments to lock the bacteria receptors. This paper is organized as follows. In Section 2 the proposed model is described. Then, Section 3 explores the biological perspective of bacteria communication, and then presents the proposed protocol to prevent bacteria from launching an attack, through employing the network's nanomachines. Finally, Section 4 combines conclusions and prospective future work.

METHODOLOGY

Network Environment and Communication

In this paper a system of nanomachines is considered, thes nanomachines are communicating according to diffusion based molecular communication 1. Each nanomachine (where, i has the ability to sense the concentration of molecules from the environment and to emit molecules at a particular rate into the environment. One of these nanomachines is distinguished as that has some responsibilities for directing and controlling processes in the network. While the other nanomachines are distributed in different positions from within its transmission range distance . Communication between nanomachines is based on diffusing and sensing molecules. Each nanomachine from can decide to diffuse, for example, a unit of molecules at time , and any other nanomachine at distance from the nanomachine can sense the impulse of the released unit of molecules within the interval , through the following [11]

$$c(u,d,T) = \int_0^T u \cdot \frac{1}{(4\pi Dt)^{\frac{2}{3}}} \cdot \exp(\frac{-d^2}{4Dt}) \quad (1)$$

where D is the diffusion coefficient of the communication medium. If more than one nanomachine diffuses a unit u molecules, a receiver nanomachine j accumulates the sensed molecules through the summation of the values of $c(u,d,T)$ over diffusing nanomachines i, i.e., nanomachine j senses molecules in total during the interval $[t, t+T]$

$$\sum_i c(u_i, d_{(i,j)}, T_i) - c(u_i, d_{(i,j)}, [T_i - T]_+) \quad (2)$$

where, $d_{(i,j)}$ is the distance between nanomachines i and j, T_i is the time that passed from the diffusion of nanomachine i up to time $t+T$, i.e., nanomachine i diffused at time $(t+T-T_i)$, u_i is the unit of molecules by nanomachine i at that time, and $[T_i - T]_+$ equals to $\max\{T_i - T, 0\}$. In other words, the receiver nanomachine senses the total amount of molecules that have been in its nearest proximity in the time interval $[t, t+T]$ without being able to distinguish which molecules come from which transmitter. If the amount of sensed molecules is greater than or equal to threshold τ, it will be considered as 1, otherwise it is 0. The curve of the function. In Figure 1, $c(u,d,T)$ (the detected molecules) is computed, which represents the peak of molecular concentration sensed by receiver nanomachines at d= 0.01, 0.5, and 1 from a transmitter

nanomachine. The transmitter nanomachine is assumed to diffuse u=1 molecule, in a medium with diffusion coefficient D=10 cm^2/sec, initial value of time t=0 (the parameters values are based on an experiment in [12], the value of threshold is assumed to equal τ=0.5, through the experiment t is incremented by 0.01. The peak of the sensed molecular concentration is inversely proportional to the distance between transmitter and receiver nanomachines.

Time Slots Length

All the nanomachines n in the network are assumed to be synchronized, and can communicate in a predefined time slot T_0. Where T_0 is a system parameter and its length depends on the network's geometric properties, such that $T_0 = v\frac{d_{max}^2}{D}$, where v is a constant that can be equal 1; d_{max} is the transmission range distance of $node_c$, and D is the diffusion coefficient.

Preventing Consensus among Bacteria

Quorum sensing process [2, 3] is an example of signalling between bacteria, where bacteria can use it to estimate the density of their population in the environment through estimating the concentration of a certain type of molecules. In [13, 14] quorum sensing was proposed as a valid tool for signal amplification and synchronization between nodes in a nanonetwork, respectively.

Communication among Bacteria: Biological Background

Bacteria are one cell organisms, their life is based on nutrition consumption, then growing and dividing into two cells, and that process continues. However, bacteria in its different types interact with human body. Bacteria have very important roles in human health, but there are types of bacteria that can cause terrible harm to the human body 3. However, one bacterium cannot do any harmful or useful role inside the human body, it needs to communicate with other cells of its type first by releasing a certain type of molecules (known as autoinducer) 2. As the number of bacteria increases the concentration of that molecule increases in the environment, when the concentration of this molecule reaches a certain threshold, that can allow the bacteria to recognize how many neighbours it has. This process is known as quorum sensing 16. The process of quorum sensing can be considered as a consensus between bacteria, i.e., each bacteria vote by emitting this molecule, then the vote is counted, and after this all bacteria respond to the vote 17. Thus, the harmful bacteria when they get inside the human body, wait until their number increases, and through this specific molecule they count its population, which is when bacteria recognize that they have the right population size, make all the bacteria release their toxin in a synchronized way 17. From the chemistry point of view, the autoinducer molecule in different types of bacteria consists of two parts, the left part of this molecule in every single type of bacteria is identical, but the right part is slightly different in every single type of bacteria 2. This shows, that each species of bacteria has its own language of communication and that it uses a specific molecule which can fit into a specific receptor of bacteria from the same type 3. However, bacteria can communicate with all other types of bacteria, by having a generic molecule which can be sensed by specific receptors on all types of bacteria 17.

Anti-Quorum Sensing Nanomachines

Suppose that the model discussed in Section 2, in which n(i) nanomachines will attempt to jam the communication between bacteria through diffusing the modified autoinducer molecues (i.e. the anti-quorum sensing molecules). Further more, node_c is responsible for detecting the release of the autoinducer molecule

from the bacteria, and then triggering the other nanomachines n(i) to start diffusing the modified autoinducer to jam quorum sensing and eventually prevent bacteria from launching their attack. Consider that Q molecules are diffused by bacteria at time t into the environment with D diffusion coefficient. The molecular concentration csensed by a bacterium (or a nanomachine) at distance d at certain time t is [22]:

$$c(Q,d,t) = \frac{2Q}{(4\pi Dt)^{\frac{3}{2}}} \exp \frac{-d^2}{4Dt} \quad (3)$$

When (for example) a nanomachine releases molecules, generally the molecular concentration at any given distance gradually decreases over time. However, in the case that a nanomachine continues to emit molecules (which is what happen in quorum sensing), then the molecular concentration will keep increasing. If a nanomachine continues on diffusing molecules for a long time, the molecular concentration could approach [13]:

$$c(Q,d) = \frac{Q}{4D\pi d} \quad (4)$$

Thus, bacteria constantly release autoinducer, until reaching a certain threshold τ_{qs}. This threshold is an important parameter for activating bacteria (i.e., launching their attack, in case of considering a harmful bacteria type) in quorum sensing phase; thus, threshold τqs value could approach the maximum achievable molecular concentration $c(Q,d)$.

$$\tau_{qs} \approx c(Q,d) = \frac{Q}{4D\pi d} \quad (5)$$

Molecular concentration of autoinducer at a certain point d in the medium is the accumulated molecular concentration from the diffusion of all the bacteria N in the environment:

$$c(Q,d,N) = \sum_{i\in N} c(Q,d_i) \quad (6)$$

Where d_i is the distance between the point d and the other bacteria in the medium:

$$\sum_{i\in N} (d_i - d)^2 \quad (7)$$

Thus, bacteria will be activated when molecular concentration approaches threshold τ_{qs}, and the time needed for molecular concentration at distance d approaches τ_{qs} is:

$$t_{\tau_{qs}}(d) \approx c(Q,d,N) = \sum_{i\in N} c(Q,d_i) \quad (8)$$

Steps to Prevent Quorum Sensing

Molecular biologist Bonnie Bassler and her team [18-21] injected the harmful bacteria into a mouse and at the same time injected the modified autoinducer molecule. At this stage, the nanomachines $\boldsymbol{n(i)}$ of the defined model are deployed to diffuse the modified autoinducer.

1. $node_c$ will attempt to monitor the environment within its transmission range. If it senses molecular concentration of autoinducer greater than or equal to threshold τ, it attempts to activate the other nanomachine $n(i)$ to diffuse the modified autoinducer. The receptors of $node_c$ are assumed to be able to distinguish between the real autoinducer molecule and the modified one.

2. Thus, $node_c$ diffuses unit u of the modified autoinducer to nanomachines $n(i)$, through time slot T_0, (T_0 is less than $t_{\tau_{qs}}(d)$). $node_c$ follows the steps in Algorithm 1 to diffuse unit u.

3. The other nanomachines $n(i)$ are activated when they sense the modified autoinducer. Then, nanomachines $n(i)$ attempt to diffuse their modified autoinducer into the environment following Poisson random distribution for k time slots (i.e. kT_0).

4. Meanwhile, $node_c$ attempts to estimate $t_{\tau_{qs}}(d)$. If kT_0 is less than the estimated $t_{\tau_{qs}}(d)$, then $node_c$ diffuses the modified autoinducer molecule again after kT_0, in order to activate nanomachines $n(i)$ to activate them again.

5. Nanomachines $n(i)$ follow Poisson distribution to diffuse their modified autoinducer again for kT_0.

6. After the next kT_0 finish, $node_c$ waits for $2T_0$ and attempt to sense the molecular concentration of the real autoinducer. If it is greater than or equal to the threshold τ, then it repeats the above steps; if it is not, nod_c keeps monitoring the environment for each T_0. Figure (2) represents a simple experiment to implement the protocol steps to prevent bacteria from reaching consensus. The x-axies represents the time slot, while the y-axies indicates to the molecular concentration of both the autoinducer molecule diffused by the bacteria and the modified autoinducer diffused by $n(i)$. In this experiment the concentration of the autoinducer is increasing during the first time slots. When the autoinducer concentration reaches a certain threshold τ (in this experiment τ= 0.4), $node_c$ activates the other nanomachine $n(i)$ through diffusing unit u of the modified autoinducer. When the other nanomachines $n(i)$ diffuse the modified autoinducer, it is possible to notice that the concentration of actual autoinducer diffused by bacteria is dropping. Which indicates that quorum sensing is prevented.

CONCLUSION

In this paper, a biological process that can be considered as consensus between bacteria is discussed. This process is the key to activate bacteria to launch an attack, or to do something useful (depending on the bacteria type). Then, a network of n nanomachines are employed to perform a protocol to prevent bacteria from

reaching consensus and eventually from performing harmful activities. Experiment result shows that the concentration of the molecule which contributes in activating bacteria is decreased when the concentration of the modified version of this molecules (diffused by the $(n(i))$ nanomachines) increased in the environment. The experiment has been performed as a Matlab program and based on the protocol assumptions. The protocol steps are assumed to be in a specific transmission range of $node_c$, it is possible to assume that different networks are deployed in different positions. However, to present a more general way of preventing bacteria from launching their attacks in human body. Then the important topic of nanomachines motility needs to be explored; in order to assume that theses nanomachines are moving in different positions and are attempting to monitor the environment.

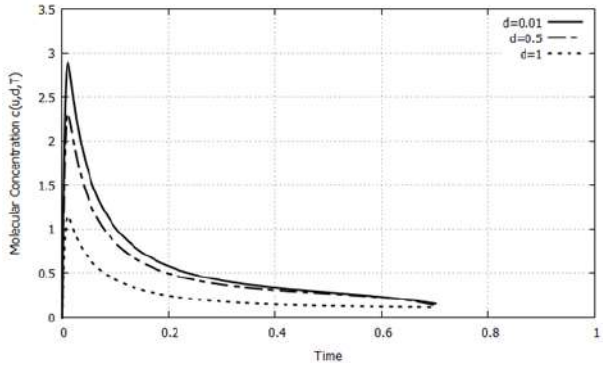

Figure 1. for different distance values

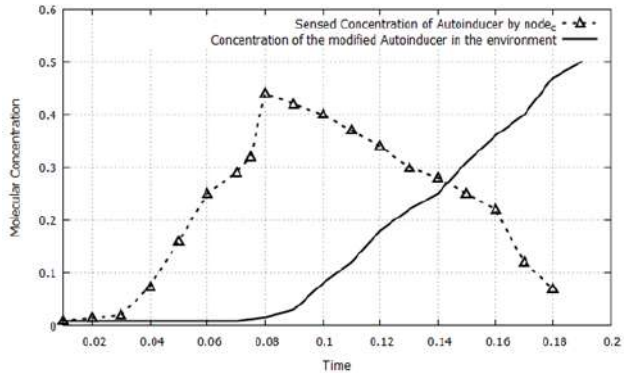

Figure 2. Experiment results after performing the above protocol steps

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Ethical Clearance

All experimental protocols were approved under the Department of Computer Science, Al-Mustansiriyah University, Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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Grading of Metabolic Syndrome Components as Premonitory Denotations for Cardiovascular Diseases

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ABSTRACT

To investigate the magnitude of inflammatory events related to metabolic syndrome (MetS) components in Iraqi men, 68 patients with this medical condition (who were diagnosed as being with MetS depending on IDF criteria 2005)[11] versus 20 apparently healthy males were enrolled in this study. Patients were divided for three subgroups depending on the number of MetS components they have. All participants were tested for their circulatory levels of certain inflammatory markers. Levels of high sensitive C-reactive protein (hs-CRP), interleukin-1β (IL-1β), tumor necrosis factor alpha (TNFα) and interleukin 6 (IL-6) were measured by using ELIZA technique. Triglyceride (TG), high density lipoprotein (HDL-c) and fasting blood sugar (FBS) were measured by using spectrophotometer. Levels of these inflammatory markers in the three subgroups of patients were as follow: hs-CRP (7667.817± 486.412 ng/ml) in group I, (6167.548± 575.558 ng/ml) in group II and (5660.655 ± 806.428 ng/ml) in group III, IL-1β (8.624±0.295, 8.240±0.422 and 7.837±0.182pg/ml), TNFα (9.307±0.219 pg/ml, 8.883±0.478 pg/ml and 8.196±0.122 pg/ml) and IL6 (11.428±2.421 pg/ml, 10.373±2.856 pg/ml and 8.452±0.507 pg/ml) respectively, which indicates that the highest clustering of MetS components induce the sturdiest inflammatory events .

Keywords: *Cardiovascular Diseases, Metabolic Syndrome, Premonitory Denotations*

INTRODUCTION

Metabolic syndrome (MetS) is generally define as a group of metabolically inter-related risk factors, including abdominal obesity, hypertension, high triglyceride (TG) levels, low high-density lipoprotein cholesterol (HDL-c) levels and high fasting blood glucose (FBG)[1,2]. It represent a common worldwide public health problem and ranging in it's prevalence from 10% to 40% [3]. Metabolic syndrome increases the risk of developing T2DM and CVD [4,5] the leading causes of morbidity and mortality in old adults [6]. The inflammatory process that may occur in those with metabolic syndrome differs from the classical inflammatory responses in certain aspects. This inflammatory events manifest itself systemically and chronically as low-intensity reaction [7]. Metabolic complications originate when intra-abdominal adipose tissue evolves into a fat storage [12]. Intra-abdominal fat is an effective endocrine organ producing adipocytokines namely Leptin, adiponectin, resistin, interleukins such as IL-1β, IL-6, TNFα and CRP [8,9].

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MATERIALS AND METHOD

Sixty eight patients with metabolic syndrome (MetS) among Iraqi men were selected randomly from different clinical laboratories, the diagnosis in each case was established by clinical examination[11]. All of them were recently diagnosed as MetS patients, and not receiving any treatments when included in this study. Their age ranged from 30 to 65 years with a mean of (48.576±1.277 years). Twenty normotensive apparently healthy men were included in this study as control group with age ranging from 30 to 65 years with a mean of (45.250±2.427years). The criteria of inclusion were cases with not less than three of the five criteria of metabolic syndrome: hypertension (HTN): a systolic blood pressure (SBP) of ≥ 130 mm Hg and a diastolic of blood pressure (DBP) ≥ 85mm Hg were considered

as cut-off level of high blood pressures, Fasting blood sugar (FBS) ≥ 100 .8 mg /dl, Fasting Triglyceride (TG) ≥ 160 mg/dl, high density lipoprotein (HDL) ≤ 39 mg /dl and waist circumference (WC) ≥ 94 cm. The criteria of exclusion included: Any condition influencing the level of cytokines and the other inflammatory biomarkers rather than the above mentioned illnesses related to MetS.

Patients were divided into three subgroups depending on the number of MetS components they have, namely group I including those with five components, group II patients with four components and group III with three MetS components. In all patients levels of high sensitive C-reactive protein (hs-CRP), interleukin-1β (IL-1β), tumor necrosis factor alpha (TNFα) and interleukin 6 (IL-6) were measured by using ELIZA technique. Triglyceride (TG), high density lipoprotein (HDL-c) and fasting blood sugar (FBS) were measured by using spectrophotometer.

RESULTS AND DISCUSSION

As central obesity is provisory according to IDF[11], and while all patients in this study were exceeding the normal limits in this regard with a mean of (119.476+_1.529 cm) , 86.7% of them were having low HDL-C with a mean of (26.205±0.997mg/dl, elevated TG encompassed 85.2% with a mean of (230.955±10.604mg/dl, high blood pressure 83.8% with a mean of (140.379±1.868 mm Hg) for SBP and (91.212±1.928 mm Hg) for DBP and elevated levels of FBS 79.4% with a mean of (171.606±7.657 mg/dl). Among the patients (36) 52.9% were with all the five components of MetS, (21)30.8% with four, and (11)16.1% of them were with three of these components. Significant differences have been deduced in the group of MetS patients represented by the salient changes in the levels of inflammatory mediators. Which is attributed to what is going on of physiopathological abnormalities related to low HDL-c, elevated TG, high BP and elevated FBS beside the well-known role of excessive accumulation of brown fatty tissues in viscera in elaborating a wide range of such mediators [10], provoking us to believe that someday abnormal central obesity may be seen as a kind of disability. Sequentially hs-CRP recorded a mean of)7428.419±476.874 ng/ml(in MetS patients compared to)2204.210±439.700 ng/ml(in control group, IL1β a mean of)8.057±0.200 pg/ml(in patients vs)6.856±0.347 pg/ml(in controls, TNF-α a mean of)8.967±0.202 pg/ml(in patients vs 7.762±0.693 pg/ml in control, IL6 a mean of)8.425±0.927 pg/ml(compared to (4.002±1.210 pg/ml) in control group. Statistically all these differences were with significant differences (P<0.05), as detailed in (table 1). What is worthy to be mentioned here patients who were with quantitate components expressed the most extensive inflammatory events reflected by the greatest elevation in levels of the aforesaid biomarkers, i.e. the highest clustering of MetS criteria, the sturdiest elevation of inflammatory markers. In minutiae the mean of hs-CRP in MetS patients who were with the five components (group I) was (7667.817± 486.412 ng/ml) , in those with 4 components (group II) was (6167.548± 575.558 ng/ml) and in those with three components (group III) was (5660.655 ± 806.428 ng/ml). Statistically these differences were significant between group I and group III (P<0.041). Group I of patients also recorded the highest values of TNFα (9.307±0.219 pg/ml) followed by group II (8.883±0.478 pg/ml) and group III (8.196±0.122 pg/ml). Again these differences were significant between group I and group III (P< 0.043). Repeatedly and in the same manner, even though with no significant differences, group I revealed the highest level of IL6 (11.428±2.421 pg/ml), follow by group II with a mean of (10.373±2.856 pg/ml) and group III (8.452±0.507 pg/ml), and to less extent IL-1β (8.624±0.295, 8.240±0.422 and 7.837±0.182pg/ml) sequentially , and as detailed in (table 2). At the time Sedentary and stressful life style with unhealthy manner of eating play roles in the development of MetS in population , the plurality of its components scaling up the magnitude of noxious mediators referred to as risk factors for CVD. Dependently, it's of convenience to diagnose MetS accompanied with the number of its components which give a clue about how violent MetS is in each patient particularly which may reflect the risk in a patient for being threatened with CVD from one side , and it enlighten the fittest way how to deal with each case particularly from the other side.

Table1. Mean of the criteria of metabolic syndrome

Measurement	**Group I** *(n=68)* **patient**	**Group II** *(n=30)* **control**	**Total** *(n=98)* **P value**
Waist circumference (cm) (Central obesity)	119.476±1.529	91.694±1.640	0.000(**H.S.**)
Systolic blood pressure mmHg	140.379±1.868	120.400±1.219	0.000 (**H.S.**)
Diastolic blood pressure mmHg	91.212±1.928	75.500±3.571	0.000 (**H.S.**)
Triglycerides mg/dl	230.955±10.604	132.050±7.863	0.000 (**H.S.**)
High density lipoprotein mg/dl	26.205±0.997	42.700±1.265	0.000 (**H.S.**)
Glucose mg/dl	171.606±7.657	84.050±1.639	0.000 (**H.S.**)

Table 2. Subgroups with metabolic syndrome

Groups	**hs-CRP ng/ml**	**TNFα pg/ml**	**Il6 pg/ml**	**Il-1β pg/ml**
Group I	7667.817±486.412	9.307±0.219	11.428±2.421	8.624±0.295
Group II	6167.548±575.558	8.883±0.478	10.373±2.856	8.24±0.422
Group III	5660.655±806.428	8.196±0.122	8.452±0.507	7.837±0.182

CONCLUSSION

Sequentially hs-CRP recorded a mean of 7428.419±476.874 ng/ml in MetS patients compared to 2204.210±439.700 ng/ml in control group, IL-1β (8.057±0.200 vs 6.856±0.347 pg/ml), TNF-α (8.967±0.202 vs 7.762±0.693 pg/ml) and IL-6 (8.425±0.927 vs 4.002±1.210 pg/ml). Levels of these inflammatory markers in the three subgroups of patients were as follow: hs-CRP (7667.817± 486.412 ng/ml) in group I, (6167.548± 575.558 ng/ml) in group II and (5660.655 ± 806.428 ng/ml) in group III, IL-1β (8.624±0.295, 8.240±0.422 and 7.837±0.182pg/ml), TNFα (9.307±0.219 pg/ml, 8.883±0.478 pg/ml and 8.196±0.122 pg/ml) and IL6 (11.428±2.421 pg/ml, 10.373±2.856 pg/ml and 8.452±0.507 pg/ml) respectively, which indicates that the highest clustering of MetS components induce the sturdiest inflammatory events .

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Biology, College of Science, Al-Mustansiriya University, Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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Synthesis and Study anti-Bacterial Activity of New Dimidazole Derivatives

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ABSTRACT

New compound was synthesized with good yields using simple methodology**.** 1,3 oxazole have been synthesized and evaluated anti-bacterial activity for some them. all derivatives were synthesized from hippuric acid (A_1) was obtained by the reaction of glucine with benzoyl chloride . oxazole derivatives (A_2-A_9) was obtained by the reaction of acetic anhydride with acetic acid then to get (A_{10}-A_{17}) react with ethylene di amine that compound was closs,or get(A_{18}-A_{26}) react with ethylene di amine less hours number, then prouduct react with chloro acetyl chloride (A26-A33) . The product compounds were characterized by FTIR and 1HNMR spectra. The results enhanced the activity of new compounds as promising antimicrobial agents and the compound had highly effect against *Staphylococcus aureus* in treatment skin infection (*in vivo*) when the healing was occur after five days compare with control.

Keyword*: Oxazole, imidazole derivatives*

INTRODUCTION

In recent years, heterocyclic compounds had been received considerable attention due to their pharmacological and pesticidal importance [1-9]. The simplest of five -membered heterocyclic compounds are pyrrole , furan and thiophene , each of which contains a single hetero atom [10]. Oxazole is the parent compound for a vast class of heterocyclic aromatic organic compounds. These are azoles with oxygen and nitrogen separated by one carbon oxazoles are a kind of attractive heterocyclic compounds because of their unique structures and varied applications [11]. The wide range of biological activities of oxazoles includes anti-inflammatory [12], analgesic [13], antibacterial and antifungal [14], hypoglycemic [15], antiproliferative [16], anti-tuberculosis [17], muscle relaxant. [18]

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MATERIALS AND METHOD

EXPERIMENTAL

Synthesis of(4-X-benzoylamino)acetic acids (A_1)

Glycine (10mmol) in 10ml of 1N sodium hydroxide was cooled at 0-5C and the cold solution was added drop wise to a solution of 10 mmol of appropriate benzoyl chlorides . The reaction mixture was continued under stirring for an additional one hour. The aqueous layer was separated and acidified with 2N hydrochloric acid. The products were collected by filtration and recrystallized from 80% ethanol as colorless needles

Synthesis of(Z)-4-benzylidene-2-phenyloxazol-5(4H)-ones (A_2-A_9)

To a stirring mixture of compound 8 (0.01 mol) acetic acid (5 ml) acetic anhydride (20 ml), aromatic aldehyde (0.01 mol) was added. Refluxed with temperature of reaction was reached to 80C° for 4hr., The mixture became almost solid, and then as the temperature rises, it gradually liquefied and turned appropriated in color. the reaction is allowed to cool. , then the mixture was poured into crushed ice and stirred for 30 min. the product was collected and recrystallized from ethanol.

Synthesis of (Z)-3-(2-aminoethyl)-5-benzylidene-2-phenyl-3,5-dihydro-4H-imidazol-4-one(A_{10}-A_{16})

To a mixture of compound (4) (0.01 mol) in (20ml) dry benzene , (0.01 mole) ethylene diamine was added. The reaction mixture was refluxed for 2 h. Then, the mixture was allowed to cool to room temperature. The product was recrystallized from ethanol to yield the desired compound

Synthesis of (E)-N-(2-(4-benzylidene-5-oxo-2-phenyl-4,5-dihydro-1H imidazol-1-yl)ethyl)-2-chloroacetamide(A_{25}-A_{31})

To solution of compound (A2) (0.006mole) in benzene (40ml) chloroacetyl chloride (0.72ml , 0.006 mole)was added drop wise the mixture was refluxed for 4h, then areaction mixture was cooled to room temperature.

Synthesis of (Z)-7-benzylidene-5-phenyl-2,7-dihydro-3H-imidazo[1,5-a] imidazole(A_{17}-A_{24})

To a mixture of compound (4) (0.01 mol) in (20ml) dry benzene , (10ml)) ethylene diamine was added. The reaction mixture was refluxed between 4-6h. Then, the mixture was allowed to cool to room temperature. The product was recrystallized from ethanol

Evaluation of antibacterial activity

The agar well-diffusion method was used to detect antibacterial activity for (22) compounds of derivatives (A_{10}-A_{31}) against various bacterial species from gram negative bacteria, *Pseudomonas aeruginosa* and *Acinetobacter baumanii* was chosen while *Staphylococcus aureus* was used as Gram positive bacteria , and *Candida albicans* (yeast) .These isolates were obtained from department of Biology/College of Science\Mustansiryih University.The concentrations for each compound were (1000) µg/ml. Plates were prepared by spreading approximately 10^5cfu/ml culture broth of each indicator bacterial isolates on Muller Hinton agar surface using sterile cotton swabs. The agar plates were left for about 15 min before aseptically dispensing the 50µl of each compound into the agar wells already bored in the agar plates. The plates were then incubated at 37°C for 18 - 24 h., Zones of inhibition were measured and recorded in millimeter diameter.The Dimethyl sulfoxide used as control.

Measurement LD50 for compound [A_{30}]

Five groups of 6 mice (4weeks old) ,weighting approximately 20 gm ,from National Center For Drug Control and Research (NCDCR), were injected intra peritoneal with 0.5ml of [A_{30}] and from each concentration from the stock (500,1000, 5000,10000) µg/ml, two mices were injected with 0.5ml normal saline and two mices were injected with dilute DMSO with water as a control .After 24 h , all mices(which injected) were examined ,and determined the concentration which was killed half of animals and consider LD_{50}

Evaluation of antibacterial activity *in vivo*

Skin infection in Rabbit with *Staphylococcus aureus* was done by contaminated the skin by bacterial suspension and the infection was monitoring and show the infection in skin . compound[A_{30}] was assayed for antibacterial activity against *S. aureus in vivo* for treatment the skin infection in Rabbit with 2.5 µg/ml /3 time daily for one week, Vaseline was used as ointment in the control group

Cell Lines used in this Study

Two types of cell lines have been used. Mammary adenocarcinoma cell line (AMN3) and fibroblastic and epithelial cells with normal chromosomal pictures (REF) as normal murine cell lines were used. Both of them are locally established in ICCMGRand they are maintained for use. The cells are cultured in RPMI1640 media contains 10% fetal bovine serum, glutamine (2 mmol/L), streptomycin (100 U/ml) and penicillin (100 U/ml), then incubated in 5% CO2 at 37ºC for 24 hour. In this time the cells will grow and become monolayer. Single cell then will use to determine the cytotoxicity of compund 30 The confluent monolayer cells treated with 1 ml of trypsin/versine to provide suspension of cells, then add 10 ml of prepared media. About 200 µl of the cells were culture on clean sterile 96- well microtiter plate then let the cells for 24 hrto make single monolayer to be ready to be treated with the compund 30.. Next day, random dilutions from immediate filtered stock test were as follows (1000, 500, 100, 75, 50, 25 and 10) µg/ml. Exposure day, decant the media from the cells and add 200 µl from test concentrations. Each concentration was triplicated and returns the microtiter plates to the incubator. Leave wells contains only cells without treatment contains serum free media representing control cells. Three different exposure times of the cells were

included in this research, 24, 48 and 72 hour.

Cell Viability Assay

The cytotoxicity was determined after each exposure time using crystal violate. Decant the tset from the microtiter plate, add 200 µl of the crystal violate to the wells of the treated cells for 20 min. in the incubator 37ºC. The crystal violate will stain the nuclei of the viable cell and the color will be visible to the eye. Then the plates were read by ELISA reader at 495nm. And then the inhibition rate was calculated using the following equation: %Growth Inhibition = (B– A)/A ×100 %

Were, A represent absorbance of control and B absorbance of sample

RESULTS AND DISCUSSION

Synthesis of all compounds were shown in scheme(1)for Synthesis of targer compounds (A_1) synthesized by the reaction of glycine in the presence of sodium hydroxide(10%) with benzoyl chloride through nucleophilic displacement mechanism (SN2) The FT-IR spectrum of compound[A_1] (Fig. 1),appearing of stretching vibrationof (OH) group of carboxylic acid at(2602-3400)cm^{-1} and appearance of new absorption band at (3344) cm^{-1} due to stretching vibration of (υNH).frequency of (C=O)acid to(1745)cm^{-1} Other IR characteristics absorption bands were listed in Table (3-1), A_1:yield (93%).m.p (186-188),color (White) , FT-IR cm-1, O-H (3335-2602), N-H(3315), (C=O)acid (1739),(C=O)amid (1600), (C=C)ar 3075, C=C aromatic (1553,1487),(C-H)alph,(2997-2883), The treatment of compound (A_1) with aryl aldehyde in presence of acetic acid and acetic anhydride lead to the formation of compounds(A_2 and A_8); A_2:yield (84%), FT-IR cm-1C=N(1645) ,C=O(1793),(C=C)ar(1599,1556),(C-H)ar (3080,3101) ,(C-H)alph (3012-2945) , C-O(1297). A_3 : yield (90%), FT-IR cm^{-1} C=N(1653) ,C=O(1795),(C=C) ar(1590,1554),(C-H)ar (3088,3144) ,(C-H) (2926-2951) , C-O(1234) ,C-Cl(692) , A_4:yield (89%), FT-IR cm^{-1}C=N(1654) ,C=O(1797),(C=C)ar(1598,1558),(C-H) ar (3103,3043) ,(C-H)alph (2897-2999) , C-O(1299). . A_5:yield (91%) , FT-IR cm^{-1} C=N(1674) ,C=O(1798), (C=C)ar(1586,1524), (C-H)ar (3018,2974) ,(C-H)alph (2895-2874) , C-O(1296) . A_6:yield (88%) , FT-IR cm^{-1}C=N(1657) ,C=O(1792),(C=C)ar(1581,1556),(C-H) ar (3150,3038) ,(C-H)alph (2940-3052) , C-O(1287) ,(C-Br)775. A_7:yield (90%), FT-IR cm^{-1}C=N(1653) ,C=O(1795),(C=C)ar(1599,1554),(C-H)ar (3072,3054) ,(C-H)alph (2843-2981) , C-O(1294) . A_8:yield (89%), FT-IR cm^{-1} C=N(1649) ,C=O(1795), (C=C) ar(1583,1554),(C-H)ar (2983,3059) ,(C-H) (2820-2905) , C-O(1292). A_9:yield (89%), FT-IR cm^{-1} C=N(1656) ,C=O(1795), (C=C)ar(1602,1558),(C-H)ar (3074) ,(C-H) (2928-3074) , C-O(1237) (O-H str.)3271. The compound from (A2-A9) react with ethylene diamine was obtained (A10-A16); The structure of compound [A_{10}] was confirmed by FT-IR and ^{1}HNMR spectrum. FT-IR spectrum of compound [A_{10}] the following bands, two bands at (3169-3132)cm^{-1} due to stretching vibrations (asymmetric and symmetric)for (NH_2)group ,while new band at (1641) cm^{-1}belongs to stretching vibration ofamide .Spectrum also shows other characteristic The ^{1}H-NMR of compound [A_{10}], the following signals:Singlet at (2.50) ppm due to (NH_2) group proton. Multiplate at (7.31-7.43) ppm due to aromatic protons. A_{10}:yield (88%) m.p (178-180),color (Light Yellow)), FT-IR cm-NH2(3252 ,3242) , (C=C)ar(1585,1523), C=N(1641 , 1604) ,C=O(1716),(C-H)ar (3107 , 3055) ,(C-H)alph (2999) C-Cl (746) ; 1H-NMR(PPM)(DMSO d), (4.189-4.259)(m, CH2CH2) , (2.504)(s,NH2), s(7.134) for(C=CH) aliphatic proton of imidazole ring , (7.317-7.388) (m ,aromatic proton) , Recy.solvent ethanol , A_{11}:yield (86%) m.p (162-164),color (wite)), FT-IR cm-NH2(3323,3269) , (C=C)ar(1595,1570), C=N(1643) ,C=O(1715),(C-H)ar (3082) ,(C-H)alph (2879-2916) .). A_{12}:yield (85%) m.p (248-250),color (Dark Yellow) , FT-IR cm-NH2(3221 , 3207) , (C=C) ar(1599,1581), C=N(1649) ,C=O(1718),(C-H)ar (3057 , 3014) ,(C-H)alph (2893-2947) other , ParaNO2 (1518 ,1342) ; 1H-NMR(PPM)(DMSO d), (3.175-3.570) (m, CH2CH2) , (2.504)(s,NH2), s(6.516) for(C=CH) aliphatic proton of imidazole ring (7.167-7.832) (m ,aromatic proton) , Recy.solvent ethanol , A_{13}:yield (84%) m.p (195-197),color (Yellow)), FT-IR cm-NH2(3213 ,3157) , (C=C)ar(1597,1581), C=N(1647) ,C=O(1714),(C-H)ar (3074 ,2976) ,(C-H)alph (2895-2929) ,C-Br (7560, A_{14}:yield (88%) m.p (256-258),color (Deep red)), FT-IR cm-NH2(3298 ,3302) , (C=C) ar(1556,1523), C=N(1600) ,C=O(1717),(C-H)ar (3084) ,(C-H)alph (2899-2929) ; 1H-NMR(PPM)(DMSO d), (4.217-4.309)(m, CH2CH2) , (2.832)(s,NH2), s(6.845) for(C=CH) aliphatic proton of imidazole ring , (7.231-7.500) (m ,aromatic proton) , Recy.solvent ethanol. A_{15}:yield (87%) m.p (180-18),color (Yelloew)), FT-IR cm-NH2(3321,3205) , (C=C)ar(1600,1581), C=N(1647) ,C=O(1714),(C-H)ar (3136 , 3030) ,(C-H)alph (2960-2997) ; 1H-NMR(PPM)(DMSO d), (4.060-4.125)

(m, CH2CH2) , (3.249)(s,NH2), s(7.357) for(C=CH) aliphatic proton of imidazole ring , (7.662-7.948) (m ,aromatic proton) , Recy.solvent ethanol . A_{16}:yield (62%) m .p (206-208),color (Brown)), FT-IR cm-NH2(3308,3227) , (C=C)ar(1599,1556), C=N(1633) ,C=O(1715),(C-H)ar (3107 , 3064) ,(C-H)alph (2955-2918) , other NO2 (1500) ,

Compounds($A_{17}$and A_{24}) were obtained by reaction Compounds($A_2$and A_9)with ethylene diamine of long time about 8h . The structure of compound [A_{17}] was confirmed by FT-IR and ^{1}HNMR spectrum. FT-IR spectrum of compound [A_{17}] shows the following bands, indicated by the disappearance of the NH_2 stretching vibration band and appearance of new stretching vibration of (C=N). new band at (1641) cm^{-1}belongs to stretching vibration of amide . The ^{1}H-NMR of compound [A_{19}], shows the following signals:Singlet at (6.82) ppm due to (C=CH) group proton. Multiplate at (7.74-8.49) ppm due to aromatic protons. - Singlet at (3.56-3.99) ppm due to (CH_2CH_2) aliphatic proton , A_{17}:,FT-IR cm-1 (C-H)ar (3032) , C=N(1641) , (C=C)ar(1593,1570), ,(C-H)alph (2916-2854) , other C-Cl(815) . , A_{18}: FT-IR cm-1 (C-H) ar (3037) , C=N(1635) , (C=C)ar(1608,1570), ,(C-H) alph (2989-2943) , other C-Br(746) . , A_{19}: FT-IR cm-1 (C-H)ar (3070) , C=N(1699) , (C=C)ar(1608,1570), ,(C-H)alph (2904-2850) , other (*Ar-NO2)* 1512,1338 s(3.56-3.99) for (CH2CH2), m(7.74-8.49) for aromatic proton, s(6.82) for (C=CH) aliphatic proton , , A_{20}: FT-IR cm-1 (C-H)ar (3051) , C=N(1660) , (C=C)ar(1587,1566), ,(C-H)alph (2928-2910) , other C-Br(705) . s(4.16-4.23) for (CH2CH2), m(7.51-7.97) for aromatic proton, s(7.35) for (C=CH) aliphatic proton . A_{21}: FT-IR cm-1 (C-H)ar (3055) , C=N(1694) , (C=C)ar(1595,1529), ,(C-H)alph (2943-2906) , other N($(CH_3)_2$) 812, s(4.18-4.25) for (CH2CH2), m(7.31-7.56) for aromatic proton, s(7.19) for (C=CH) aliphatic proton,,t (2.78-3.12)for N($(CH_3)_2$,A_{22}:FT-IR cm-1 (C-H)ar (3064) , C=N(1672) , (C=C)ar(1606,1579), ,(C-H)alph (2980-2929) , other C-Cl(759), A_{23}:yield (62%) , FT-IR cm-1 (C-H)ar (3041) , C=N(1635) , (C=C)ar(1608,1568), ,(C- H)alph (2943-2916) , other NO2(1512) , A_{24}: FT-IR cm-1 (C-H) ar (3069) , C=N(1684) , (C=C)ar(1589,1517), ,(C-H) alph (2948-2835) , other C-Br(705) *OH(2564-3456*) , s(3.17-3.57) for (CH2CH2), m(7.16-7.83) for aromatic proton, s(6.94) for (C=CH) aliphatic proton, s(9.81) for (OH) group.

Compounds (A_{25}-A_{31}) have been synthesized by treatment of compounds (A_{17} –A_{24}) with chloro acetyl chloride in dry benzene. As shown in below equation. The formation of (A_{25}) was disappearance of the by stretching vibration bands for (asymmetric and symmetric)for NH_2 group. and the appearance carbonyl amide stretching vibration bands.The product (A_{25}) was confirmed by FT-IR and ^{1}HNMR spectrum. FT-IR spectr shows band at (3032) cm^{-1} due to aromatic (C-H),bands at (1697) cm^{-1} due to(C=O) amide, band at(1597-1518) cm^{-1}due to aromatic (C=C). The ^{1}H-NMR of compound [A_{25}]shows the following signals: Singlet at (7.12) ppm due to (C=CH) group aliphatic proton. Multiplate at (7.21-7.54) ppm due aromatic proton. Singlet at (8.81) ppm due to (NH) group near(C=O).- Singlet at (4.96) ppm due to (CH_2). Multiplate at (4.18-4.26) ppm due (CH2CH2) group aliphatic proton. A_{25}: FT-IR cm^{-1};NH(3234), C=Oamide (1697) ,(C-H)ar(3032),(C-H) alph (2982,2834), (C=C)ar(1597,1518), C-Cl696, m(4.18-4.26)for (CH2CH2), s(4.96)for(CH2), m(7.21-7.54) for aromatic proton, s(7.12)for(C=CH) aliphatic proton, s(8.81) for (NH) near (C=O) , A_{26}: FT-IR cm^{-1};NH(3217), C=Oamide (1689) ,(C-H)ar(3049),(C-H) alph (2982,2852), (C=C)ar(1600,1577), C-Br 705 , A_{27}: FT-IR cm^{-1};NH(3384), C=Oamide (1696) ,(C-H) ar(3088),(C-H)alph (2970,2904), (C=C)ar(1600,1543), *(Ar-NO2)* 1502,1344 , m(4.01-4.13)for (CH2CH2), s(5.16)for(CH2), m(7.74-8.75) for aromatic proton, s(7.31)for(C=CH) aliphatic proton, s(10.12) for (NH) near (C=O) ,A_{28}: FT-IR cm^{-1};NH(3281), C=Oamide (1662) ,(C-H)ar(3186),(C-H)alph (3016,2995), (C=C) ar(1579-1539), C-Br 758 , m(3.80-4.06)for (CH2CH2), s(4.77)for(CH2), m(7.54-8.32) for aromatic proton, s(6.93)for(C=CH) aliphatic proton, s(8.70) for (NH) near (C=O) ,A_{29}: FT-IR cm^{-1};NH(3200), C=Oamide (1662) ,(C-H)ar(3086),(C-H)alph (3064,2945), (C=C)ar(1593-1527), N($(CH_3)_2$)812 m(4.11-4.21) for (CH2CH2), s(5.26)for(CH2), m(7.37-7.59) for aromatic proton, s(6.92)for(C=CH) aliphatic proton, s(10.11) for (NH) near (C=O),t(3.08-3.48) for N($(CH_3)_2$) ,A_{30}: FT-IR cm^{-1};NH(3267), C=Oamide (1670) ,(C-H) ar(3063),(C-H)alph (2926,2872), (C=C)ar(1523-1510), C-Cl 754 ,A_{31}: FT-IR cm^{-1};NH(3212), C=Oamide (1656) ,(C-H)ar(3074),(C-H)alph (2978,2938), (C=C) ar(1576-1528), NO2 1502. The *in vitro* assay of the compound against different pathogenic bacteria and yeast were achieved using 1000 µg/ml concentration as illustrated by Table **(1)**. The effect of compounds **(A_{16}-A_{31})** was evaluated against *Staphylococcus aureus* (gram positive bacteria)*, Pseudomonas aeruginosa* and *Acinetobacter baumanii* (gram negative bacteria), and

Candida albicans (yeast). Most of prepared compounds revealed a good activity against *S. aureus, P.aeruginosa, A.baumanii* and *C. albicans*. some compound shows highest inhibition activity against Gram –ve bacteria(*Pseudomonas aeruginosa* and *Acinetobacter baumanii*) ,and other had highest effect against Gram + ve bacteria (*Staphylococcus aureus*) . The compond A 23 evaluated as potent antifungal agent against yeast (*C.albicans*), (Table 1).

Table 1. The effect of (A_{16}-A_{31}) (1000) µg/ml represented by inhibition zone (mm) against different bacterial species

Comp. No	Inhibition Zone			
	Pseudomonas aeruginosa	**Acineto-bacter baumanii**	**Staphylo-coccus aureus**	***Candida albicans***
A_{10}	16	16	18	_
A_{11}	16	14	17	_
A_{12}	14	12	16	_
A_{13}	10	13	12	_
A_{14}	17	13	_	10
A_{15}	16	17	20	_
A_{16}	12	15	18	_
A_{17}	13	18	_	16
A_{18}	12	14	_	20
A_{19}	11	13	_	6
A_{20}	12	20	_	10
A_{21}	10	12	_	20
A_{22}	10	18	_	20
A_{23}	17	8	_	20
A_{24}	11	10	_	20
A_{25}	8	8	_	15
A_{26}	11	12	_	11
A_{27}	10	8	_	15
A_{28}	16	17	16	_
A_{29}	7	8	_	15
A_{30}	12	22	_	18
A_{31}	10	6	_	15

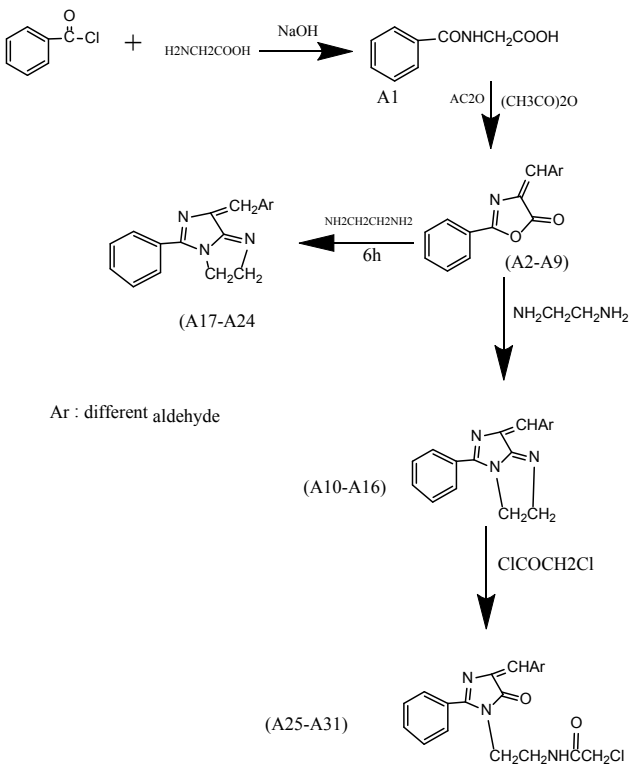

Figure 1. Synthesized of compounds (A_1-A_{31})

CONCLUSION

The results enhanced the activity of new compounds as promising antimicrobial agents and the compound had highly effect against *Staphylococcus aureus* in treatment skin infection (*in vivo*) when the healing was occur after five days compare with control.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Chemistry, College of Science, AL-Mustansiriyah University, Baghdad and all experiments were carried out in accordance with approved guidelines.

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Assessment of Risk Management Concerning Environmental Pollution Resulting from Musayyib Electricity Generation Plant in Babylon Governorate

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ABSTRACT

Objectives: To assess the risk management concerning environmental pollution resulting from the Musayyib electricity generation plant; and to identify each of extent of coordination between the concerned authorities to monitor environmental pollution and ways to counter environmental pollution. By a non- probability sample account of (150) subjects is selected for the purpose of the present study. A questionnaire as a means for data collection, it consist of two parts; include demographic data and risks management of environmental pollution which composed of (26) items. By self-administration, data are collected from those who working in the electrical generation plant and analyzed through the used descriptive and inferential statistic approach. The study results indicated that the most of the participants are within age groups (25-35) years old, and most of them is male. In regarding education, they most of them formally graduation, and administrative work, as well the subjects have no course of training. It is also, results depicts (70.7%) of the findings are disagreed that there is managed the risks concerning the environmental pollution. There is a significant association between the risks management and participants their level of education and training course at p-value <0.05.

Key words: *Assessment, Risks Management, Pollution.*

INTRODUCTION

The issue of environmental pollution is of great importance at all national, regional and global levels. So it is a major problem in many societies and to varying degrees. The environmental system in many of the planets on the surface of the earth has become the victim of environmental pollution due to social activities and non-treatment methods [1]. The view of Islam and the preservation of a comprehensive view that included all the contents of the environment that the preservation of water, air and all the contents of the environment and decided to live in a clean environment free of pollutants [2]. Pollution is a dependent or spontaneous change in the form of the environment resulting from human waste or change of the natural environment in a way that carries with it dangers to the living organism [3]. The most critical fact to electric plant sources that they are considered renewable and own high environmental foot-print, at the levels in which they were practiced [4]. In facts some electricity generations are the increase of population, change in over-all human culture, industry transport, consumption of buildings and industrial and needs for commercial. In 2009, "fossil fuel accounted for (80) percent of electricity production in the world". Nuclear, coal and natural fuel constituted for about (8%, 23%) also (24%) out total energy consumed in the U.S., respectively "Atlantic Council of United States, 2010". The used primarily of coal, for producing almost (50%) of electricity and natural gas is used to produce almost (18%) of United State electricity [5]. Impacts of electricity generations related to many issues of environmental, it is own generated consider arguments that have taken many dimensions; some argue that it has resulting in increased degradation of the environment while others argue that it

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has contributed to credibility of environmental conditions by used renewable power sources. Very efforts are exciting have been made by many industries to reduce the negative environmental effects as a results of electricity generations e.g. the effort made by electricity generating companies to reduce air pollutions has been facilitated by the development of nuclear energy. There have been various comparisons in the performance of many cycles of fuel by different electricity generating companies with the aim of estimating their environmental impacts conditions and how they may be able to contribute to the circumstances of the environment [6]. The phenomenon of environmental pollution has become a real phenomenon that threatens the health of the environment and its environment as a living organism, as a result of the increase in human activities, which led to a significant increase in the percentage of environmental pollutants from the maximum limits allowed globally [7]. Mans is also one of the main sources of environmental pollution in its various activities, industrial, commercial, agricultural and recreational, which lead to pollution of the environment, and it is clear that humans are more dangerous to the environment than natural factors. Man's destroys an environment in his hand, thus awakening his life and the life of others on the surface of this planet [8]. The most important sources of human environmental pollution are the power plants, especially those stations which operate on fuel, it is known that the most important air pollutants to cities are the facilities of generation and conversion of electricity, followed by the sectors of clean industries and primary industries, all contribute to pollution [9]. The types of pollution vary according to the methods to which they are classified. If some types of pollution are caused by natural factors such as volcanoes, earthquakes, floods and storms. This pollution is achieved by nature itself. Environmental pollution caused by people's activities can be called human environmental pollution [10].

METHODOLOGY

A Study Objectives:

To assess the risk management concerning environmental pollution resulting from the Musayyib electricity generation plant.

To identify the extent of coordination between the concerned authorities to monitor environmental pollution resulting from the Musayyib electricity generation plant.

To identify ways to counter environmental pollution resulting from the Musayyib electricity generation plant.

To find out relationship between the demographic characteristics of workers and aspect of environmental pollution, monitor environmental pollution, and ways to counter environmental pollution.

Study Design: A descriptive study, using assessment approach, is carried out to assess the risk management concerning environmental pollution resulting from Musayyib electricity generation station in Babylon Governorate. A non-probability simple random account of (150) workers at generation station. A questionnaire as a means of data collection was constructed for the purpose of study. It consisted from two parts, include:

Part I: This part contains demographical data which include (age, gender, education level, nature of work, and training course).

Part II: This part is composed of (26) item and divided into (3) sections. They include: aspects of environmental pollution which composed of (8) items, coordination between the authorities concerned with monitoring the environmental pollution which composed of (8) items, and ways to counter environmental pollution which composed of (10) items.

Data analysis: Through the used descriptive statistical (SPSS) version XX analysis approach that includes, frequencies, percentages, mean of scores, standard divagation and graphical presentation of data; and inferential statistical data analysis approach that include Chi-squared test.

RESULTS AND DISCUSSION

Results represents the distribution of the workers demographic items in term of frequencies and percentage. Findings reveals that the (48%) are within first age groups (25-35) years old. Regarding gender, the greatest percentages is male, it constituted (74%) out total number of the study sample. Regarding education, most of the study sample are preparatory, it constituted (45.3%). It is obvious that the most of the study sample are administrative work and account (74.7%) out total number. Finally, results indicate that the (40.7%) of workers are no training course. The findings that based on the statistical cut off point. The aspects of environmental pollution resulting from Musayyib electricity generation station was calculated

as frequencies, percentages, arithmetic mean and standard deviation. Results depicts that the (82.7%) they agree that there is environmental pollution. In assessing coordination between the authorities concerned with monitoring the environmental pollution. Results reveals a majority of (68.7%) of the study findings are indicate disagree that there is coordination between the authorities. Regarding assessing ways to counter environmental pollution. The majority of (54.7%) out total of the sample findings are neutral to counter the environmental pollution. Results presents the association between risks management concerning environmental pollution and workers demographic characteristics. It reveals that there is a non-significant association with their characteristics at p-value (> 0.05) except, with their level of education and training course, there is a significant association with the management of risks that concerning environmental pollution at p-value (< 0.0.5). In regard to the characteristics of the samples relative to the present study. Results represents the distribution of the workers demographic items in term of frequencies and percentage. Findings reveals that the (48%) are within first age groups (25-35) years old. Older people can judge things better. Regarding gender, the greatest percentages is male. Women have many duties, as the duties of the house, the researchers find a few number. Regarding education, most of the study sample are preparatory. There are a lot of scientific levels specialized in the field of electrophoresis but due to the financial crises and inappropriate circumstances that are exposed to the country, revision found a few scientific levels that work in the station in terms of scientific progress (certificate). It is obvious that the most of the study sample are administrative work. Due to the lack of work in the field, many workers want administrative work because the field work is tired and no allocations were made due to the country's conditions. In regard the training course, results shown there were no training course. The worker does not want the training courses because they are expensive and the reason is due to the financial allocations, the supporting bodies and the monitoring bodies. The aspects of environmental pollution resulting from Musayyib electricity generation station. Results depicts that the available of environmental pollution. This is evidenced that there are many oils and gases that undergo in a process of electrical generation power, and versus the abundance of smells and the presence of many gases, including nitrogen and hydrogen peroxide and other for the lack of tools or standards for air spills, it is also not available the equipment to measure the level of noise within the stations, and is not equipped with modern technical equipment for air. The study has been investigated the environmental effect due to power plans. Their findings confirm that the plants of generations have been affected the environmental purity of the surrounding region very badly. Environmental deterioration is attributed to emission of large cases of respiratory and related ailments to human beings and animal kingdom. It also impacts of process concerning with photosynthesis, balance of minerals and micro-macro nutrients in the plants, soil strata, structures and buildings get affected due to corrosive reactions, especially for workers and residents near the station [11]. In regard to coordination between the authorities concerned with monitoring the environmental pollution. Disagree to coordination between the authorities. As being the number of environmental monitors in the company is not commensurate with their functional tasks as well as the non-periodic exchange of reports on the state of environmental pollution resulting from the stations and with others stations, or rather the lack of cooperation of companies concerned with the protection of the environment to reduce the effects of environmental pollution caused by stations, as in general the lack of the of surveillance system and lack of adequate and advanced environmental protection systems. Furthermore, a study that has been assessed the environmental impacts of the thermal power plant in Bangladesh. Their results it is confirm the generation of electricity and consumption of energy in general, adverse effects on the environment, and the major environmental impact is thermal power plant [13]. Results presents the association between risks management concerning environmental pollution and workers demographic characteristics. It reveals that there is a non-significant association with their characteristics at p-value (> 0.05) except, with their level of education and training course, there is a significant association with the management of risks that concerning environmental pollution at p-value (< 0.0.5). that higher education owners are more aware of the management pollution caused by the station. That most of the sample are graduates of institutes so they carry out executive functions. As for the nature of the work, the members of the sample are administrators, they perform the tasks of supervision. With regard to training courses, the increase in the number of training courses increases the knowledge of the workers at work. This results come with the results that investigated the

environmental pollution caused by power plants and its impact on environmental security. Their findings depicts that there is a significant association with the workers level of education at p-value less than (0.01). The result was higher education increasing the degree of education increased the worker's knowledge of protection and management of prevention of pollution [1].

Table 1. Sample characteristics

Demographic data	Rating	No.	%
Age (years)	25-35	72	48.0
	36-46	46	30.7
	47-57	26	17.3
	58+	6	4.0
Gender	Male	111	74.0
	Female	39	26.0
Education	Preparatory	68	45.3
	Institute	29	19.3
	Bachelors	41	27.3
	Post-graduate	12	8.0
Nature of Work	Administrative Work	112	74.7
	Field Work	38	25.3
No. Training Course	No training	61	40.7
	One Course	54	36.0
	Two Course	23	15.3
	Three and more	12	8.0

Table 2. Overall Domains

Domains	Rating	No.	%	M.S.	S.d.	Assessment
Aspects of Environmental Pollution	Disagree	6	4.0	2.78	0.49	Agree
	Neutral	20	13.3			
	Agree	124	82.7			
Coordination between the Authorities Concerned with Monitoring the Environmental Pollution	Disagree	103	68.7	1.39	0.63	Disagree
	Neutral	35	23.3			
	Agree	12	8.0			
Ways to Counter Environmental Pollution	Disagree	82	54.7	1.55	0.66	Neutral
	Neutral	54	36.0			
	Agree	14	9.3			

Table 3. Statistical Association between Overall Risks Management Concerning Environmental Pollution and Workers their Demographic Characteristics

Demographic Data	Rating	Overall Assessment			obs.	d.f	crit.
		Disagree	Neutral	Agree			
Age (years)	25-35	50	22	0	2.442	6	12.592
	36-46	30	16	0			
	47-57	26	0	0			
	58+	0	0	6			
	P-value= 0.875 → NS						
Gender	Male	70	35	6	0.813	2	5.991
	Female	36	3	0			
	P-value= 0.666 → NS						
Education	Preparatory	49	13	6	13.471	6	12.592
	Institute	18	11	0			
	Bachelor	31	10	0			
	Post-graduate	8	4	0			
	P-value= 0.040 → S						
Nature of Work	Management Work	80	26	6	2.865	2	5.991
	Field Work	26	12	0			
	P-value= 0.320 → NS						
No. of training Course	No training	43	18	0	18.272	6	12.592
	One Course	33	15	6			
	Two Course	22	1	0			
	Three and more	8	4	0			
	P-value= 0.006 → S						

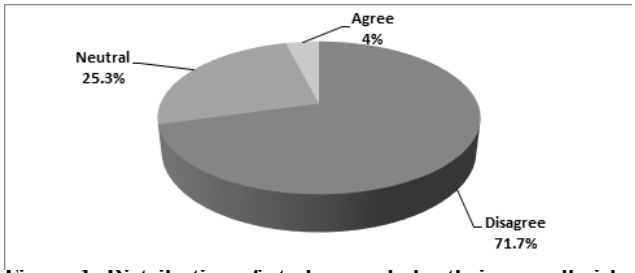

Figure 1. Distribution of study sample by their overall risks management concerning environmental pollution. Results depicts that the majority of (71.7%) out total number are disagree that there is found risks management concerning environmental pollution.

CONCLUSIONS

Study concludes that more than half of the participants are disagree that there is found risks management concerned with the environmental pollution. As well as the participants level of education and training course have been influenced their management.

Financial disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Environmental Studies, Biology, Ministry of Education- Iraq and all experiments were carried out in accordance with approved guidelines.

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Effect of Strategy within and Outside the Circle in the Achievement of Students in the Fifth Grade in Social Studies

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ABSTRACT

The objective of the research is to identify the impact of a strategy within and outside the circle in the achievement of the fifth grade pupils in social subjects, The researcher followed the method of experimental research to achieve the objectives of the research, which includes an independent variable (strategy within and outside the circle, the usual method), And a dependent variable(educational attainment)The researcher adopted the experimental design with a partial control to adjust the search variables The sample of the study was selected Safad Primary School for Boys for the academic year (2017-2018) The sample consisted of (60) students and chose (a) randomly to represent the experimental group by (30) students and (b) to represent the control group and the number of (30) Before the experiment was applied, the researcher was rewarded between the two research groups for the purpose of obtaining accurate and objective results with the following variables: (Father's education, Mother's education, IQ test, the age of time calculated in months, the previous knowledge). The researcher prepared an achievement test consisting of (40) objective paragraphs of choice type, the researcher obtained data for the experimental group and control.

Keywords: *Education, curriculum, methods and strategies, social materials, active learning, strategy within and outside the circle, collection.*

INTRODUCTION

Contemporary human societies are witnessing an explosion of knowledge which resulted in a scientific and technological revolution, and resulted in many rapid changes and developments in successive areas of humanitarian activities, hence, human societies are making great efforts to employ this information revolution to allow their members to benefit from the knowledge they possess. The only way to keep abreast of these developments is through education and its curricula [1] Active learning is the way a student engages in various classroom activities rather than being a passive individual who receives information from others Active learning encourages student involvement in interaction by working in discussion groups, And participate in the discovery of concepts and exercises based on problem solving, allowing them to participate in activities and lead to the acquisition of concepts and skills of creative thinking and investigation and problem solving, and encourages them to make decisions [2] . Modern education has attached great importance to the teaching methods and strategies of active learning and considered it as the cornerstone of the teaching process because of its distinctive role in achieving its objectives And have a clear influence in the attitudes of students, and their attitudes towards the material, and depends on the success of the teacher [3] . The new strategies of active learning were characterized by shifting the focus of attention in the educational process of the teacher and his role in teaching the material to the learner and his active role in learning the material to be the focus of the educational process, And make learning linked to the abilities of the students and their readiness and abilities and their interaction with each other [4]. Recent strategies allow learners to work together, play an active positive role and interact with different attitudes to collect facts themselves, It also increases the effectiveness of learning, The studies conducted in this field also emphasized

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the importance of modern strategies in increasing the achievement of learners and the high rate of achievement in materials, And to increase understanding and social and personal relations between learners [5]. The social materials have a prominent place in the school curricula because they have a significant impact and effect on the generation generation culturally, scientifically and professionally and to make them useful members of their society and their nation and for all humanity, It helps to understand the learners of the problems surrounding them and their community and their nation to contribute to the development of solutions and proposals for understanding [6] History is one of the social items that focus on the past in its events, And his ideas, to show the extent to which this past can affect the present man lives [7].

Strategy within and outside the circle:

Strategy within and outside the circle This strategy is based on the ability of students to generate questions and prediction, Brainstorming and cooperative education, This strategy stimulates students' motivation through their ability to answer questions themselves, And not feeling embarrassed because he knows that there are others who read him do not know some information [8]. A strategic idea inside and outside the circle is to exchange ideas for a specific purpose or purpose, Where the class is divided into two teams Each team is divided into two groups So that the two groups form an internal department and an external department And meet face to face and start the students of the internal group to ask questions to the students of the external group, Then the students of the outside group move clockwise until the team completes the entire cycle, The aim is to help students acquire the skills of asking questions, predicting, Speak quietly, Move for a goal, The strategy can be implemented at the end of the lesson after the teacher has finished explaining and evaluating the lesson. It is the framework of knowledge and skills gained through the subjects taught, School achievement plays a major role in shaping the learning process, And the achievement of the school on its importance is the only variable in the process of learning because the collection process is complex and influenced by many factors such as the teacher and his abilities, And its aptitudes, moods, health, educational experience and methods of education and this is one of the factors.

METHODOLOGY

First: experimental design of the research

It includes one independent variable (Strategy within and outside the circle) and a dependent variable (Collection) so the researcher used the experimental design With partial settings For the experimental group and the control.

Second: the research community and sample:

1- Research community:

This research community consisted of fifth graders in elementary schools for boys in Babil governorate for the academic year 2017-2018.

2. Research Sample:

In order to select the sample of schools the General Directorate for the Education of Babylon was chosen The researcher chose Safad Primary School to conduct the experiment The sample consisted of two students of the fifth grade of the primary school (66) students divided into two divisions (A, B) (A) to represent the experimental group and (b) to represent the control group. After the exclusion of the students in the two groups (A and B) the total number was (60) students by 30 students in both the experimental and control groups. The equivalence of the two research groups: The researcher aimed to statistically equalize the research groups statistically in some variables that affect the results of the experiment and keen to adjust the following variables:(Father's education, Mother's education, IQ test, the age of time calculated in months, the previous knowledge).

1- Father's education

The researcher obtained the data on the collection of the parents through the school card. It was found that the two groups were statistically equivalent in this variable The results of the data showed that the value of the calculated ka (0.802) is smaller than the ka 2 value (7,815) (0,05) and to a degree of freedom (3) Table 1.

RESULTS AND DISCUSSION

Mother's education

The researcher obtained the data on the collection of mothers through the school card. It was found that the

two groups were statistically equivalent in this variable. The results of the data showed that the value of Ka2 is(2.467) smaller than the value of the ka2 in the table at (7,815),(0,05) and to a degree of freedom (3), and this is illustrated in the following table 2.

IQ test:

After the researcher applied the test to the two groups of research (experimental and control) The average scores of the experimental group (18.13) and the deviation (5.04) were the mean of the students of the control group (16.83) and the deviation (4.79)When the(t-test) was used for two independent samples To find out the difference between the mean scores of the two groups in the IQ test. The results showed that the differences were not significant at 0.05 and with the degree of freedom (58), the calculated T value (1.024) was smaller than the numerical value of (2,000) in this variable, the following table shows Table (3).

The chronological life calculated by months:

According to the researcher, the average age of the students was (129.6) months, while the mean of the control group was (130.27) The independent T test was (0.501) which is smaller than the T- With a degree of freedom (58) The two research groups are shown to be equal in the age variable and the following table shows Table 4.

Students' grades in social subjects for the previous academic year: The researcher The average score of the experimental group was (64.43) with a standard deviation of (15.99) while the average score of the control group was (63.8) with a standard deviation (19.5) and after the use of the T test (t-test) for two independent samples to determine the significance of the difference in grades It was found that the difference was not statistically significant at (0,05) The calculated T value (0.138) is smaller than the numerical value (2.000) Indicates the equivalence of the two search groups in this variable, and the following table illustrates this Table (5). Excellence Students of the experimental group who studied on According to a strategy inside and outside the circle On pupils Control group Who studied according to the usual method in the achievement test Thus rejecting the first zero hypothesis AND Accept Zero hypothesis Alternative : (There is a difference of statistical significance at the level of significance (0.05) Between the average scores of the experimental group Which are studying In accordance with the strategy inside and outside the circle And the average score of students in the control group Who are studying According to the normal method In the test of collection of social subjects For the fifth grade primary) And this is consistent with the studies that confirmed the superiority of the experimental group, which was studied according to a strategy within and outside the circle on the control group, which was studied according to the usual method as a study.

Table 1. Kay box results for the two sets of research in the educational achievement of parents

Level of significance (0.05)	Degree of freedom	Values (Ka 2)		College and above	Preparatory and Institute	Medium	Reads, writes and initials	Number of sample members	the group
		Table	Calculated						
Non-D	3	7.815	0.802	6	9	7	8	30	Experimental
				7	6	8	9	30	Control

Table 2. Kay box results for the two groups of research on the educational achievement of mothers

Level of significance (0.05)	Degree of freedom	Values (Ka 2)		College and above	Preparatory and Institute	Medium	Reads, writes and initials	Number of sample members	the group
		Table	Calculated						
Non-D	3	7.815	0.467	8	6	9	7	30	Experimental
				5	8	6	11	30	Control

Table 3. The arithmetical mean, variance, and T calculated and tabular value of the students of the two groups in the IQ

Level of significance (0.05)	**T value**		**Degree of freedom**	**standard deviation**	**Arithmetic Average**	**Number of sample members**	**the group**
	Table	**Calculated**					
Not statistically significant	2.000	1.024	58	5.04	18.13	30	Experimental
				4.79	16.83	30	Control

Table 4. The arithmetic mean, standard deviation, variance, and T calculated and tabular value of the students of the experimental and control groups in the mean age are calculated in Months

Statistical significance	**T value**		**Degree of freedom**	**standard deviation**	**Arithmetic Average**	**Number of sample members**	**the group**
	Table	**Calculated**					
Not a function at level 0.05	2.000	0.501	58	5.34	129.6	30	Experimental
				4.96	130.27	30	Control

Table 5. Arithmetical mean, standard deviation, and T calculated and tabular value in the half-year variable for social subjects

Statistical significance	T value		Degree of freedom	standard deviation	Arithmetic Average	Number of sample members	The group
	Table	Calculated					
Not a function at level 0,05	2.00	0.138	58	15.99	64.43	30	Experimental
				19.5	63.8	30	Control

Table 6. Calculate the experimental and control group scores in the test

Level of significance (0,05)	T value		Degree of freedom	standard deviation	Arithmetic Average	Sample size	the group
	Table	Calculated					
Statistical function	2.000	3.067	58	5.12	28.33	30	Experimental
				7.25	23.37	30	Control

CONCLUSION

The researcher was rewarded between the two research groups for the purpose of obtaining accurate and objective results with the following variables: (Father's education, Mother's education, IQ test, the age of time calculated in months, the previous knowledge). The researcher prepared an achievement test consisting of (40) objective paragraphs of choice type, the researcher obtained data for the experimental group and control.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Basic Education, University of Babylon, Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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Occurrence, and Preventive Measures of Injuries by Needles and Sharp Objects in Governmental Hospitals, (AL- Amara City, Iraq)

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ABSTRACT

Objectives: 1. to investigate the occurrence and frequency of injuries by needles and sharp objects among health care workers in in AL- Amara city, Iraq , 2. to identify the factors that may contribute to these injuries, 3. to explore preventive measures and intervention to deal with these injuries. A descriptive exploratory survey was conducted in Al-Amarah city hospitals during the period from January 2018 to May 2018. It was use of non-probability sample (purposive) of 135 health care workers , the data was collected throw the interview technique by using of constructed questionnaires, which consist of 3 parts. The result showed that most of health care workers in the sample are exposed to needle stick or sharp injury in the last 12 month, 108 participants out of 135 reported they have been needle stick and sharp injuries (80%) , the majority of incidence occurred by syringe needle (46.3%). Most of injuries occur during use the needle or sharp injuries (n= 37 , 34.3%) .The majority of (NSI) happened during normal injection procedure (n= 36,33.3%) . The main causes of injuries was workload (n=76, 70.4%).

Keyword: *Injuries, Needles and Sharp, Preventive*

INTRODUCTION

Injuries because needles or sharp objects considered the most important work risks [1]. It is a dangerous phenomenon where statistics estimate that there are three million health care workers exposed to blood carrying an infection source every year [2]. Globally, these injuries caused 16,000 hepatitis C, 66,000 hepatitis B, and 200 to 5000 human immunodeficiency virus (HIV) infections per year. More than 90% of these infections are occurring in Third world countries, and most are preventable [2, 3]. There are studies report the risks of occupational blood-borne viruses (BBV) infection for HCWs in developed countries where a range of prevention measures have been applied. In contrast, the condition for HCWs in Third world countries is not well registered, and their safety is neglected issue [3]. It is worth mentioning that More than two thirds of health care workers have contact with blood or body fluids throughout their working lives [4]. Based on study the cost of one injury without infection about three thousand dollars [5]. The case of infection caused by injury reach one million dollars or more spend in tests, follow-up, lost time and disability payments. Liver transplantation due to hepatitis C costs hundreds of thousands of dollars. Other costs of injuries include worker reparations, overtime, and expenses related to the recruitment and training of staff to replace the worker who is sick [5]. While there are no financial accounts for citation here, there should be a cost applied to replace nurses and other health care workers who have chosen to leave the care environment because of concerns about needle sticks [1]. Programs and studies carried out by the International Council of Nursing and the World Health Organization on the prevention of injuries by needles and exposure to blood borne infection concluded the need to work on the

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use of safety tools for medical interventions, as well as the training on general precautions which have proved effective for the prevention of over 80% of injuries will assure that nurses can continue to provide quality patient care [6]. About 62% - 88% of injuries are preventable [3]. The world is suffering from a lack of healthcare workers, especially nurses, in the United States, for example in USA the nursing shortage may reach 800,000 vacant positions by 2020 [2]. There is a lot of suffering after the injury may be physical, psychological or emotional to the injured person and waiting for the result of lab tests after the injury lead to emotional disorder [(2)]. Moreover there is devastating need for nursing and medical services in Iraq. Nurses shortage especially academic nurse is an important issue in AL-Amara city, Iraq, thus there is an urgent need for the development of policies to prevent injuries to maintain nursing staff, technicians and physicians. In study conducted in Baquba City , Iraq to explore prevalence of needle stick and sharp objects injuries among 240 Health Care Workers (HCW), study suggested 46.6% injuries among physicians and 18.7% injuries among nurses [7.] This study would provide information to the policy makers in regard to the frequency of injuries, the sources of these incidents, action taken to prevent, and the factors contributing to these incidents. Policy makers can use these data to develop further measures and policies that would help in creating a safe workplace that could be free or with minimal occurrence.

MATERIALS AND METHOD

A descriptive exploratory survey in injuries by needles and sharp objects among health care workers in AL-Amara city, Iraq 2018. Non probability Purposive sample of 135healthcare workers 32 Physicians, 23 lab technicians and70 nurses was selected for the study, which consists of three parts. Part (1), demographic data form, It is compressed of eight item which are concerned with the healthcare workers demographic characteristics of healthcare workers age, gender, educational level of healthcare workers, number of experience years, job title, place of the work and number of training courses on the risk of injuries by needles and sharp objects among healthcare worker and part (2), Occurrence and contributing factors . Included 5 items all questions are multiple choice Part (3) Preventive measures included 7 items all questions are yes or no. The content validity of the study instrument was determined by presenting it to a panel of 12 experts both from the academia and its reliability was A back translation was made by two linguist to back translate the study instrument to its original language; English language. There was no remarkable mismatching between the version translated to Arabic language and the original version in English language. Data were analyzed through the use of simple descriptive statistical data analysis approach (frequency, percentage, mean of score) and inferential analysis procedures (chi-Square) were used for the data analysis.

RESULTS AND DISCUSSION

The results of table (1) show that the majority of age group of the study sample are within (25-29) years (34.8%). The above table also shows that the majority of participants are male (56%). Concerning the years of experience , half of participants who are in the group (1-5) years (50.4%) , Regarding educational qualification , more than one third of participants are bachelor's degree(35.6%) ,About job title more than half of participants are nurses (59%) , With respect to current area working more than one fifth that work in the Operation Room (22.2%). A training course (NSI) approximately half of participants are in the none training course (48.9%), About hospitals samples distributed equally among three hospitals ; Al-Sadr , Al-Zahrawi , and Missan pediatric hospital (n=45; 33.3%). Table (2) presents a description of the participant's experience of needle and sharp objects injuries such as frequency of injuries and Type of needle and sharp objects, Time of occurrence, Procedures, and main causes. 108 participants out of 135 reported they have been injuries (80%) , the majority of incidence occurred by syringe needle (46.3%). Most of injuries occur during use the needle or sharp injuries (n= 37 , 34.3%) .The majority of injuries happened during normal injection procedure (n= 36,33.3%) . The main causes of injuries was workload (n=76, 70.4%). Table (3) a description of the preventive measures related to injuries that taken by health care workers to prevent infections. The majority of health care worker that injured with needles and sharp objects had been disinfect the area with an alcohol swab post exposure (N= 105 , 97.2%) , followed by those who had been taken hepatitis B vaccine pre exposure (N= 82, 75.9%) , those who had been wear gloves during injury (N=82, 75.9%) , those who had been allow injury to bleed (n=65, 60.2%) , those who received NSI package (lab tests) after injury (n=42, 38.9%) , those who had been Notify manager or supervisor of the exposure (n=40,37%) . those who had been Wash injury with soap and water(n=31, 28.7%).

According to the result in table 2 the occurrence rate of NSIs is 80%, this result is agreed by study done by Amini (90%). [8]. Our research showed the most common sharp tools use was syringe needle 46.3% and it's similar to the study obtain by Mitchell in 2015 who found that syringe needle53% was the most common used objects [9]. the majority of injuries time occur during the use of the needle or sharp objects (34.3%) similar to the result obtain by Mitchell which was (33.0%) [9] . Our study showed that the most common procedure were normal injections (33.3%) table 2. This result inconsistent with Abu-Rmeileh 2012 who find the wound suturing is the most common (33.5%) [10]. Based on this study the main cause of injuries was workload 70.4% table 2. This result disagree with study done by Aderaw in 2013 which showed that lack of sleep and tiredness were the major causes of injuries [11]. The prevalence of injuries by needles and sharp objects among health care workers, especially under the current circumstances of increased traumatic injuries, psychological disturbance and economic distress, will be higher than that of neighboring countries such as KSA and Jordan, despite of the fact that they are also developing countries as well Furthermore large one setting investigated were teaching hospital where lower experience may play a major role in the incidence of needle stick injuries. In this study most of health care workers had vaccinated against hepatitis B 75.9 % table 3. This similar to study done by wicker S. in 2007 who found that 78.2%take the vaccine [12] and also ascertained Ebrahimi in 2007 [13] . The health care workers allow the injury to bleed without making pressure 60.2% table3. This result agree with study done by Jahangiry in 2016 who find that 99% allow the injury to bleed. but didn't wash injury with soap and running water 71.3% table 3. This result disagree with result obtain from study done by Jahangiry in 2016 who find that 75% wash injury with soap and running water; (37.0%) from injured health care workers notify manager or supervisor of the exposure table 3. This result agree with study obtain by Kanlee in 2005 showed 40.8 % [(15)]. The largest proportion of health care workers were wearing gloves (75.9%) table 3. This result agree with study done Jahangiry M. 2016 who find that (70.4%) HCWs wear gloves [14]. Finally the highest number of health care worker did not made lab test after injury (61.8%) table1.and this disagree with study done by Kommogldmo in 2016. It is important to mention that the Iraqi health regimen is different from other countries , there is no clear policy to establish basic rules to prevent needle stick injuries and sharp objects to protect the health care workers

Table 1. Socio-demographic and job characteristics of respondents

Variables	Frequency	Percent
Age		
20-24	23	17.0
25-29	47	34.8
30-34	20	14.8
35-39	25	18.5
40-44	11	8.1
45-49	6	4.4
50-54	3	2.2
Gender		
Male	76	56.3
Female	59	43.7
Years of Experience		
1-5	68	50.4
6-10	22	16.3
11-15	27	20.0
16-20	12	8.9
21-25	4	3.0
26-30	2	1.5
Basic Educational		
High school	26	19.3
Associate degree	44	32.6
Bachelor's degree	48	35.6
Master's degree	4	3.0
Doctorate degree	13	9.6
Job title		
Physician	32	23.7
Nurse	80	59.3
Technician	23	17.0

Table 2. Occurrence, and Distribution of respondents by injuries, type of needle, time of occurrence, procedure, and main cause

Variables	frequency	percentage
Occurrence	108	80
Type of needle , and sharp objects Syringe needle Intravenous catheter Suturing needle Scalpels and scissors Ampoules Others	 50 7 23 4 17 7	 46.3 6.5 21.3 3.7 15.7 6.5
Time of occurrence Opening the needle or sharp objects During use the needle or sharp objects Recapping Break the ampoule While putting the item into the disposal container After use and before disposal of the tool	 7 37 34 17 4 9	 6.5 34.3 31.5 15.7 3.7 8.3
Procedures Normal injection Suturing Blood collection Incision and cut Others	 36 32 22 15 3	 33.3 29.6 20.4 13.9 2.8
Main cause workload Inappropriate training Handling uncooperative patient Tired and lack of sleep Busy and not attention	 76 9 13 6 4	 70.4 8.3 12.0 5.6 3.7
Total	108	100

Table 3. PREVENTIVE MEASURES

Variables	frequency	percentage
Vaccinated for hepatitis B. Yes No	 82 26	 75.9 24.1
Allow injury to bleed. Yes No	 65 43	 60.2 39.8
Wash injury with soap and water. Yes No	 31 77	 28.7 71.3
Disinfect the area with an alcohol Swab. Yes No	 105 3	 97.2 2.8
Notify your manager or supervisor of the exposure. Yes No	 40 68	 37.0 63.0
Did you wearing gloves during injury Yes No	 82 25	 75.9 23.1
Have you done lab tests after injury (Receive NSI Package) . Yes No	 42 66	 38.9 61.1
Total	108	100

CONCLUSION

The majority of health care workers are exposed to NSI and sharp objects (80%). Some factors play an effective role in NSIs while others have methods to prevent them. Therefore, the recommendations in research, education, practical application and policy regulations are necessary and urgent to be applied to reduce injuries and create a healthy working environment.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing/ University of Misan, Iraq and all experiments were carried out in accordance with approved guidelines.

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Assessment of the Patients' Knowledge about their Disease for Rheumatoid arthritis at Baghdad Teaching Hospital

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ABSTRACT

The aim of the study was to identify the patients' needs to educational program in the context of their health problems, as expressed in their subjective assessment. A descriptive study design was carried out in the Outpatient Clinics for Rheumatology at AL- Yarmouk Teaching Hospital, from April to May 2018. A non –probability (purposive) sample was selected and composed of (40) adult (male and female) patients with rheumatoid arthritis who attend to Outpatient Clinics for Rheumatology. There were 40 patients included in the study. The mean age of the participants was (41.30 ± 9.90) years. Of the 40 respondents, the largest age category was of those between 40-49 years (35%). There were 27 (67.5%) females and 13 (32.5%) males The mean of disease duration was 21 (52.5%) years. The results of the assessing show the level of knowledge about disease of patients with RA is very low. Therefore, the results show the need for education programs about exercise, diet, relaxation technique and information about their disease. There was no significant relationship between patients' knowledge domains and clinical characteristics, in addition there were no significant relationship between patients' knowledge domains and social-demographic characteristics at $p \geq 0.01$ value.

Keywords: *Rheumatoid arthritis, RA, awareness; education.*

INTRODUCTION

Rheumatoid Arthritis (RA) is one of the most important chronic inflammatory diseases affecting the joints and musculoskeletal systems. It is associated with swelling, stiffness and pain and can lead to significant loss of performance and mobility in severe cases [2]**.** Although, RA defined as one of autoimmune diseases when the body's immune system attacks its own tissues, but the onset of RA is not clear. However, it can be attributed to genetic liability to the disorder, several viruses and bacteria such as Epstein- Barr-Virus and Mycobacterium tuberculosis, disruption of the immunological tolerance as well as weakening the immune system of people as a result of the psychological condition. [3] Moreover, because of unknown etiology, cures of RA have not been discovered yet as well. Treatments and therapies are applied largely to reduce symptoms and delay the progress of the disease [1]. RA affects 0.5% to 1% of the general population worldwide, and it is more common in women than men. Although the prevalence is surprisingly constant across the globe, regardless of geographic location and race, there are some exceptions. For instance, in China the occurrence of RA is somewhat lower (≈ 0.3%), whereas it is substantially higher in other groups such as the Pima Indians in North America (≈5%). In Iraqi populations was reported at around 1 %. [4]. Rheumatoid Arthritis is a disease that requires follow-up and long-term management. "The purpose of teaching a patient is to maintain or improve health, or, in some cases, to slow down the deterioration," said Loreg. [5]. Patient education programs have to be an integral part of treatment because of the pain and disability the people with arthritis face on a daily basis. Patient education is crucial as it allows better compliance and ability to cope with the psychological, physical and the social problems associated with the disease. Therefore, it has to be a complement to traditional medical treatment. [6.] Patient education is very important for the patient to comply

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with the treatment, to change behaviors and thus to prevent disability [7].

MATERIALS AND METHODS

Design of the Study: A descriptive study design was conducted in the Outpatient Clinics for Rheumatology at AL- Yarmouk Teaching Hospital, from April to May 2018, A non-probability (purposive) sample of (40) of rheumatoid arthritis adult patient (male & female), above 18 years. and those who were coming for follow-up for more than 1 months were included. The selection of clients was simply randomly clients who have RA, who ethical approval informed consent was obtained from each participant included in this study.

Instrument: For the purpose of data collection, a questionnaire was used, which consists of three parts, **first part** concerning the demographic data form that included the gender, age, level of education, marital status, occupational status and monthly income of the patient, **the second part** concerning clinical characteristics included, the duration of the disease the chronic disease, drugs regulation and the allergy drugs of RA, the **third part** concerning the measure of rheumatoid arthritis patients' knowledge and their its needs. The ACREU rheumatoid arthritis knowledge questionnaire [(1)], was used to collect data from RA patients, which was translated into local language "Arabic". The questionnaire consists of 31 items covering (8) domains included (prognosis/ outcome (8), joint protection (5), energy conservation (2), pain management (3), coping strategies/feelings (9), exercise (2) and medications (2). The validity of the checklist was determined through presenting it to (21) specialist experts and its reliability was determined through using Cronbach's alpha coefficient. Finally, the test–retest reliability of the ACREU rheumatoid arthritis knowledge questionnaire and 10 patients were assessed twice in four-week intervals.

Data collection: The study was implemented in the outpatient clinics for Rheumatology at AL- Yarmouk Teaching Hospital. The patient who met the study criteria, were approached in the study, the patients were invited to participate in the study and explain the study objectives.

Statistical Analysis: The data analysis through use a descriptive statistical analysis procedures and inferential analysis procedures (SPSS 21).

RESULTS AND DISCUSSION

Table (1) shows that the socioeconomic status of the 40 participants, 27 (67.5%) were females and 13 (32.5%) were males. The overall mean age was 41.30±9.9 years. Moreover, 14 (35.0%) of the participants were aged between 40-49 years. Based on their educational background, the most 18 (45%) of patients graduate from secondary school, 11(27.5%), with primary education and 4 (10%) with Higher education, and 6 (17.5%) had unknown educational backgrounds., (70.0%) of patients were married, 60.0% were Housewife. concerning monthly income. 10% of the patients had monthly income less than (300,000 ID.), (25%) of patients had a monthly income between (300,000 – 600,000 ID.). and majority (40%) of the patients had monthly income between (600,000 – 900,000 ID). whereas the remaining (25%) had a monthly income of more than (900.000 ID.). The results of table (2) show medical history for patients with RA, the table revealed that the most (75.0%) of the patients had chronic disease, (67.5%) of the patients taken drugs regularly. Base on drug allergy only (10.0%) of the patients had drug allergy. Concerning duration of the disease, high percentage (52.5%) of patients the duration range was (4-6) years, and (17.5%) of patients the duration was more than 7 years. Related ESR, the majority of patients were above the normal range. Table (3) presented the RA patient knowledge related the Prognosis, Outcome, Information about disease, joint Protection, energy conservation, and pain management, the table revealed that the mean score of knowledge of patients in all domains was very, except pain management domain was rated low. Table (4) The table revealed that the mean score of knowledge related the coping strategies, exercise, and medications was very, except pain management domain was rated low. The Results of table (5) presented that their No were significant relationship between Patients' knowledge domains and social-demographic characteristics at $p \geq 0.01$ value. The Results of table (6) presented that their No were significant relationship between Patients' knowledge domains and Clinical Characteristics at $p \geq 0.01$ value. About the age group (35%) of RA patients were in the age group 40–49 years with mean age (41.30±9.9) years, this results comes along with a study [13] that found that the sample age was (41–60) years old and is coming inconsistent with the findings of the study [10] mentioned that the majority of study sample ages were between [12, 13] years. A High percentage (45%) of the present study the

patient graduate from secondary school, this result agrees with in his study [13] who mentioned that the most (60%) of the sample in his study are graduating from secondary school. In additional other study[12] found that the (62.7%), of the sample were graduate from the Secondary School.

Table 1. Distribution of RA patients, according to demographic characteristics (n=40)

Variable		Frequency (F)	Percent (%)
Gender	Male	13	32.5
	Female	27	67.5
Age by years	20-29	6	15.0
	30-39	13	32.5
	40-49	14	35.0
	50-59	6	15.0
	Over 60	1	2.5
	Minimum	22	
	Maximum	61	
	Mean and Std. Deviation of patients' age	41.30	9.900
Marital Status	Single	6	15.0
	Married	28	70.0
	Widow	4	10.0
	Divorced	2	5.0
Level of education	Reads and Writes	6	17.5
	Primary School	11	27.5
	Secondary school	18	45.0
	Higher Education	4	10.0
Occupational status	Government Employee	3	7.5
	Un employee	2	5.0
	Privet Work	5	12.5
	Retired	2	5.0
	Housewife	24	60.0
	student	4	10.0
Monthly income (Iraqi Dinar) (ID)	less than 300	4	10.0
	300 - 600	10	25.0
	600 -900	16	40.0
	900 - More	10	25.0

Table 2. Distribution of RA patients, according to clinical characteristics (n=40)

Variable		Frequency (F)	Percent (%)
Chronic Disease	Yes	30	75.0
	No	10	25.0
Drugs Regulation	Regular	27	67.5
	Irregular	13	32.5
Drugs Allergy	Penicillin	4	10.0
	Sulfa drugs and another	3	7.5
	No allergy	33	82.5
Duration of Disease	1 - 3 Years	12	30.0
	4 - 6 Years	21	52.5
	7 - More	7	17.5
ESR	less than 20 mm/hr.	2	5.0
	20- 29 mm/hr.	8	20.0
	30 -39 mm/hr.	14	35.0
	40- 49 mm/hr.	13	32.5
	50-59 mm/hr.	3	7.5
	Minimum (16), Maximum (56), Mean and Std. Deviation 37.48±10.028		

Table 3. Mean, stander deviation and relative sufficiency of patients' knowledge related Prognosis, Outcome, Information about disease, Joint Protection, Energy Conservation, and Pain Management. n= 40

Domains	NO	Question	Mean	S.D	Grad
Prognosis, Outcome, Information about disease	1	For some people, rheumatoid arthritis causes very few problems	2.93	0.944	Low
	2	Meeting other people with rheumatoid arthritis in a group can teach you many things.	3.00	1.038	Low
	3	Rheumatoid arthritis is different in everyone.	3.00	0,906	Low
	4	Rheumatoid arthritis affects only the joints.	2.98	0.920	Very low
	5	Your doctor will tell you everything you need to know about your rheumatoid arthritis.	3.10	0.928	Low
	6	Most people with rheumatoid arthritis end up in a wheelchair.	2.70	1.018	Very Low
	7	The cause of rheumatoid arthritis is not known.	3.00	0.906	Low
	8	Rheumatoid arthritis sometimes goes away.	3.03	0.862	Low
	Total	Mean of means	2.96		

Joint Protection	1	Splints should be worn if you have pain in your wrists when you work with your hands	3.08	1.071	Low
	2	Ice treatments often make the joints swell.	3.20	0.823	Low
	3	If you have rheumatoid arthritis, the arches in your feet may need extra support.	2.83	0.874	Very Low
	4	You can protect the joints in your hands by using the palms of your hands instead of your fingers to do chores.	2.88	0.883	Very Low
	5	It's good for your feet to wear supportive shoes in the house instead of slippers.	3.00	0.906	Low
	Total	Mean of means	2.99		
Energy Conservation	1	To save energy, people with rheumatoid arthritis should sit when working instead of standing.	3.13	0.883	Low
	2	Most people with rheumatoid arthritis have to quit their jobs.	2.80	0.883	Very Low
	Total	Mean of means	2.96		
Pain Management	1	A damaged joint hurts more when you rest it.	2.93	0.917	Very Low
	2	It is easy for your family/friends to tell when you are in pain.	2.98	1.000	Very Low
	3	Neck pain can be caused by a poor sleep position.	3.13	0.822	Low
	Total	Mean of means	3.01		

Table 4. Mean, stander deviation and relative sufficiency of patients' knowledge related Coping strategies, Exercise, and Medications. n= 40.

Domains	NO	Question	Mean	S.D	Grad
Coping strategies /feelings	1	The presence of rheumatoid arthritis often results in family stress.	2.95	1.011	Very Low
	2	Many people with rheumatoid arthritis are scared about the future.	3.05	0.932	Low
	3	Anger is a common reaction when someone is first told they have rheumatoid arthritis.	2.89	0.832	Very Low
	4	It is common to feel depressed when you have rheumatoid arthritis.	2.93	0.888	Very Low
	5	People with rheumatoid arthritis often lose confidence in themselves.	3.00	0.784	Low
	6	There is no relationship between stress and rheumatoid arthritis.	2.88	1.017	Very Low
	7	All people with rheumatoid arthritis get "crooked joints"	2.90	0.841	Very Low
	8	Talking about your rheumatoid arthritis with someone you trust can make you feel better.	2.88	1.090	Very Low
	9	When you are having a good day, you should get all your chores done.	3.03	0.800	Low
	Total	Mean of means	2.94		
Exercise	1	When you are in a flare, you should stop all exercise.	3.13	0.723	Low
	2	If you have rheumatoid arthritis, the ability to fully straighten and bend your joints can be lost quickly.	3.05	0.932	Low
	Total	Mean of means	3.09		
Medications	1	When you are feeling well, you should reduce your arthritis medications.	3.00	1.013	Low
	2	The pharmacist is a good source of information about your arthritis medications.	3.03	0.800	Low
	Total	Mean of means	3.01		

Table 5. Association between social-demographic characteristics and patients' knowledge related

Variable		Mean	Std. D	Test	Sig.
Gender	Male	94.0	5.99	t= 1.339	.246 (NS)
	Female	91.6	5.12		
Age	20-29	91.6	5.39	F=.318	.864 (NS)
	30-39	91.8	6.02		
	40-49	93.7	5.25		
	50-59	91.5	6.09		
	60-More	91.0	6.03		
Level of education	Illiterate	99.0	5.35	F= .600	.619 (NS)
	Reads and Writes	92.8	4.44		
	Primary School	90.1	4.81		
	Secondary school	93.1	6.36		
	Higher Education	93.2	3.40		
Marital Status	Single	93.1	7.19	F= .919	.464 (NS)
	Married	92.8	5.01		
	Widowed	90.0	7.16		
	Divorced	89.0	4.24		
Occupation	Government Employee	96.0	8.88	F= .919	.464 (NS)
	Un employee	91.5	0.70		
	Privet Work	96.6	3.78		
	Retired	93.5	9.19		
	Housewife	90.8	4.76		
	student	93.7	7.04		

Table 6. Association between Clinical Characteristics and RA patients' knowledge related.

variable		Mean	Std. D	Test	Sig.
Chronic Disease	Yes	93.0	5.66	t= 1.339	.254 (NS)
	No	90.7	4.64		
Drugs Regulation	Regular	93.0	5.74	t= .917	.344 (NS)
	Irregular	91.2	4.83		
Drugs Allergy	Penicillin	88.50	4.12	F= 2.874	.069 (NS)
	Sulfa drugs and another	87.6	6.65		
	No allergy	93.3	5.21		
Duration of Disease	1 - 3 Years	92.8	5.13	F= .061	.941 (NS)
	4 - 6 Years	92.1	5.67		
	7 - More	92.5	6.16		
ESR	less than 20	97.0	8.48	F= 1.255	.306 (NS)
	20 -29	91.2	5.11		
	30 -39	90.7	5.63		
	40 -49	93.4	4.61		
	50 - more	96.0	6.92		
Previous of Surgery	Yes	92.5	6.89	t=.007	.933 (NS)
	No	92.3	4.96		

***Cont...*Table 6. Association between Clinical Characteristics and RA patients' knowledge related.**

If has any Type Of Operation	Surgery for eye	94.4	7.16	F=.410	.747 (NS)
	Hernia	91.7	8.53		
	another surgery	89.5	3.53		
	Doesn't has Surgery	92.3	4.96		

CONCLUSION

Rheumatoid arthritis is a chronic inflammatory disease requiring long-term management and counselling, so focus to given to the counselling and education of the patients. On the other hand, patient education in rheumatoid arthritis (RA) is strongly recommended to support patient management.

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Immunohistochemical Expression of CDX2 Protein in Iraqi Patients with Human Gastric Cancer (HGC)

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ABSTRACT

This study aimed to evaluate the IHC expression of CDX2 protein in HGC patients and control groups and also to study the correlation between IHC expression of the CDX2 and different clinicopathological variables such as: age, gender, histopathological subtype, grade, and stage of the tumor in HGC cases. the retrospectively sectional study for the period from 2014 to 2018 included a total of 60 formalin fixed paraffin embedded blocks of the HGC tissue (partial or total gastrectomy specimens) that collected from the archived materials of the Department of Pathology of Baghdad Teaching Hospital and the Center of Gastrointestinal and Hepatic Diseases, and also some samples were collected from other private laboratories. The IHC expression of the CDX2 was significantly increased in HGC group compared with control groups ($p<0.0001$). A clinic-pathological assessment revealed that patient's samples involved 20 males and 10 females; Male to female ratio was 2:1. The age of patients was ranged between 18-76 years with a mean ± standard error of (48.39±12.39) year. The majority of the HGC cases, in this study (53.3%) were above 48 years of age. the commonest histopathological subtype was the diffuse subtype (46.6%).

***Keywords**: CDX2, HGC, IHC expression*

INTRODUCTION

Human Gastric Cancer (HGC) is fifth most common malignancy diseases in the world with nearly one million new cases of HGC are reported in 2012 preceded by lung, breast, colorectum and prostate cancers respectively. It is the third leading causes of cancer related death throughout the world in both sexes [1, 2, 3]. Almost two thirds of them occur in developing countries with peak incidence in the Far East regions including China, Korea and Japan. In Iraq, HGCs have come at the 7th rank among the other body cancers in 2013 and it is the 7th commonest cancer at in men and women [(4)]. The male: female ratio equals to 1.6:1[5]. The large majority approximately 95% of HGC are adenocarcinoma [6]. Several abnormalities in oncogenes and tumor suppressor genes have been identified in HGC. This study focused in this study on CDX2 protein, which is a good-established gastric marker protein and is usually used for the clinical evaluation of HGC There have been many previous articles demonstration the IHC expression of CDX2 protein and prognosis of HGC, but the correlation between the IHC expression of CDX2 protein and HGC is still controversial CDX2 protein, an intestine-specific home box gene product, plays fundamental role in intestinal development; CDX2 & CDX1 is expressed in the in hindgut related organ such as intestine that assume the responsibility of cell differentiation [7]. Several studies have been indicated that ectopic IHC expression of CDX1 or CDX2 is detected in intestinal metaplasia of the stomach. The aim this study is to assess whether the CDX2 protein could be used as a predictor in patient with HGC and also examine the relationship between the IHC expression of CDX2 protein in normal stomach and in HGC cases and its correlation with different clinicpathological risk categories such as: age, gender, histpathological type, grade, and stage of the tumor in HGC.

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MATERIALS AND METHOD

A retrospective audit study on 60 cases for the period from 2014 to 2018, the samples were divided into two groups 30 patients with HGC and 30 healthy samples with Normal stomach (as control group). 60 formalin fixed paraffin embedded blocks of the HGC tissue (partial or total gastrectomy specimens) are selected randomly from archived materials of Pathology laboratory of Baghdad Teaching Hospital and the Center of Gastrointestinal and Hepatic Diseases, and some samples were collected from private laboratories in Baghdad in this study. All clinicpathological information including age, gender, histopathological type, grade and stage of tumor were taken from the patients reports. One section of the paraffin embedded of HGC tissue blocks was stained with H&E and reviewed the histopathological diagnosis, while another one section were stained with IHC was carried out with the CDX2 monoclonal antibody (abcam, UK; optimal dilution, 1:250). Immunohistochemistry Deparaffinization and endogenous peroxidase inactivation of clinical tissues were performed For CDX2 and the samples were hydrated heating in 50 mm EDTA buffer solution (pH 7.0) at 95c was then placed in the water bath (Gallen kump, England) for 30 min for antigen retrieval. The primary anti-CDX2 antibody was applied for one hour at room temperature. After washing in PBS two times, the secondary antibody (Dako, Denmark) was applied for 30 min at room temperature, and incubation with antibody conjugated to HRP (Dako, Denmark) for 10 min at room temperature. After that, the slides were counterstained with Mayer's hematoxylin for 5min and dehydrated in alcohol prior to mounting. IHC reaction is considered positive when brown staining is nuclear for CDX2, the positive control for CDX2 IHC reaction was taken from the Colon carcinoma. Technical negative control for CDX2 was obtained by omission of the primary antibody. The results of IHC expressions of the CDX2 were analyzed in a semiquantitative fashion abased to Halder and his coworker [8] Score 0: 0-5%, Score 1: 6-35%, Score 2: 36- 65%, Score 3: ≥ 66% of tumor cells were positive. The IHC expression of the CDX2 was analyzed statistically in relationship to Clinicpathological parameters of HGC using Fisher's exact probability test, Student t-test. Values were considered statistically significant when $P<0.05$.

RESULTS AND DISCUSSION

30 cases of control group included 17(56.6%) female and 13(43.3%) male with a mean of age 39.27±4.266 and rang between 33-48 years. 30 of HGC tissue blocks were studied and the results revealed that the samples included 20 (66.6%) males & 10 (33.3%) females and male to female ratio was 2:1. The age of patients was ranged between 18-76 years with a mean±SD 48.39±12.39 years. For age distribution of HGC cases, the samples observed that 16(53.3%) of HGC cases were above ≥48 years, while 14 (46.6%) were <48 years. Large proportion of the histopathological subtype showed the predominance of diffuse subtype 14 (46.6%) compared to intestinal subtype 12(40%). This study revealed that the majority of cases were moderately differentiated 19 (63.3%) followed by poorly differentiated 10 (33.3%) of the cases and 1(3.3%) case of well differentiated. The majority of deeding invasion of HGC cases 23 (76.6%) falls in stage pT3 subserosa. According to TNM staging system, the majority of IHC expression of the CDX2 in HGC cases 16(53.3 %) fall in stage advanced disease (III&IV), while 10(33.3%) was in stage early disease (I&II).

CDX2 immunohistochemical expression

The IHC expression of the CDX2 in HGC cases and control groups were measured by IHC. The mean percentage of CDX2 protein was significantly increased ($p<0.0001$) in HGC cases than in control group, the differences in frequency of distribution of cases with positive and negative expression of CDX2 of the studied cases are summarized as shown in table (1), fig. (1). CDX2 was not expressed immunohistochemically in all studied normal stomach cases (0%) and expressed in 21 (70%) cases of HGC, with significant increase in its expression with increasing of the lesions severity ($p < 0.001$). Regarding CDX2 staining scoring, the majority of cases of carcinoma 30 out of 10(33.3%) showed in score +3, while only 7 out of 30 cases of HGC (23.3%) were in score +2 and the rest of the cases showed 4(13.3%) in score +1. 9 out of 30 (30%) were negative for CDX2. The age of the patients which included 12 (40%) of HGC cases were ≥ 48 years and these showed positive CDX2 expression, and 9(30%) of HGC cases were positive CDX2 expression in the age <48. Out of 20 male cases of HGC, only 12(40%) cases showed positive CDX2 expression, while out of 10 female cases of HGC, only 9(30%) cases showed positive CDX2 expression;

statistically there was no significant relation between CDX2 expression with age and gender as shown in Table (2). In consideration to the histopathological subtype, out of 14 cases of diffuse subtype HGC, 9 (30%) cases of them showed positive CDX2 expression, while out of 30 cases of intestinal subtype of HGC, only 10(33.3%) cases showed positive CDX2 expression; although these results were statistically not significant As shown in table (2). Out of 19 cases of moderately differentiated type of HGC, 16(53.3%) cases of them showed positive CDX2 expression, while out of 10 cases of poorly differentiated type of HGC, 4(13.3%) cases of them showed positive CDX2 expression. Regarding the relationship between HGC cases and stage of tumor, out of 30 cases of HGC falling in stage pT3 (subserosa), 19(63.3%) cases of them showed positive CDX2 expression, while one case falling in stage pT2 (muscularis propria) & pT4 (serosa) showed positive CDX2 expression. these results significantly detected a correlation with tumor invasion and grade tumor p value = 0.014 and 0.03 respectively. As shown in table (2). Worldwide, HGC is one of the commonest cancers after lung cancer and a major cause of mortality and morbidity, especially in developing countries [9]. The etiology of HGC includes both genetic and environmental factors such as *H .pylori* [10]. Multiple genetic alterations are detected not only in gastric carcinoma, but also in tumors at other sites. In HGC, CDX2 is present solely in tumor cells while it is not so in adjacent normal stomach mucosa. It is also present in nucleus of pre lesion epithelium surrounding tumor in varying degrees specially, intestinal metaplasia [11]. In the present study has shown that CDX2 expression was significantly higher in carcinomas than normal stomach cases (70%versus 0%, p<0.0001). All control cases were negative for CDX2 expression. This observations of this study are comparable to the literatures which stated that the CDX2 was not expressed in normal stomach mucosa with increase in its expression with increasing severity of the lesion from normal to invasive HGC [12, 13, 14]. Taking the age in consideration, this study revealed non-significant association between patient's age and IHC expression of CDX2. This result nearly compatible with that obtained by other study done by Abdul-Azeem & Radi [15], and also with a study of Zhang *et al*. [16]. Also non-significant correlation was found between IHC expression of CDX2 and patient's sex. The slightly increase in the expression rate in males than females could be attributed to the higher incidence rate of HGC in males compared to females, and similar results were seen in different studies [17, 18].Concerning the histopathological subtypes of HGC, this study shows non-statistically significant difference in IHC expression of the CDX2 in histopathological subtype of HGC, This result is consistent with done by other studies. On the contrary to the above results, some studies found different observations. Some of these studies had found a significant relationship between IHC expression of the CDX2 and histopathological subtype of HGC, the positivity rates were higher in intestinal subtype of HGC than diffuse subtype. Actually it was difficult to interpret the causes behind such conflicting data, it could be attributed to different factors such as geographical, racial, technical, analytical as well as the results have been interpreted using a wide variety of protocol variables and scores, which makes the comparison between studies rather difficult. Regarding the tumor grade of HGC, in the current study was found statistically a significant difference in IHC expression of the CDX2 among different grades of studied HGC cases. The current work showed a significant lower CDX2 in poorly differentiated and higher value was detected in moderately differentiated. This result agrees with results similar other studies. Some studies are in discordance to the present one.

Table 1. IHC expression of CDX2 among studied groups

Studied group	CDX2 expression score				expression
	0	+1	+2	+3	
Control cases	30(100%)	0(0%)	0(0%)	0(0%)	(%0)0
HGC cases	9(30%)	4(13.3%)	7(23.3%)	10(33.3%)	21(70%)
Total	39(65%)	4(16.6%)	7(11.6%)	10(16.6%)	(34%)21
p-value	P= 0.0001				

Table 2. Distribution of CDX2 expression in HGC cases in relation to different studied Clinic pathological characteristic

Clinic pathological characteristic		**CDX2 expression**		**p-value**
Age	>48	positive	9(30%)	P= 0.53[N.S]
		negative	5(16.6%)	
	≥48	positive	12(40%)	
		negative	4(13.3%)	
Gander	Male	positive	12 (40%)	P=0.29[N.S]
		negative	8 (26.6%)	
	female	positive	9 (30%)	
		negative	1 (3.3%)	
Subtype of tumor	intestinal	positive	10(33.3%)	P=0.24[N.S]
		negative	2(6.6%)	
	diffuse	positive	(30%)9	
		negative	5(16.6%)	
	mixed	positive	2(6.6%)	
		negative	2(6.6%)	
Tumor grade	Well differentiated	positive	(3.3%)1	**P= 0.03**
		negative	0(0%)	
	Moderate differentiated	positive	(53.3%)16	
		negative	3(10%)	
	poorly differentiated	positive	(13.3%)4	
		negative	6(20%)	
Tumor invasion	pT2	positive	(3.3%)1	**P= 0.014**
		negative	(3.3%)1	
	pT3	positive	19(63.3%)	
		negative	4(13.3%)	
	pT4	positive	1(3.3%)	
		negative	4(13.3%)	
TNM stage	I&II	positive	10(33.3%)	P=1.00
		negative	4(13.3%)	
	III&IV	positive	11(36.6%)	
		negative	5(16.6%)	

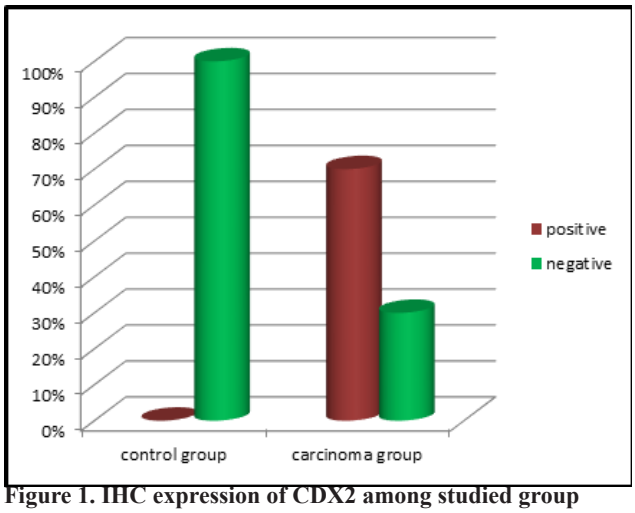

Figure 1. IHC expression of CDX2 among studied group

CONCLUSION

This study showed that the IHC expression of the CDX2 was increased in carcinoma tissue, the overall expression of CDX2 in HGC cases in the present study was 70% and there was no significant correlation between IHC expression of the CDX2 and different clinicopathological variables such as: age, sex of patients, histopathological subtype and TNM stage. While there was significant correlation between IHC expression of the CDX2 and tumor grade in which CDX2 expression was more common in moderately differentiated type HGC cases than in poorly differentiated type. From the above results it is obvious that CDX2 plays an important role in the progression of the gastric neoplastic transformation and has utility to differentiate premalignant from malignant lesions of the HGC, and this might improve the accuracy, precision and sensitivity of gastric lesions diagnosis. The relationship between the IHC expression of the CDX2 and the tumor grade may be a useful additional prognostic factor.

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Association between Transcription Factors 7-like 2 (rs7903146) Polymorphism and Some Renal Biomarkers with Type 2 Diabetic Nephropathy Complications

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ABSTRACT

Diabetes mellitus as the most prevalent metabolic disease is a multifactorial disease which is influenced by environmental and genetic factors. In this systematic review, we assessed the association between genetic variants and diabetes/its complications in studies with Iraqi populations Conducted in this study was to investigate the possible role TCF7L2 rs7903146 (C/G) variant on susceptibility of T2DM among Iraqi type 2 diabetic patients with nephropathy complications and its relations with some type of kidney biomarkers .this case –control study included 100 T2DM patients and 100 patient with kidney failure 100 healthy person (control group). The results confirm the association between the TCF7L2 rs7903146 polymorphism and increase risk for type 2 diabetes in Iraqi an populations.

Keywords: *Single nucleotide polymorphism; type 2 diabetes mellitus; transcription factor 7-like 2 (TCF7L2).*

INTRODUCTION

Type 2 diabetes is associated with impaired insulin secretion .boty 1 st and 2 nd phase insulin secretion are reduced, but the effect is particularly pronounced for the 1 st phase. Although both genetic and environmental factors are thought to play a role , the processes culmination in impaired insulin secretion are not completely understood , but both genetic and environmental factors are thought to play a role . Over the past 2 years, genome-wide association scans have transformed the genetic landscape of type 2 diabetes susceptibility TCF7L2, the susceptibility gene with the strongest effect on disease susceptibility discovered to date, was conferred pre genome- wide association[1]. In 2006, with rapid replication TCF7L2 of its consequence on diabetes susceptibility in multiple population was positional candidate gene that mapped to region spanning 215.9kb on human chromosome 10q25 with replicated linkage to T2DM [11]. The incidence and prevalence of diabetes mellitus (DM) have increased sharply throughout the world .According to the latest report, the prevalence of DM has increased to 11.7% in China [2] and 9.1% in the world [3]. The total number of adult diabetes is expected to rise to 642 million by 2040 [3]. Diabetic nephropathy (DN), 1 of the most serious complications of DM, is a progressive kidney disease caused by damage to the capillaries in the kidneys' glomerular. End-stage renal disease (ESRD) is the most severe form of chronic kidney disease. Also known as Stage 5 chronic kidney disease or kidney failure. DN is the leading cause of ESRD in the Europe, Japan, and the United States [4]. DN was also the major cause for 40.4% of newly developed ESRD in the United States [5,6]. In the UK, it was estimated that around one third of patients with ESRD were due to diabetes [7]. In Korea, according to the Fifth Korea National Health and Nutrition Examination Survey in 2011, the prevalence of DN was 26.7% [8]. In China, the Shanghai Diabetic Complications Study reported that the prevalence of DN was 26.2% [9]. The expenditure for people with DN are extraordinarily high. In the Medicare population alone, DN-related expenditures among this mostly older group were nearly $25 billion in 2011 [10]. Therefore, earlier diagnosis and prevention of DN become imminent. However, the mechanism of DN is complicated, in addition to the risk of poor glycemic control and hypertension, inherited factors are considered to play an important role in its progression.

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A systematic review showed that the prevalence rate of type 2 diabetes in iraq was 10.2% of the population, ranking ninth in the Arab world, the world's thirty most in terms of injuries. Transcription factor 7-like 2 (TCF7L2) gene is located on chromosome 10q25.3 [11], which encodes a transcription factor with a high-mobility box and functions in gene activations related to downstream events of the when signaling pathway. TCF7L2 has been revealed as an susceptibility gene for type 2 diabetes [12]. There are at least four well- studied single nucleotide polymorphism (SNP) markers in the human TCF7L2 gene, which are associated with T2DM. viz,rs 7903146, rs7901695, rs12255372 and rs11196205. Previous studied have shown an association between T2DM and rs7903146 polymorphism of (TCF7L2) gene. There is no inclusive information for genetic association studies of diabetes in Middle Eastern population including Iraqi an population. The aim of this study was to investigate the possible role TCF7L2 rs7903146 (C/G) variant on susceptibility of T2DM among Iraqi type 2 diabetic patients with nephropathy complications and its relations with some type of kidney biomarkers.

MATERIALS AND METHOD

Study design

A case – control study.

Patient's classes

One hundred (100) patients with type 2 diabetes mellitus and one hundred (100) patients with type type 2 diabetes mellitus with Kidney failure who admitted to some of Iraqi teaching hospital as well as one hundred (100) healthy person (control group).

Sample collection and processing

Blood samples were collected in the morning by venipuncture using (10 mL) disposable syringes. Blood was divided into two parts :

The first will be used for (biochemical analysis) 8ml was put in the gel tube and left to clot for 30 minutes in room temperature and then separated by centrifugation at 4000rpm for 5 minutes .

The second will be used for (molecular analysis) 2 ml blood was put into EDTA tube , mixed gently and put on shaker for DNA extraction .

Parameters to be measured:

Glycated hemoglobin (HBA1c)

serum Urea and creatinine levels

serum lipid profile (total cholesterol, HDL,LDL,VLDL,TG)

serum glucose level.

Genotype analysis

Genomic DNA was be extraction from both healthy and patient groups.

The purity and concentration of extraction DNA was be assessed by specific prime.

AGAGAGCTAAGCACTTTTTAGACAC C allele

AGAGAGCTAAGCACTTTTTAGACAG G allele

AGATGAAATGTAGCAGTGAAGTG Generic primer

Selected PCR protocol to verify the SNP at the axon of intended gene, in addition to another one at intone.

Amplifying the segment of gen contain SNP by PCR and electrophoresis techniques.

correlation studies between the different phenotyping and genotyping data obtained.

The preferred condition which provided the best result was addition of:

12.5 µL mater mix

1.5 µL C allele

1.5 µL G allele

1.5 µL Generic primer

5 µL DNA sample

4.5 µL nuclease free water. A total reaction volume is a 26.5 µL that added to the 500µl PCR tube at 25^{o} C then, centrifuged for 30 seconds at 2000 xg in a micro centrifuge for mixing the sample tubes and then placed in thermocycler.

Statistics

Genotype and allele frequencies were calculated

for the described SNPs. The groups were compared using the $\chi 2$ test to analyze the statistical significance of the difference in allelic distribution of various polymorphisms in patients and controls. Values of $p<0.001$ were considered statistically significant. Odds ratio was performed using MedCalc for Windows, version 7.4.1.0 (MedCalc Software, Mariakerke, Belgium)

RESULTS AND DISCUSSION

Clinical and biochemical characteristics of study subjects. The current study included 300 subjects (100 DM,100DN and 100 healthy individuals). The clinical and biochemical characteristics of the recuritued individuals were presented in Table (1). It shows significant differences in (Glucose, Urea, Creatinine, Triglyceride, Cholesterol, LDL,HDL,VLDL, HBA1C) in the group of DM/DN patients when compared with those of the health group. However, no significant difference was seen in Age.

Genotype SNP rs7903146 for DN

Allele-Specific PCR Assay to Genotype SNP rs7903146 in TCF7L2 Gene for Rapid Screening the patient with DN The amplification product of TCF7L2 Gene polymorphism was obtained to have a size of 197 bp. The PCR product was electrophoresed on 1.5% agarose and directly visualized with ethidium bromid under UV light. The amplification and the size of the resulted ammplicons were confirmed by agarose gel electrophoresis analysis Figure (1).

Genotype SNP rs7903146 for DM

Allele-Specific PCR Assay to Genotype SNP rs7903146 in TCF7L2 Gene for Rapid Screening the patient with DM The amplification product of TCF7L2 Gene polymorphism was obtained to have a size of 197bp. The PCR product was electrophoresed on 1.5% agarose and directly visualized with ethidium bromid under UV light. The amplification and the size of the resulted ammplicons were confirmed by agarose gel electrophoresis analysis Figure (2). Through the results described in the research we can conclude the following: High concentration of glucose, lipids (TG, TC) and lipid proteins (LDL, VLDL) with low concentration of(HDL) in blood type 2 diabetic patients and also in kidney patients compared to control group. This is consistent with many previous studies[13,14]. Which indicate a higher glucose concentration in patients with type 2 diabetes than in control group. The reason for the high level of glucose in people with type 2 diabetes is due to lack of insulin secretion or a defect in the resistance of insulin receptors in the body or in the pancreas and dysfunction of the pancreas and metabolism. There was no apparent significant relationship between the age of type 2 diabetic patients and renal failure patients. It was found that the relationship between the level of lipids (TG, TC) and glucose is significant in the blood type 2 diabetics and control group and also this relationship is significant morbidity between these lipid and kidney patients with diabetes. The relationship between lipid protein analysis (LDLc, VLDL) was significantly higher in the blood of type 2 diabetic patients and diabetic kidney patients than in control group. It was also found that the proportion of these lipid proteins higher in patients with diabetes kidneys than in patients with type II diabetes. The relationship between high density lipoprotein (HDLc) and glucose is significantly reversed in the blood of type 2 diabetics, as well as in the blood of kidney patients compared to control group, where they are inversely insignificant. (HDLc) was found to be lower in patients with diabetes than in patients with type 2 diabetes who did not have kidney disease. The relationship between the level of sugar cumulative(HbA1C) positive morbidity in the blood of patients with diabetes type II compared to the level in the control group. The relationship between blood glucose of type 2 and kidney and ages patients is not significant with control group. As for urea, it was found that there was a significant relationship between the proportion of urea in patients with type 2 diabetes and control in the control group. While the relation was significant between the proportion of urea in people with kidney disease and control group. The ratio of creatinine in the serum of people with diabetes is significantly lower with its level in the control group, while this relationship is significantly stronger among kidney patients and its level in control group. In the genetic analyzes (CC, CG, GG), the statistical results showed that there is significant difference between the disease and control group and this is evident in the values of (P-Value) in addition to the value of OR(Odds ratio)

Table 1. The standard deviation, rate and probabilistic level of some clinical and biochemical characteristics is in serum of patients' and control group

Parameter	Control subjects Mean ±SD	DM Mean ±SD	DN Mean ±SD	P value
No (M/F)	100(59/41)	100(42/58)	100(49/51)	-
Age (y)	50.456.2	53.588.6	49.59 8.21	No significant
Glucose (mg /dl)	101.4 7.53 A	26294.4 b	136.783.9 c	<0.001
Urea (mg /dl)	30.64 8.59 B	31.7 15.4 b	177.7 62.4 a	<0.001
Creatinine (mg /dl)	0.8410.171 B	0.9850.302 b	10.2 4.7 a	<0.001
Triglyceride(mg /dl	108.6 35.6 B	195.7 124 a	126 86.3 b	<0.001
TC (mg/dl)	147 29 B	206 54.3 a	153.2 50.8 b	<0.001
HDL (mg/dl)	41.8 11.7 A	39 10 a	29.4 10 b	<0.001
LDL (mg/dl)	84 30.5 C	127.9 48.4 a	98.4 39.2 b	<0.001
VLDL (mg/dl)	21.7 7.11 B	39.1 24.8 a	25.317.26 b	<0.001
HbA1C(%)	5.06 0.36 C	10.214 2.24 a	6.03 1.6 b	<0.001

Table 2. Results of the assessment of genotype and allele frequencies DN

TCF7L2		Control n=100	DN n=100	Unadjusted OR (95% CI)	P value
Co dominant					
CC(Reference)	89	10			
CG		6	85	126.08 (43.91-326.1)	<0.01
GG		5	5	8.9 (2.19-36.14)	<0.01
Dominant					
GG+CG		11	90	72.8 (29.45-180)	<0.01

Cont... **Table 2. Results of the assessment of genotype and allele frequencies DN**

Recessive					
CC+CG(Reference)	95	95			
GG	5	5	1 (0.28-3.56)	1	
Additive					
2(GG)+CG	16	95	5.93 (3.25-10.83)	<0.01	
MAF%	16%	95%			

Table 3. Results of the assessment of genotype and allele frequencies DM

TCF7L2	**Control n=100**	**DM n=100**	**Unadjusted OR (95% CI)**	**P value**
Codominant				
CC(Reference)	89	15		
CG	6	78	77.13 (28.54-208.5)	
GG	5	7	8.306 (2.33-29.62)	<0.01
Dominant				
GG+CG	11	85	45.84 (19.93-105.4)	<0.01
Recessive				
CC+CG(Reference)	95	93		
GG	5	7	1.43 (0.43-4.66)	0.55
Additive				
2(GG)+CG	16%	92	5.87 (3.21-10.72)	<0.01
MAF%	16%	92%		

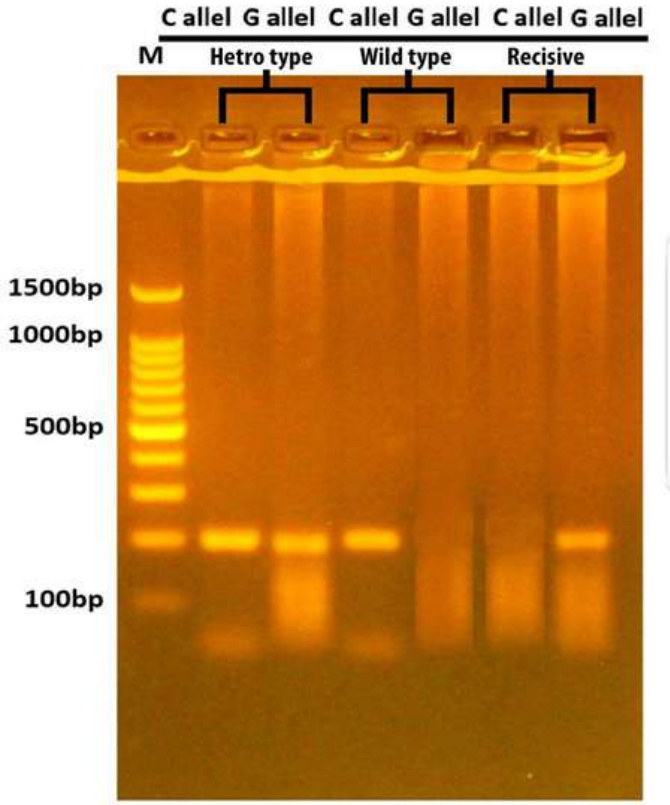

Figure 1. Product of TCF7L2 gene polymorphism analyzed by agarose gel electrophoresis. Line 1: DNA marker , line 2-3 hetrozygous , line4-5 wild type, line 6-7 homozygous.

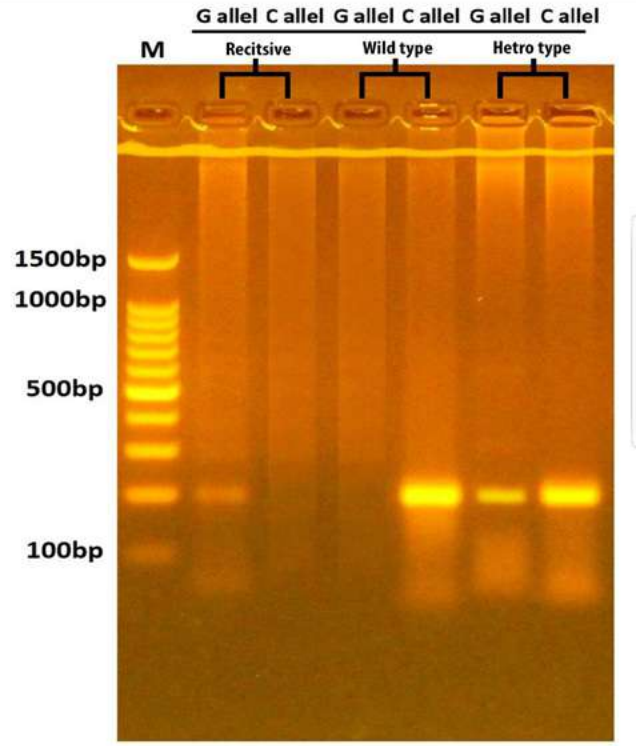

Figure 2. Product of resisten gene polymorphism analyzed by agarose gelelectrophoresis. Line 1: DNA marker 2, line 2-3 homozygous, line4-5 wild type, line 6-7 hetrozygous.

CONCLUSION

Conducted in this study was to investigate the possible role TCF7L2 rs7903146 (C/G) variant on susceptibility of T2DM among Iraqi type 2 diabetic patients with nephropathy complications and its relations with some type of kidney biomarkers .this case –control study included 100 T2DM patients and 100 patient with kidney failure 100 healthy person (control group). The results confirm the association between the TCF7L2 rs7903146 polymorphism and increase risk for type 2 diabetes in Iraqi an populations.

Financial disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Al-Furat Al-Awsat Techniques, Kufa, Iraq and all experiments were carried out in accordance with approved guidelines.

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Effect of Vitamin D Deficiency in Pregnant Woman

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ABSTRACT

Vitamin D deficiency (VDD) is a serious health problem for pregnant woman and their children. Because of the poor cultural and economic situation suffered by society and the adoption of the wrong system of nutrition and insufficient exposure to the sun and incorrectly. Vitamin D deficiency results in complications for newborns, which include low birth weight, low growth and respiratory infection. The ratio of the mother also causes vitamin D deficiency to several complications, including pregnancy diabetes due to a change in the proportion of glucose in pregnancy, septicemia and bacterial vaginosis. This complication may be due to lack of vitamin D supplementation by pregnant women. The association of vitamin deficiency during pregnancy with biochemical reactions affects the fetus in the formation of the skeleton, resulting in children with congenital rickets and fractures. Objectives: To assess the vitamin D deficiency in pregnant woman and her fetus health state, to identify the effect of vitamin D deficiency in pregnant woman and her fetus.

Keywords: *Effect, Vitamin D deficiency, pregnant woman*

INTRODUCTION

The world community today is suffering from some unhealthy behavioral changes towards the lack of exposure to the sun and incorrectly, in addition to the lack of intake of cod liver oil or so-called omega-3, which leads to risk of skin cancers and the exposure of children to rickets [1]. Vitamin D has fat solubility and also has the ability to form a steroid hormone inside the body, and plays an important role in the balance of calcium and phosphorus in the shortage causes rickets in children, and osteomalacia in adults [2]. Vitamin D deficiency lead to weak body immunity, the body's willingness to develop cancer, cardiovascular disease, diabetes, rheumatic diseases, weakness and chronic pain in the muscles, and neuropsychiatric weakness [3]. The aim of this study is to assess the status of vitamin D in this case of the mother and its effect in the newborn, in the case of failure program to introduce programmed support for pregnant women and inadequacy of giving pregnant women vitamin D supplements. Will lead to weak fetal growth and thus develop into the birth of disabled children and the most dangerous of them hit the rickets [4]. World ranging from 18-84% depending on the country and the habits worn by the country [5]. Therefore, mothers and their children should consult the health centers and hospitals for the necessary tests for vitamin D, and receive important instructions to prevent vitamin D deficiency during pregnancy and lactation its impact on the fetus and the newborn in childhood, in order to reduce the future development of chronic diseases in adulthood [6].

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METHODOLOGY

A descriptive study on non-probability sample (purposive sample) of one hundred Twenty (120) women to assess the effect of vitamin D deficiency in pregnant women who attending outpatient clinic for seeking treatment at Baghdad General Teaching Hospital , clinic of Mother and Child Center in Sheikh Omar, Advisory clinic at ALawiya Teaching Hospital. The questionnaire form was consisted of (4) main parts: Demographic characteristics, Reproductive Information Medical conditions, and Life Style Information. The data were collected by using interview method and self-report techniques with study participants. The data were collected by using interview method and self-report techniques with study participants after obtaining permission from each of them according to

the inclusion criteria.

Statistical analysis methods

Statistical data analysis approaches were used in order to analyze and assess results of this study which classified in two parts, descriptive statistics, such that tables observed frequencies, percentages, association tables, and inferential statistics, such that [Chi-Square test for testing the independency, Binomial test for testing two categories nominal scale, statistical hypothesis based on (C.C.) Contingency's Coefficient test.

RESULTS AND DISCUSSION

The study showed that the highest percentage (28%) of study sample at age group (22 – 34**)** years (table 1), (35.8%) of study sample years of marriage are ranging between (5-9) years (table 1), (87%) of study sample their socio-economic level were low (table 1). The highest percentage (38%) of study sample for the ratio of the number of pregnancies to the group (3-4) times (table 2), the highest percentage (30%) of study sample for the number of abortions (table 2), the highest percentage (50%) of study sample for number of living children (table 2), the highest percentage (14%) of study sample for the number of stillbirths (table 2), the highest percentage (43%) of study sample for delivery type of cesarean (table 2), the highest percentage (57.8%) of study sample for using breastfeeding reported feeding period less than or up to one year (table 2), the highest percentage (35%) of study sample for using artificial feeding (table 2). The highest percentage (79%) of study sample who suffer from hair loss (table 3), the highest percentage (67.5%) of study sample who suffer from difficulty boarding stairs (table 3), the highest percentage (65.8%) of study sample who suffer from difficulty to getting up after sitting position (table 3), the highest percentage (64%) of study sample who suffers from problems in the gums and teeth (table 3), the highest percentage (60%) of study sample who suffer from pain in the bones especially from the bones of the spine and thigh (table 3),the highest percentage (49%) of study sample who have difficulty washing the head (table 3).The highest percentage (90.8) of study sample who prefer light clothing (table 4), the highest percentage (83%) of study sample who eat eggs twice a week especially egg yolk (table 4), the highest percentage (80.8%) of study sample who take supplements during pregnancy (table 4), the highest percentage (55.8%) of study sample who eat fish at least twice a week (table 4), the highest percentage (54%) of study sample who prefer to wear dark clothing (table 4), the highest percentage (42.5%) of study sample who exposed to the sun for certain hours a day (table 4). Relative to subject "Women's Age", studied sample are focused at the three age groups, bounded (22 - 34) years, and they are accounted 90(75%) with mean and standard deviation 28.14, and 6.14 yrs. respectively, then followed by subject "Marriage years", which shows that studied sample are focused at the first three groups, bounded (<5 - 14) yrs, and they are accounted 105(87.5%) with mean and standard deviation 8.53, and 4.84 yrs. respectively. 8(6.7%) of studied sample are not the lonely wife includes, as well as most of them are selected from urban residents and accounted 109(90.8%). Results shows that "Socio-Economic Status" accounted through applying of WHO instrument, which consists of several components such that, occupation, education levels, crowding index, and a particular properties (House ownership, possession car, available of specific requisite materiel). Three social and economical levels represented by the preceding contents (Low, Moderate, and High). Vast majority of studied sample had low evaluated, and they accounted 105(87.5%), and the leftover had moderate, and accounted 15(12.5%). According to preceding results, vitamin D deficiency regarding pregnant woman can be considered as indigent disease classified. Table (2) shows the observed frequencies, and percents of the studied "Reproductive Health Side" parameters, such that "Number of pregnancies, Number of abortions, Number of living children, Number of stillbirths, Type of delivery, Type of feeding, Breastfeeding period, Fetal birth defects, Size of fetus normal or abnormal, and size of head's fetus normal or abnormal", with their comparisons significant, to explore behavior of studied parameters either they randomly or none randomly distributed comparing with their an expected outcomes, which showed that significant differences in at least at $P<0.05$ among different classes of that parameters. Relative to subject of "Number of pregnancies", studied sample are focused mostly at the first three classes, and they are accounted 110(91.7%). Results shows that "Number of Abortions", recorded vast majority with who had one time, and they accounted 30(25%). Number of living children are focused mainly at the first class, and they are accounted 61(50.5%), then followed by the number of stillbirths for who had applicable are focused at only, and are accounted 17(14.2%). Delivery type of

cesarean from a total sample are formed 52(43.3%). Among studied sample, 42(35%) using artificial feeding, and among breast feeding women, 26(57.8%) reported feeding period less than or up to one year. 10(8.3%) who has fetal birth defective, and the same percent for whom had abnormal size fetal, as well as 7(5.8%) registered for who had abnormal head's size. Table (3) show descriptive statistics regarding medical information for effectiveness of vitamin D deficiency in pregnant woman, such that "Frequencies, and percents, Mean of score, Standard deviation, Relative sufficiency", as well as comparisons significant. Results shows that an overall evaluations of medical information, as well as personal style side and reproductive health side are reported no significant relationships at P>0.05, except with number of pregnancies, type of delivery, and breastfeed period concerning medical information which shows significant relationship at p<0.05.

Table 1. Descriptive Statistics of Socio-Demographical Characteristics variables for studied women

SDCv.	Groups	No.	Percent
Women's age	< 20	7	5.8
	20 - 24	31	25.8
	25 - 29	34	28.3
	30 - 34	25	20.8
	35 - 39	17	14.2
	40 >	6	5
	Mean ± SD	28.14 ± 6.14	
Marriage years	< 5	28	23.3
	5 - 9	43	35.8
	10 - 14	34	28.3
	15 >	15	12.5
	Mean ± SD	8.53 ± 4.84	
Wife's Plurality	No	112	93.3
	Yes	8	6.7
Residency	Urban	109	90.8
	Rural	11	9.2
Socio-Economic Status	Low : 89 - & less	105	87.5
	Mod. : 90 - 120	15	12.5
	High :121 - 150	0	0.0

Table 2. Distribution of studied Reproductive Information Parameters with comparisons significant

Reproductive Health Side	Groups	No.	Percent	C.S. (*) P-value
Number of pregnancies	< 3	29	24.2	χ^2 = 22.733 P=0.000 (HS)
	3 - 4	46	38.3	
	5 - 6	35	29.2	
	6 >	10	8.3	
Number of abortions	Non applicable	76	63.3	Binomial P=0.024 (S)
	Once a time	30	25	
	Twice a time and more	14	11.7	
Number of living children	Non applicable	12	10	χ^2 = 37.722 P=0.000 (HS)
	< 3	61	50.8	
	3 - 4	38	31.7	
	5 >	9	7.5	

Table 2. Distribution of studied Reproductive Information Parameters with comparisons significant

Number of stillbirths	Non applicable	101	84.2	χ^2 = 11.842 P=0.001 (HS)
	Once a time	17	14.2	
	Twice a time and more	2	1.7	
Type of delivery	Non Applicable	12	10	χ^2 = 40.267 P=0.000 (HS)
	Normal	42	35	
	Cesarean	52	43.3	
	Both	14	11.7	
Type of feeding	Non Applicable	12	10	χ^2 = 25.800 P=0.000 (HS)
	Natural	45	37.5	
	Artificial	42	35	
	Both	21	17.5	
If you answer breastfeeding what is your breastfeeding period's monthly?	Non applicable	54	45	Binomial P=0.110 (NS)
	Up to 12 m.	26	21.7	
	> 12 - 24 m.	40	33.3	

Table 3. Distribution of Medical Information with Comparisons Significant

The Medical Information	**Resp.**	**No.**	**%**	**MS**	**SD**	**RS**	**C.S.** (*)
Do you suffer from pain in the bones especially the bones spine and femoral ?	No	47	39.2	0.61	0.49	61.0	P=0.022 S
	Yes	73	60.8				
Have you had broken limbs ?	No	98	81.7	0.18	0.39	18.0	P=0.000 HS
	Yes	22	18.3				
Do you have diseases in the joints and Spine (sliding in the joints) ?	No	89	74.2	0.26	0.44	26.0	P=0.000 HS
	Yes	31	25.8				
Do you have difficulty getting up when you sit down ?	No	41	34.2	0.66	0.48	66.0	P=0.001 HS
	Yes	79	65.8				
Do you have difficulty when you boarding stairs ?	No	39	32.5	0.67	0.47	67.00	P=0.000 HS
	Yes	81	67.5				
Do you have difficulty washing your head ?	No	61	50.8	0.49	0.50	49.0	P=0.927 NS
	Yes	59	49.2				
Do you suffer from hair loss ?	No	25	20.8	0.79	0.41	79.0	P=0.000 HS
	Yes	95	79.2				
Do you have problems with your gums and teeth ?	No	43	35.8	0.64	0.48	64.0	P=0.003 HS
	Yes	77	64.2				
Do you suffer of diabetic ?	No	116	96.7	0.03	0.18	3.30	P=0.000 HS
	Yes	4	3.3				
Do you suffer of chronic kidney failure?	No	102	85	0.15	0.36	15.0	P=0.000 HS
	Yes	18	15				
Do you suffer of cardiac problems ?	No	86	71.7	0.28	0.45	28.0	P=0.000 HS
	Yes	34	28.3				
Do you suffer of chronic liver failure ?	No	120	100	0.00	0.00	0.00	P=0.000 HS
	Yes	0	0				

Table 4. Distribution of Personal Style Side with Comparisons Significant

The Personal Style Side	Resp.	No.	%	MS	SD	RS	C.S. (*)
Do you drink milk daily ?	No	98	81.7	0.18	0.39	18.0	P=0.000 HS
	Yes	22	18.3				
Do you eat fish at least twice a week ?	No	53	44.2	0.56	0.50	56.0	P=0.235 NS
	Yes	67	55.8				
Do you eat eggs twice a week, especially egg yolk ?	No	20	16.7	0.83	0.37	83.0	P=0.000 HS
	Yes	100	83.3				
Are you exposed to the sun for certain hours a day?	No	69	57.5	0.42	0.50	42.0	P=0.121 HS
	Yes	51	42.5				
Would you prefer to wear light clothing?	No	11	9.2	0.91	0.29	91.0	P=0.000 HS
	Yes	109	90.8				
Would you prefer to wear dark clothing?	No	55	45.8	0.54	0.50	54.0	P=0.411 NS
	Yes	65	54.2				
Do you take supplements during pregnancy ?	No	23	19.2	0.81	0.40	81.0	P=0.000 HS
	Yes	97	80.8				

Table 5. Distribution of Medical Information with Comparisons Significant and relationships an overall evaluation of medical information, as well as personal style side and SDCv.

Main Domains	No.	PGMS	PPSD	Evaluation Positive %
Medical Information	120	42.857	16.225	57.78 (Pass)
Personal Style Side	120	60.833	16.512	60.833 (Pass)
SDCv.	Medical Information		Personal Style Side	
	C.C.	P-value	C.C.	P-value
Women Age	0.231	0.239 (NS)	0.083	0.975 (NS)
Marriage years	0.281	0.061 (S)	0.161	0.362 (NS)
Wife's Plurality	0.054	0.551 (NS)	0.093	0.304 (NS)
Educational level	0.164	0.653 (NS)	0.192	0.464 (NS)
Occupation	0.110	0.227 (NS)	0.025	0.780 (NS)
Residency	0.007	0.935 (NS)	0.057	0.535 (NS)
Socio-Economic Status	0.042	0.646 (NS)	0.014	0.878 (NS)

Table 6. Relationships an overall evaluation of medical information, as well as personal style side and reproductive health side

Reproductive Health Side	Medical Information		Personal Style Side	
	C.C.	P-value	C.C.	P-value
Number of pregnancies	0.277	0.019 (S)	0.138	0.504 (NS)
Number of abortions	0.258	0.077 (NS)	0.121	0.420 (NS)
Number of living children	0.159	0.248 (NS)	0.190	0.131 (NS)
Number of stillbirths	0.055	0.811 (NS)	0.201	0.372 (NS)
Type of delivery	0.250	0.027 (S)	0.050	0.872 (NS)
Type of feeding	0.007	0.935 (NS)	0.057	0.535 (NS)
Fetal Birth Defects	0.066	0.487 (NS)	0.100	0.286 (NS)
Breastfeed period	0.213	0.017 (S)	0.114	0.350 (NS)
Size of Fetus	0.143	0.112 (NS)	0.056	0.541 (NS)
Size of Head's Fetus	0.080	0.380 (NS)	0.001	0.989 (NS)

CONCLUSION

Approximately third of the study samples their age group (22-34) years, more than third study samples years of marriage are ranging between (5-9) years, more than three forth of the study samples their socio-economic levels were low, more than third of study sample for the ratio of the number of pregnancies to the group (3-4) times, third of study sample for the number of abortions, half of than third study samples years of marriage are ranging between (5-9) years, study sample for number of living children, more than third of study sample for delivery type of cesarean, more than half of study sample for using breastfeeding reported feeding period less than or up to one year, more than three fourth of study sample who suffer from hair loss, more than tow third of study sample who suffer from difficulty boarding stairs, more than tow third of study sample who suffer from difficulty to getting up after sitting position.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of AL-Nahrain, Health Center, Iraq and all experiments were carried out in accordance with approved guidelines.

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Environmental Assessment of the Quality of Water and the Hydrochemical Formula Used for Some Groundwater Wells in Karbala Governorate

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ABSTRACT

The ground water in the study area is classified according to the total dissolved solids it is concluded that the water in the type is brackish water. The electrical conductivity in water of the study area is Excessively Mineralized Water. The study found that there is an increase in the concentrations of positive and negative different ions such as calcium, magnesium, sodium, potassium, sulfate, chloride, carbonates, bicarbonates and nitrates due to natural and anthropogenic [1]. The Hydro chemical Formula and Water Type is the quality of the prevailing water is NaSO4- in the wells of the study area. The study found that when comparing the results of the research with the global measurements, the water type is not suitable for human consumption. Regarding the drinking of animals, it is found that it is suitable for consumption. When compared to industrial use, it was found to be unfit for industry. As for the construction found useful for use. Their use to irrigate irrigation is not useful.

Keyword: *Hydrochemical Formula, Assessment, Groundwater*

INTRODUCTION

Water is considered as the origin of life. It represents the most important agent of natural resources over the earth. Water as a part of our environment has a capacity to fill human needs for aesthetic appreciation. Due to the present conditions in Iraq, which are characterized by a shortage of surface water supply as a result of retaining water of the Tigris and Euphrates Rivers within the neighboring countries [1]. In addition to the dry conditions during the present period which started some years ago. There is a need to search and find other sources of water supply from ground water resource on regional scale, The study area is located in the Mesopotamia Plain and 105 km from Baghdad in the south-west and is confined between the eastern latitudes (44 ° 40 54- 43 ° 54 °10) and north latitude (32 ° 21 42-32 ° 40 °54). It is located on the edge of the desert in the west of the Euphrates and on the left side of the Husseiniya plateau, bordered to the north and west by Anbar province and from the south by the province of Najaf and from the east by Babil Province. Aim of the study: Studying the hydrochemical properties of groundwater in Karbala governorate and the nature of this water. Determination of the validity of groundwater for different uses by comparing them with the Iraqi and global determinants.

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METHODOLOGY

GEOLOGY OF THE STUDY AREA

1-Stratigraphy

More than 80% of the map area is covered by Quaternary sediments. Pre- Quaternary exposed rocks are represented by Dammam, Euphrates, Nfayil, Injana, Zahra and Dibdibba formations, with age ranges from Eocene to Pliocene-Pleistocene. While the studied unexposed formations within the map area are indicated by. Umm Er Radhuma Formation and Tayarat Formation

ground surface [2].

2-Exposed Formation

The following formations are exposed in the map area:

Dammam Formation (Eocene)

Dammam Formation is composed of variable carbonate rocks mainly limestone, dolomitic limestone and dolomite, with marl. It is characterized by the presence of cavities, fractures, fissures and joints [3]. The depositional environment is marine water of open platform.

Euphrates Formation (Lower Miocene)

The Euphrates Formation is exposed in several localities and consists of basal breccia, limestone and marl. The matrix is composed of carbonate material with some clayey and sandy admixture [3].

Nfayil Formation (Middle Miocene)

The Nfayil Formation is exposed in the southern and western parts of area. Generally, consists of sandy dolomitic and gypseous marl with inter bedded calcareous, sandy claystone, fossiliferous limestone and sandstone, with limestone intercalations.

The Injana Formation is exposed along both ridges of Tar Al-Najaf and Tar Al-Sayid, and in the eastern bank of Al-Razzaza Lake. It consists of silty, sandy calcareous claystone and sandstone.

Zahra Formation (Pliocene – Pleistocene)

The Zahra Formation is exposed as spot scanty, cropping out southwest, and south of Al-Razzaza Lake. It is composed mainly of calcareous sandstone, sandy carbonate and sandy and chalky limestone.

Dibdibba Formation (Pliocene - Pleistocene)

The Dibdibba Formation is well exposed along both ridges of Tar Al- Najaf and Tar Al-Sayid, occupying the top most part of the exposed sequence, forming the top rock of the plateau between Karbala and Najaf.

1-Laboratory work

The Hydrochemical study of the candidate water within the study area included the analysis of well water (20) wells, which ranged between (6 - 272) meters for the season of water increase. The positive ions (K +, Na +, Mg2+ , Ca2+) and negative ions (, , -Cl ,) , As well as (pH), electrical conductivity (E.C.), total dissolved salts (T.D.S.).Tests were conducted in the General Authority for Drilling of Wells and Groundwater of the Ministry of Water Resources

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$$(SO_4^{2-} , HCO_3^- , -Cl, NO_3^-)$$

As well as (pH), electrical conductivity (E.C.), total dissolved salts (T.D.S.).

Tests were conducted in the General Authority for Drilling of Wells and Groundwater of the Ministry of Water Resources.

Hydrochemistry of groundwater The chemical composition of groundwater is the double result of water entering the groundwater reservoir and the interactions with the rocks containing different minerals[5].

Physical Properties

1- Hydrogen ion concentration (pH)

The maximum pH values we rerecorded in well (3) were (7.8) .and minimum values were (7.1) in well (10) and the mean (2155.6). The pH of water is controlled by the equilibrium achieved by dissolved compounds in the system. In natural waters. Table 2

2- Total Dissolved Solids (TDS)

The maximum TDS values were recorded in well (6) (40000 mg/L) and, the minimum value was recorded in well (1) (1070 mg/L). By comparing the TDS values with those reported by (6), it is concluded that the water in the type is brackish water also by (7),(8) and (9).

3-Electrical conductivity (EC)

In water of the study area, EC ranges from 1400 – 11970µs/cm with 3877 µs/cm in average When comparing what exists in 18 we note that The relationship between electrical conductivity and mineralization Located within Excessively Mineralized Water.

Major Ions

1-Calcium ion (Ca^{2+})

. The highest concentration of calcium ion in the water of the study area was 612 mg / l in well (10), while the lowest concentration of calcium was (70) mg / L in well (8). The overall concentration of calcium was 264.05 mg / l. Figure (1) shows that all groundwater models in the study area exceeded the permissible drinking water limit of 75 mg / l according to international standards [10]. The increase in the concentration of calcium in the water of the study area is due to the effect the process of ion exchange between sodium and calcium.

2-Magnesium ion (Mg^{2+})

The results of Table 2. showed that the highest concentration of magnesium ion in the water of the study area was (305) mg / L in well (1) while the lowest concentration of magnesium (66) mg / L in well (8). The overall concentration of magnesium in the studied aquatic models was 142.5 mg / L. The high concentration of magnesium ion in the water of these regions is due to the effect of the ion exchange process and the effect of evaporation processes.

3-Sodium (Na^{+})

. The highest concentration of sodium in the water of the study area was (1020) mg / L in well (1), while the lowest concentration was (85) mg / L in well (8). The general rate of sodium concentration in aquatic models (332.74) The high concentration of sodium in water is due to the dissolving of sodium salts concentrated in the soil as a result of watering of plants. Household cleaning agents also increase sodium as a result of containing sodium hypochlorite, which is transferred from the sewage system to the groundwater system by means of dispersion.

4-Potassium (K^{+})

The highest concentration of potassium ions in the water of the study area was (120) mg / L in well (19) while the lowest concentration of potassium (3.5) mg / l in well (4). The overall concentration of potassium in the water of the study area was 53.01 mg/l

Anions

1-Sulfates (SO4)

The water of the study area is characterized by the abundance of sulphates where the highest concentration of sulphate (2349) mg / l in well (1) (2.35). The lowest concentration of sulphate was (375) mg / l in well (8). The total sulfur concentration in the water of the study area was 954 mg / l. Figure (2) shows that all candidate water models in the study area exceeded the drinking water limit of 12 mg / l according to international standards (11). The high concentration of sulphate in the water of the study area is due to the presence of sulfur salts in the soil, as well as the presence of secondary gypsum.

2-Carbonates (CO3) and bicarbonates (HCO3)

The highest concentration of bicarbonate ion in the water of the study area was (979) mg / L in well (1), while the lowest concentration of bicarbonate (50) mg / l in well (6). The overall rate of bicarbonate was 363.65 mg / l. The increased concentration of bicarbonates in these waters resulted in the melting of sodium bicarbonate in the soil due to irrigation processes, as well as the effect of wastewater through the drainage system in these areas.

4-Chloride (Cl)

Table (3) shows that the highest concentration of chloride in the water of the study area was (1328) mg / L in well (1), while the lowest concentration of chloride was 176 mg / l in well (16). The chloride concentration in the water area of the study area was 598.5 mg / l .

5-Nitrate (NO3)

The lowest concentration was (0) mg / L in well (12). The overall nitrate concentration in the studied aquatic models was 4.29 mg / l. It should be noted that all candidate water models in the study area fall within the permitted drinking water limit of 50 mg / L according to international standards (10).

Hydrochemical Formula and Water Type

The hydrochemical formula of water can be determined by taking the concentrations of main cations and anions in (meq %) (mill equivalent percent) in water with total dissolved solids concentration (TDS) as (mg/l) or (g/l).

The hydrogeological formula of the study area was as follows:

	SO_4^{2-}	Cl^-		
T.D.S.	40.55	39.48		pH
4911.5	38.60	30.09	27.54	6.21
	Na+	**Ca2+**	**Mg2+**	

The water quality can be determined by positive and negative ions in units of epm% whose concentration is greater than 15% by placing the negative and positive ions on their decreasing concentrations

Na+ - Ca2+ - Mg2+ - Cl- - So42-

So the quality of the prevailing water is NaSO4- in the wells of the study area Table (3) shows the hydrocochemical formula and the water type in the study area. Four types of water are shown: Sodium sulphate (1, 2, 4, 5, 9, 10, 11, 1213,14 ,,, 18,19) And calcium sulphate represent the well (20). Calcium chloride represents the two wells (3, 15), indicating that sulphates are predominant in the sense of negative ions, while sodium ions (6, 7, 8,) Is predominant for positive ions in most water models studied.

Table 1. The location of the study wells

Side	Location	Date of excavation	Depth meters	Latitude	Longitude	Well number
ALHOR	Razzaza Forest Project	1-3-2014	48	324054.2	435410.6	1
ALHOR	Qassem Abboud	1-3-2014	25	323955.3	435745.2	2
ALHOR	Ali Hussein / 2	1-3-2014	18	324030.4	435717.4	3
Husseiniya / Black innovation	Sayed Mahdi	1-3-2014	25	323440.9	435735.3	4
Husseiniya / Black innovation	Hussein Odeh Al-Ghanmi / 1	1-3-2014	40	323418.7	435729.0	5
Husseiniya / Black innovation	Hamza Farhan Abdul Hussein	2-3-2014	6	32412.30N	44417.10E	6
ALH0R / Habbaniyah	Hussain Sabah Hussein	2-3-2014	11	32422.90N	44149.10E	7
Husseiniya	Mohamed Adab	2-3-2014	2.0	32418.70N	443060E	8
Husseiniya	Metzraflah / 2	2-3-2014	40	32339.99N	44046.03E	9
Husseiniya	Jaber Haddam/1	2-3-2014	64	322737.20N	44133.50E	10
Husseiniya / Black innovation	Hadi Abdul / 2	3-3-214	65	322612	440256	11
Husseiniya / Black innovation	Mustafa Karbala / 2	3-3-214	257	32º2134	440554	12
Husseiniya / Black innovation	Kassem Kokz	3-3-214	54	322532	440610	13
Alraehbeaa	Khalf daib	3-3-214	50	322548	440605	14

Cont... **Table 1. The location of the study wells**

Alraehbeaa	Abdallah	3-3-214	45	322559	440632	15
Khassef	Mohsen Karim Alwan	4-3-2014	6	324059.2	440431.5	16
Husseiniya	Majid Hamid Ali	4-3-2014	6	324059.4	440433.4	17
Husseiniya	Abdulmam Amhourd	4-3-2014	9	324116.6	440509.8	18
Allhaerat	Hussein Kazem	4-3-2014	60	322129	441215	19
Allhaerat	Mohamed Fadel	4-3-2014	-	322142	441130	20

Table 2. Explains the physical properties of the wells of the study area

No. of well	pH	Ec (µS/cm)	T.D.S. (µg/l)
1	7.24	11970	7727
2	7.12	5300	3500
3	7.81	5160	3550
4	7.12	3430	2502
5	7.20	3870	2867
6	7.31	1427	1070
7	7.24	2510	1956
8	7.18	1400	1095
9	7.18	4120	7686
10	7.10	4020	3000
11	7.61	3910	2932
12	7.21	4240	3963
13	7.31	3490	2685
14	7.30	3530	2900
15	7.20	3940	2617
16	7.41	1257	1100
17	7.3	1768	1280
18	7.41	5290	40000
19	7.30	4500	3900
20	7.77	2410	1900
Range	7.1-7.81	1400-11970	1070-40000
Mean	7.32	3877.1	4911.5

Table 3. Shows the hydrocochemical formula and water type in the study area.

Well No.	Hydro chemical Formula	Water Type
	TDS (7727) 7.24pH	Na – Ca – Mg – Cl – So4
	TDS (3500) 7.12pH	Na – Ca – Mg – Cl – So4
	TDS (3550) 7.81pH	Ca –Mg – Na – So4 – Cl
	TDS (2502) 7.12pH	Na – Ca – Mg – Cl – So4
	TDS (2867) 7. 2pH	Na – Ca – Mg – Cl – So4
	TDS (1070) 7.31pH	Mg – Ca – Na –Cl – So4
	TDS (1956) 7.24pH	Mg – Ca – Na –Cl – So4
	TDS (1095) 7.18pH	Mg – Na –Ca –Cl – So4
	TDS (7686) 7.18pH	Na – Ca –Mg –Cl – So4
	TDS (3000) 7.1pH	Na– Ca –Mg –Cl – So4
	TDS (2932) 7.61PpH	Na – Ca –Mg –Cl – So4
	TDS (3963) 7.21pH	Na –Mg– Ca –Cl – So4
	TDS (2685) 7.31pH	Na –Mg– Ca –Cl – So4
	TDS (2900) 7.3pH	Na – Ca –Mg –Cl – So4
	TDS (2617) 7.2pH	Ca –Mg – Na – So4 – Cl
	TDS (1100) 7.41pH	Mg – Ca – Na – Cl– So4
	TDS (1280) 7.3pH	Mg – Ca – Na – Cl – So4
	TDS (40000) 7.41pH	Na– Ca –Mg –Cl – So4
	TDS (3900) 7.3pH	Na– Ca –Mg –Cl – So4
	TDS (1900) 7.77pH	Ca –Mg – Na – So4 – Cl

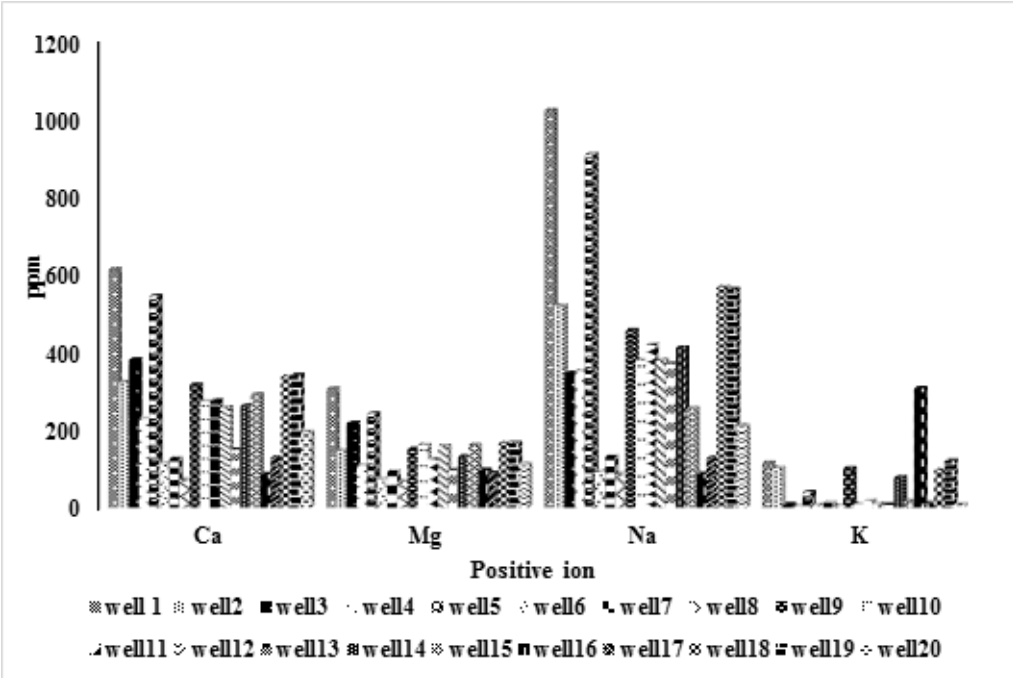

Figure 1. Shows positive ion concentrations in the study area

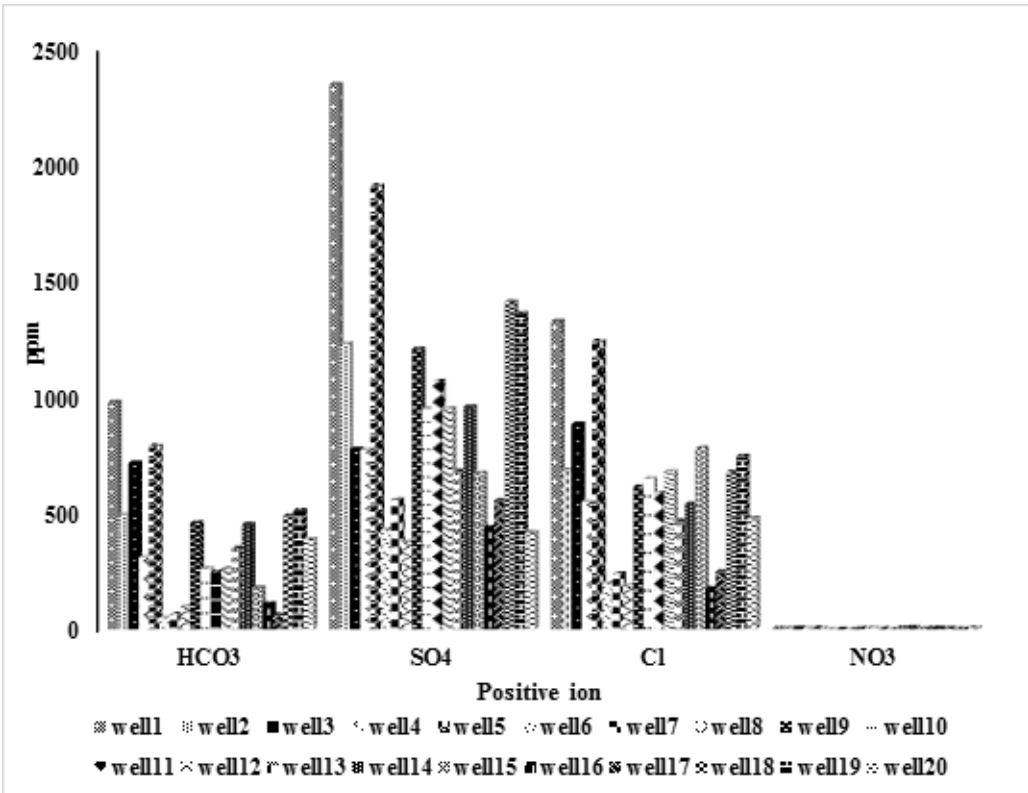

Figure 2. Shows the concentrations of negative ions in the study area

CONCLUSION

The Hydro chemical Formula and Water Type is the quality of the prevailing water is NaSO4- in the wells of the study area. The study found that when comparing the results of the research with the global measurements, the water type is not suitable for human consumption. Regarding the drinking of animals, it is found that it is suitable for consumption. When compared to industrial

use, it was found to be unfit for industry. As for the construction found useful for use. Their use to irrigate irrigation is not useful.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Education for Pure Science (Ibn Al-Haitham), University of Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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Effectiveaness of an Educational Program on Nurses' Knowledge toward Restraint and Seclusion for inpatients at Psychiatric Teaching Hospitals

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ABSTRACT

A quasi-experimental design is carried throughout the present study with the application of test-retest approach of pre-test, post-test I, and post-test II; for the study sample, the sample consisted of (25) nurse ((11) male and (14) female) were selected from AL-Rashad Psychiatric Teaching Hospital in Baghdad City, during the period of 1st November 2017 to 16th September 2018. In the pre-test; post-test design in the dependent variable is measured before implementing the program and two after implementing the program for nurses. The data was collected by questionnaire which consisted of two parts, first part consists socio demographic data, Second part is about restraint and seclusion which designed through the use of multiple choice question, a numerical value was given to each rating point; (1) for right answer, and (0) for the wrong answer. In the present study, data were analyzed through the use of statistical package for social sciences (SPSS), version 21. The finding of the study indicated that The nurses had little training about how to deal with agitated patients in psychiatric wards. Most of the nurses who participated in the study have preparative school graduates, and they have an extremely low level of knowledge more than others.

Keyword: *educational Program, Knowledge, Restraint, and Seclusion.*

INTRODUCTION

Violence and aggressive behavior are major concerns in psychiatric wards and patients requiring admission often display agitated behavior which can put at risk the health and safety of the patients and the staff that supporting them. Concerns for patients and staff safety in acute settings have been expressed worldwide [1]. Violence and aggressive behavior is common, especially in mental health settings, In clinical practice, restrictive measures (restraint and seclusion) might partially prevent unwanted behaviors, but do not fully eliminate them, at least when used independently [1]. Psychotic behaviors are the most frequent reasons for using patient restrictive measures (restraint and seclusion) even without any signs of potential violence [12]. The National Institute for Mental Health in England[(18)] and the National Institute for Health and Clinical Excellence [18] have published guidelines emphasizes the importance of using preventive measures to manage violent behavior in healthcare, highlighting safety priorities in mental health. [(20)], despite the fact that studies have reported quite similar reasons for restraint and seclusion. These reasons include threats or use of violence against oneself or other people, attempts to escape, aggression towards property, inability to care for oneself and agitation/disorientation [15]. Although coercive interventions (restraint and seclusion) can be effective as a last resort in preventing injury to patients and maintaining their security [5]. Thus the use of this interventions (restraint and seclusion) is one of the indicators of the quality of psychiatric treatment in hospitalized patients [9]. The use of seclusion and restraint in psychiatric practice is a controversial issue in the hospitals of Iraq, as a recent study have shown seclusion to be a predominant restrictive measure. In contrast to many surrounding countries, in this study a psycho-educational program is arranged in such a way that the protection of the physical integrity of the patient is more important than professional considerations with respect to the treatment of severe mental illness. Despite its importance, there is no studies in Iraq have been conducted on the use of restraint and seclusion in psychiatric practice. Lack of knowledge or understanding of alternatives to restraint has been identified as a barrier

to reducing these measures [4]. Other barriers include staff and resource limitations, environmental constraints, policy and management issues, beliefs and expectations of staff, inadequate review practices and communication barriers. Psychiatric nurses are one of the most important groups who have a significant role in providing care for psychiatric patients. Because of the nature of the nursing profession, psychiatric nurses are the first people who are in contact with psychiatric patients. The role of them in this condition is to help the patients understand and control on their violence and aggression. We conducted this study because the nursing staff has the primary role in carrying out the practical procedure. The psychiatric nursing needing for novel and effective methods to address violence and aggressive behavior of patients on psychiatric wards. And to increase nurses' knowledge and experiences of restraint and seclusion with psychiatric patients in hospitals, and how these experiences are applied. Objectives of the study: To identify the effectiveness of an educational program on the nurses' knowledge for the study sample. Compare the levels of nurses' knowledge before and after the educational program.

METHODOLOGY

Study Design and Study Sample: A quasi-experimental design is carried throughout the present study with the application of test-retest approach of pre-test, post-test I, and post-test II; for the study sample, the sample consisted of (25) nurse ((11) male and (14) female) were selected from AL-Rashad Psychiatric Teaching Hospital in Baghdad City, during the period of 1st November 2017 to 16th June 2018. In the pre-test; post-test design in the dependent variable is measured before implementing the program and two after implementing the program for nurses. The questionnaire consisted of three parts:

Part 1: covering letters to obtain the agreements of the nurses to participate in the present study.

Part 2: socio-demographic data sheet contains information regarding; Gender, age, level of education, years of experience in nursing, and years of experience in psychiatric field. **Part 3:** This part of the questionnaire includes the knowledge about the restraint and seclusion: it consist of (50) items scale of knowledge about restraint and seclusion.

Part 4: The educational program is the most important part in this study because it measure the nurses' information. The researcher focuses and depending on books, researches, and WHO reports talk about the subject for constructing the program.

Data Collection: The data collection was carried out from February 15th 2018 to September 13th 2018. Data was collected after obtaining the permission from the Directorate of Hospitals. The researcher met each nurse staff of the study for explain the objectives of the study, then filled by the nurses. All the (participants) nursing staff of the study both groups (25 study group) are exposed to pre-test, to determine their performance in the restraint and seclusion. The participants need approximately (30) minutes to complete all items of the questionnaire. All the nursing staff of the study group is exposed to the educational program at AL-Rashad Psychiatric Teaching Hospital, and exposed to the first post-test after the educational program was finished immediately to measure changes in their knowledge regarding restraint and seclusion. And all the participants of study group are exposed to the second post-test after three months of the first post-test to measure changes in their knowledge regarding restraint and seclusion.

Data analysis: The domain is designed through the use of multiple choice question, a numerical value was given to each rating point; (1) for right answer, and (0) for the wrong answer. In the present study, data were analyzed through the use of statistical package for social sciences (SPSS), version 21.

RESULTS AND DISCUSSION

In the present study, data were analyzed: Regarding gender the table shows that the highest percentage of the participants (56.0%) were females. According the age (48.0%) were at age group between (30-39 years). For the level of education (64.0%) of the sample are from the preparative nursing schools. Also the table reveals that the highest percentage of the sample (56.0%) were experience in nursing at period ranging (1-5 years). And for the years of experience in psychiatric field (76.0%) of the sample were ranging from (1-5 years). The study sample have extremely low and low levels of knowledge; (80.0%) (n= 20) and (20.0%) (n= 5) in phase one; while have low, intermediate and good (20.0%) (n= 5), (44.0%) (n= 11) and (36.0%) (n= 9) at phase two, and at phase three the participants of the study group have low, intermediate and good levels of knowledge;

(12.0%) (n=3), (52.0%) (n= 13) and (36.0%) (n= 9). The table indicates that a non- significant relationship between demographic characteristics and knowledge about restraint and seclusion for the study sample. The results of table 4. show that:

1- The within subjects test indicates that the interaction of time and group is significant (F= 164.349, p= 0.00).

2- The main effect of time is significant (F= 131.493, p= 0.00).

3- The between groups test indicates that there the variable group is significant F= 164.349, p= 0.00). The significant interaction indicates that the male group and female group are changing over time and they are changing in different ways, in other words, in the figure 1 the lines of the two groups are not parallel. In the figure 1 for this particular situation it is clear that the male group is increasing in knowledge over time and the female group is increasing in knowledge over time. Regarding the differences in the knowledge about restraint and seclusion within the three phases (table 5) indicates that there is a high significant differences in levels of knowledge between phase one and phase two (sig.= 0.00) and phase three (sig.= 0.00). This result shows that there is a changing in levels of knowledge between phase one and phase two and phase three. This table shows also that there is no change in levels of total knowledge between phase two and phase three (sig.= 0.33). The result of the study showed that participants of both gender were males 44.0% and females 56.0% who are participated in the study. This results is disagree with Yas [25] who stated that there is a shortage of female nurses who are working in the psychiatric hospitals. Also the (table 1) indicated that the age of the study sample, most of them 48.0% were at age (30-39) years old; these findings agree with the results of Mohammed [17] who has reported that most common age is around (30-39). This is considered this group of age for the sample is the productive age of the person and it is more preferred than other age to work in psychiatric hospitals to be able give care to psychiatric patients. According to the nurses' education levels, the study has showed that the majority of them 64.0% were preparative school graduates and most of them female. This level of study is in Iraq only because of the urgent need for nurses working in hospitals for the shortage of nursing staff in general, which caused the opening of a number of nursing preparative schools for female to plug the shortage of the nursing staff, including mental hospitals. These results disagree with the findings of Mohammed[17] who reported in his study that 41.0% were medical institution group who participated in his study. The table shows that the highest percentage of the study sample 56.0% were having (1-5) years of experience in nursing. These results coincide with the findings of Mohammed[17] who has reported (1-9) years that most common years of experience in nursing for his study are 55.2%. This can be explained by the fact that new nurses have been appointed because of the need for nurses to work in this field (nursing field) in this hospitals because of increasing the number of admitted psychiatric patients to the hospitals. According to the nurses' years of experience in psychiatric field, the results show that majority of them 76.0% are having (1-5) years of experience in psychiatric field. There was major increase in the level of knowledge for both groups who are participated in the program and they were keen to join in all sessions of the program and reacted well to what they heard in these sessions (Table 4, & 5; Figure 1). This study is the first study in Iraq that includes an assessment of nurses' knowledge regarding restraint and seclusion, and the effect of educational program for these nurses.

Table 1. Distribution of the nurses according to their sociodemographic data

Demographic		**F**	**%**
Gender	Male	11	44.0
	Female	14	56.0
	Total	25	100.0
Age	20-29 years	10	40.0
	30-39 years	12	48.0
	40-49 years	2	8.0
	More than 49 years	1	4.0
	Total	25	100.0

Cont... **Table 1. Distribution of the nurses according to their sociodemographic data**

Level of Education	Preparative	16	64.0
	Institution	0	0.0
	College	9	36.0
	Total	25	100.0
Years of Experience in Nursing.	1 - 5	14	56.0
	6 - 10	4	16.0
	11 - 15	5	20.0
	16 – 20	1	4.0
	More than 20	1	4.0
	Total	25	100.0
years of Experience in psychiatric field	1 - 5	19	76.0
	6 - 10	3	12.0
	11 - 15	3	12.0
	More than 16	0	0.0
	Total	25	100.0

Table 2. Distribution in levels of Knowledge according to Study Sample for three Phases.

Knowledge											
Phases	**No.**	**Levels of Knowledge**								**Total**	
		Extremely Low		**Low**		**Intermediate**		**Good**			
		f	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**
One	25	20	80.0%	5	20.0%	0	0.0%	0	0.0%	25	100.0%
Two		0	0.0%	5	20.0%	11	44.0%	9	36.0%	25	100.0%
Three		0	0.0%	3	12.0%	13	52.0%	9	36.0%	25	100.0%

Table 3. Association between demographic characteristics and Knowledge about Restraint and Seclusion for Study Sample

Correlation coefficient		
Variables	**Knowledge about restraint and seclusion**	
Demographics	*R*	*sig.*
Gender	-0.16	0.42
Age	0.11	0.58
Level of Education	0.23	0.25
Years of Experience	-0.11	0.59
Years of Experience in Psychiatric Field	-0.28	0.17

Table 4. Repeated Measures ANOVA Tests for nurses' knowledge about Restraint and Seclusion.

Knowledge	Repeated Measures ANOVA Tests			
	F	P	size effect (d)	Observed power
Main time effect	131.493	0.00	0.9	1.00
Between groups effect	83.168	0.00	0.7	1.00
Groups Interaction overtime	164.349	0.00	0.8	1.00
F= F- statistics, p= probability value				

Table 5. Differences within the Three Phases regarding nurses' knowledge about Restraint and Seclusion (Total Knowledge) by using Post hoc tests.

Pair-wise Comparisons (multiple comparisons: Bonferroni)				
(I) Knowledge	(J) Knowledge	Mean Difference (I-J)	Std. Error	Sig.
1	2	-1.96	0.16	0.00
	3	-2.05	0.16	0.00
2	1	1.96	0.16	0.00
	3	-0.09	0.21	1.00
3	1	2.05	0.16	0.00
	2	0.09	0.21	1.00

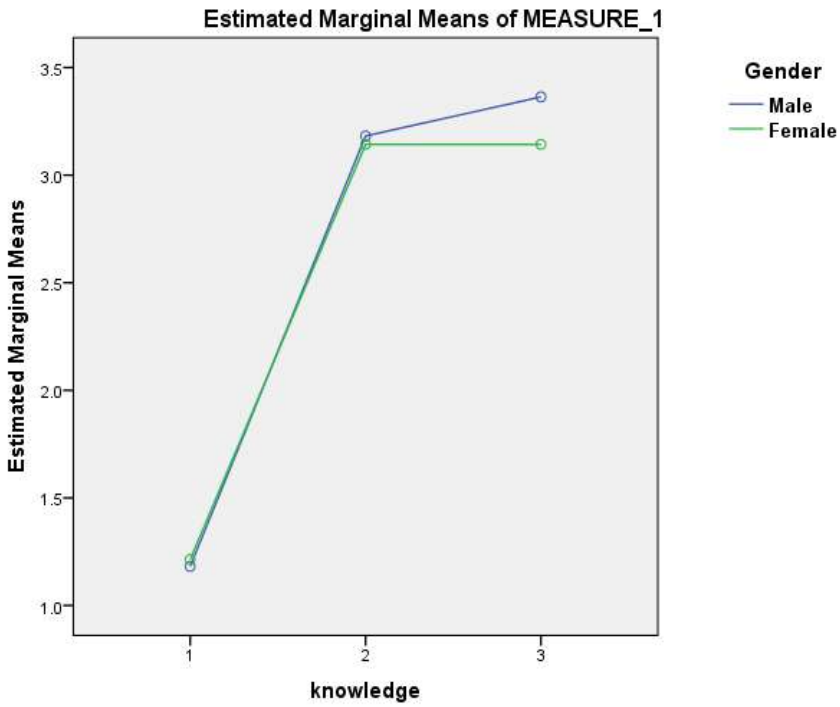

Figure 1. Changes in the levels of the nurses' knowledge about restraint and seclusion in the males group and females group throughout the three phases.

CONCLUSION

The nurses had little training about how to deal with agitated patients in psychiatric wards. Most of the nurses who participated in the study have preparative school graduates, and they have an extremely low level of knowledge more than others. The participants who spent (1- 5) years of experience in psychiatric field have an extremely low level of knowledge more than those who have more 5 years of experience in psychiatric field. The studied nurses confirmed that the study group have improve and increase in their awareness and level of knowledge about restraint and seclusion in phase two, and three. The educational program is effective to increase awareness and knowledge of the studied nurses about restraint and seclusion after its implementation.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Psychiatric and mental Health Nursing Department, College of Nursing, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Effect of Rainfall on the Ratio of Atmospheric Carbon Dioxide Drift for the 2015-2016 Season

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ABSTRACT

Carbon dioxide is one of the most important greenhouse gases that is increased in atmosphere by effect of human. These rates increase in the winter season while less when the plant began to grow, where withdraws this gas by photosynthesis. CO_2 is closely related to several elements of climate. CO_2 meter device was used at Mustansiriya station for the purpose to measure concentration of gas during the winter season for the period (14/12/2015 to 27/ 3/2016), before rain fell by observing the weather situation, 14 rain cases were recorded during this period. Rainfall data is measured use the automatic weather station located in the Department of Atmospheric Sciences, Collage of Science. The result shows that increasing in concentrations of gas that has been measured about the natural gas, where the concentration of CO_2 initial at the beginning of the rainy season is up to 450 $_{ppm}$ at the end of the winter, while it was about 350$_{ppm}$, External gas ratios by washing was high whenever the rainstorm is strong. The intensity of the gas flux is also increased by increasing the rain intensity I, so the rainy winter of Baghdad reduced the percentage of CO_2 in the atmosphere.

Keyword: *Washout, Wet deposition, Intensity of rain.*

INTRODUCTION

Atmosphere composed of several gases, nitrogen and oxygen occupy 98%, Argon occupy 1% and all other gases place small quantities usually they are not mentioned as percentage, but as units of part of a million (ppm) to describe gases with simple ratios in the atmosphere, including CO_2 and water vapor. Although the percentage of CO_2 does not exceed in some sources 0.035%, but these percentages in case of increasing the result of human activities, involve the use of fossil fuels as a source of energy and cement industry, which caused a large increase in gas rates. That is not less important than the increase caused by energy production and transportation, the danger of this increase in temperature rise as one of the most important greenhouse gases, causing global warming. Any increase in the proportions of this gas has great damage to the environment and human. Thus, there is a relationship between weather variables and percentage of increase or decrease of this gas and these most important variables rain. This study was to indicate whether there is a rain effect on the rates of presence of gas co_2 or not affected by the rain using the method of wet deposition of gases based on equations [1]. Drifting chemicals from the atmosphere either operations physical or methods of chemical transformations, If these substances are present in the atmosphere in large molecules or large droplets, the Physiological deposition to soils and vegetation and the sea may occur due to the deposition of gravity. Either small particles that have quicken deposition Neglected; it may be deposited into these surfaces with dispersion. Either Gas deposition occurs by adsorption to surfaces directly. These gaseous substances interact with other materials to form substances that are subsequently drifted. There are two kinds of deposition: The first type is dry deposition, which means that any physical drift process does not include precipitation. The second type is wet deposition, which refers to the processes in which atmospheric chemicals accumulate in the rain and snow and fog droplets. Wet deposition is drifting many chemicals from the atmosphere even gases. When these substances are combined with the droplets of water present in the cloud, this process is called deposition

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polluted rain (Rainout), but if the merger occurs under any cloud accompanied rain through the air toward the ground called this process deposition Washout [1]. The aim of this study is to find the effect of rain on the percentage of carbon dioxide in the atmosphere in the area of waziriya in Baghdad, depend on the idea of wet deposition of gases and calculate the proportion of gas after the rain and these ratios are strongly affected by the rainstorm.

MATERIALS AND METHODS

Drifting gases in the atmosphere, including carbon dioxide, are dissolution inside the rain drops that do not return to land. When equilibrium occurs, the chemical composition in the rain drops is given by Henry's law [2]

$$C_{water} = C_{(air)} / H \quad .... 1$$

Where, $C_{(water)}$: is the concentration of the dissolved chemical in the rain droplets , $C_{(air)}$: concentration of the gases in the air, H: Henry law constant has no units which equal a ratio (C_{water} / C_{air}).

The density of flux resulting from the gas dissolved coupled with rain falling given by equation [3]

$$F = C_{(water)} \times I = C_{(air)} \times I/H = C_{(air)} \times w_r \times I \quad .... 2$$

Where, F: density of flux is the density of any variable on the unit area, but here the intensity of the flood we mean the ratio of the dissolved gas concentration in the amount of rain.

I : rainfall rate in mm / hr, w_r is the external washing ratio and equal 1 for co2 gas, The outside washing coefficient ƛ for carbon dioxide is calculated by relation[4].

$$ƛ = (10^{-4}) (I^{0.53}) \quad .... 3$$

Where ƛ units S^{-1} It should be noted that the value of the observed range from ƛ

0.4×10^{-3} S^{-1} to 6×10^{-5} can guess the concentration of air after the end of each rainstorm, the drifting process of the first rank so dissolution equation

$$C_{(air)} = (Cair_o) e^{-t ƛ} \quad \textbf{..... 4}$$

Where t is the time per second so the amount of CO_2 externally washed and deposited on water complexes

$$C_{(airo)} - C_{(air)} = C_{(CO2)} \quad .....5$$

Dataset

It is known that CO_2 concentration depends on two factor, location and time such as day and night, summer and winter and agricultural and residential area. A device was used to measure carbon dioxide concentration before rain that is named CO_2 meter. It is a digital device has a ppm (part per million) range from (0 - 4000 units) and temperature range from 0 to 50 (C) or (F) at height varies from (0 - 9000 m) . Monitor the weather situation through the website of the General Authority for Aerial and Seismic Monitoring .The measurement of gas concentrations of co2 before the rain for the period 2015-2016. The station in the Department of Atmospheric Sciences Recorded 14 rain storms ranging from heavy to medium and weak. This station is located at a height of 50 meters above sea level, where the wazirya area in Baghdad is located 32 meters above sea level and the height of the building science faculty 18 meters to avoid any natural impact of industrial buildings such as trees or high buildings, which may affect the data of weather variables. This station was installed in 2007 and is considered one of the first stations in Iraq to measure and collection of weather variables, including temperature, humidity, rain, speed and direction of wind, atmospheric pressure, solar radiation and other variables. The use of rainfall data measured at the station for a period of one season from 2015-12 to 2016-3 the wazirya area of Baghdad.

RESULS AND DISCUSSION

Carbon dioxide is a rare atmospheric gas, accounting for 0.04% of the atmosphere, according to NOAA measurements on the island of Monalo, Hawaii [6]. The concentration of this gas varies according to different factors, including areas close to the surface of the earth and remote areas, the city and the countryside, as well as the industrial cities for non-industrial as it varies by month, In the northern hemisphere the concentration of gas is highest in spring and less in the autumn [7]. Thus, its concentration varies with time and place. Co_2 affected by the high population density and the rate of increase as the population in the region, for example, found that the rate in the New Baghdad area higher than the rate in the Mansour area [5], Percentage of change with time as increasing at night and less during the day Because effect of the plant where the process of photosynthesis at night, the proportion of gas in the atmosphere increases. In addition to the above mentioned, CO_2 gas is also

affected by different weather factors of temperature, rain, etc. In this study we will show the effect of rain on the percentage of the presence of this gas in the atmosphere, through measurements of the percentage of the existence of this gas using the device described above for severe rain cases And medium intensity and weak, and these assignments can be divided by the amount of rain as follows:

Light (0.3mm-3.9mm)

Medium (4mm-10.9mm)

Heavy (11mm-20.9mm)

Very heavy higher than 21mm.

Using equations (1-5) the following results were obtained that will be explained in the tables below. Rain intensity depends on the amount of rainfall and the number of hours of rain, the highest intensity was on 30/12/2016 as table 1, while the highest amount rain was on 22/2/2016 and 27/3/2016, but different rain falling period In the first case, it was approximately 6 hours and in the last two cases (9-12) hours (which was caused by the sinking of most of the residential areas of Baghdad). These cases are classified as heavy rain, so the wash rate of CO_2 is greater than the other cases as tables 2,Figure 1. Where the proportion of gas remaining in the atmosphere after the rain is very little compared to what exists before the rain and so there is positive relationship between them, where the greater the intensity of the rain increased the rates of washing carbon dioxide in the atmosphere as figure 2, i.e proportion of this gas in the atmosphere is decrease, The Correlation coefficient between them (strong correlation, r^2=0.811) and this enhances the above. In the case of light rain recorded in the days 14/12/2015, 6/2 / 2016,14 / 3/2016 as table 2, show The proportion of gas remaining in the atmosphere after the rain is greater than the state of heavy rain. when the amount of rain is equal, the carbon dioxide gas ratios vary depending on the concentration of the gas before the rain, and this is what happened 31\12, 1\1 where I equal, but the gas ratios varied according to the initial concentration and the time also affects the proportions of gas On 31 / 12/2016 rain occurs at night and 1/1/2016 rain occurs during the day, as shown in table 2. the density of flux F(the ratio of the dissolved gas concentration in the amount of rain) has been shown that the intensity increases with intensity rain as the flux density varies depending on the intensity I, When are The intensity of light rain is F = 131 , when I is severe, F = 1374 and when I medium F = 735, so there is a positive relation between them as shown in Figure 3.

Measurements were shown for concentrations of carbon dioxide for the city of Baghdad, the high rates of this gas significantly despite the multiplicity of causes that lead to increase in the atmosphere and its impact on the environment on the one hand and human on the other, The concentration of this gas begins to decline at the end of the winter, where the presence of this gas at the beginning of the season is equal to 435ppm at the end of the season is about 350ppm as shown in Figure 1. In figure 4 the amount of gas out washing or so-called (washout), this ratio increases with increased rain intensity, the greater the intensity of heavy rain was a large washout ratio and thus reduce the concentration of carbon dioxide in the atmosphere . at the end of rain period the concentration of gas Washout less than The measured concentration (initial). This shows that the increase of concentrations of carbon dioxide to the city of Baghdad in a large amount, the more rainy winter in Baghdad helps to reduce the concentration of carbon dioxide in the atmosphere.

Table 1. The rainfall intensity I is shown in unit mm / hr and the outside washing coefficient a

The series of cases of rain	Data of rain	Number of hours of rain	The amount of rain unit mm	Rain intensity mm / hr	10×a
1	14/12/2015	2	1.27 (light)	0.635	0.786
2	24/12/2015	3	4.32 (medium)	1.44	1.2
3	30/12/2015	6	16.76 (Heavy)	2.795	1.7

Cont... **Table 1. The rainfall intensity I is shown in unit mm / hr and the outside washing coefficient a**

4	31/12/2015	5	1.25 (Light)	0.25	0.4
5	1/1/2016	3	0.75 (Light)	0.25	0.4
6	22/1/2016	3	1.26 (Light)	0.42	0.63
7	23/1/2016	6	10.66 (Medium)	1.77	1.35
8	6/2/2016	2	2.03 (Light)	1.01	1.005
9	7/2/2016	2	3.29 (Light)	1.645	1.3
10	11/2/2016	2	0.75 (Light)	0.375	0.594
11	22/2/2016	12	22.79 (very heavy)	1.899	1.404
12	23/2/2016	7	6.78 (medium)	0.966	0.982
13	14/3/2016	1	1.27 (light)	1.27	1.13
14	27/3/2016	9	22.73 (very heavy)	2.5	1.633

Table 2. Shows the concentration of carbon dioxide before and after the rain and the intensity of the flow F.

Sequence	Data of rain	initial concentration of gas co2 before one hour of rain unit PPM	Outside concentration of washing after rain stops with PPM unit	Density flux (F)
1	14/12/2015	435	188	131.3
2	24/12/2015	463	337	656
3	30/12/2015	460	448	1374
4	31/12/2015	435	252	69.3
5	1/1/2016	380	154	42.35
6	22/1/2016	440	141	65
7	23/1/2016	400	378	735.9
8	6/2/2016	360	185	491
9	7/2/2016	360	218	394
10	11/2/2016	340	118	48.6
11	22/2/2016	320	319	636
12	23/2/2016	350	320	341
13	14/3/2016	310	206	290
14	27/3/2016	305	368	1012

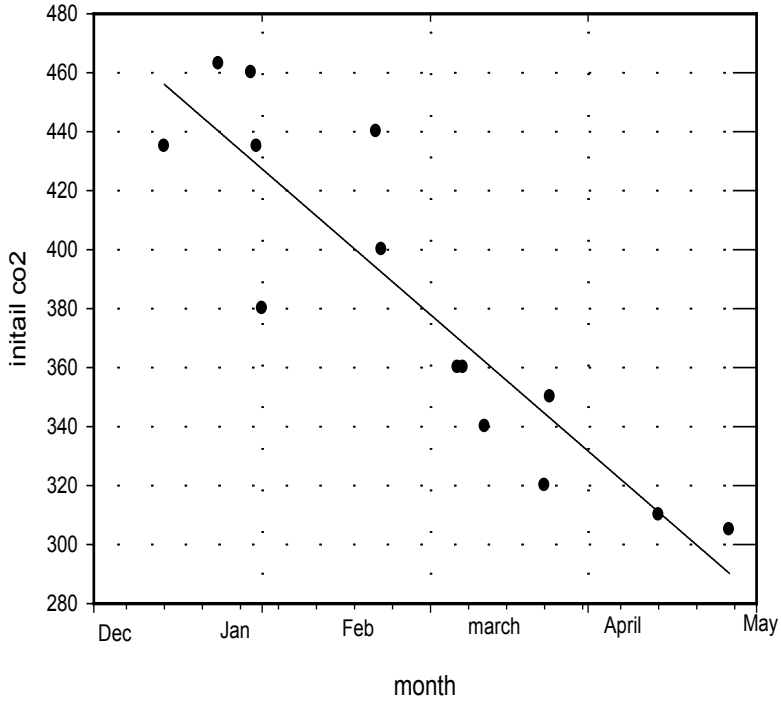

Figure 1. Concentration of co_2 through study period

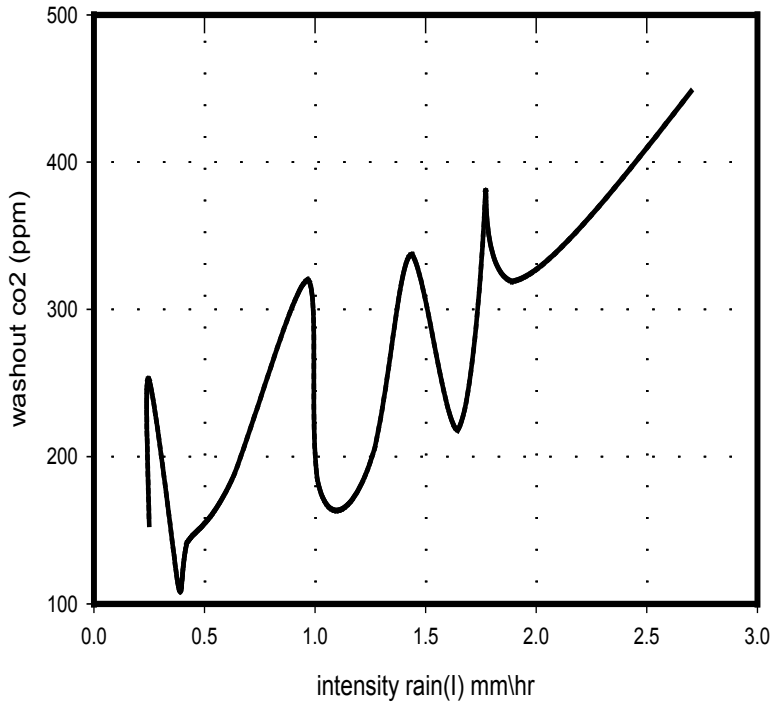

Figure 2. Relation between washout co2 and intensity rain.

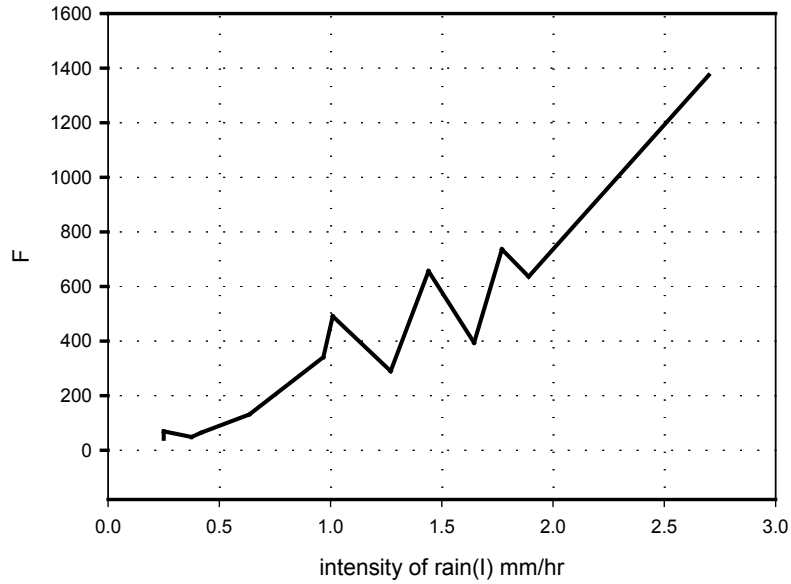

Figure 3. Relation between F and I.

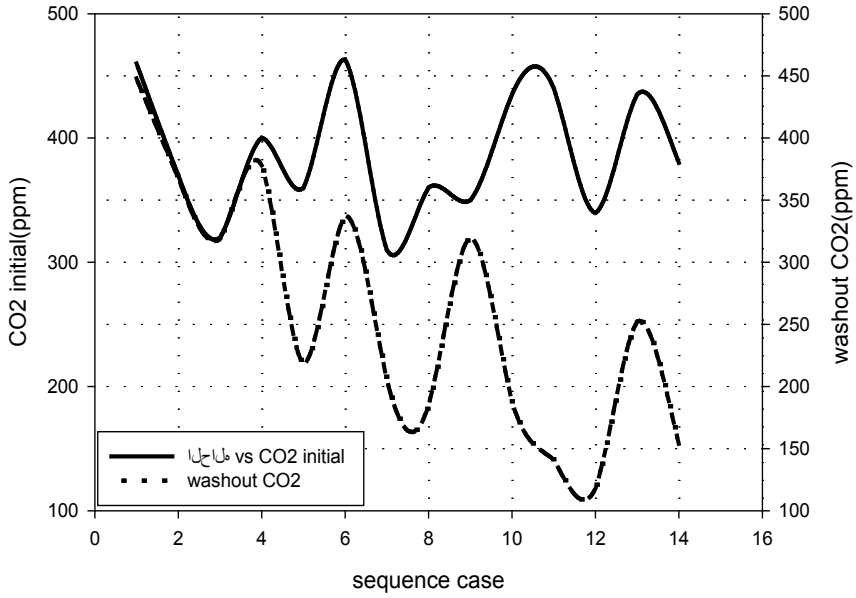

Figure 4. Concentration of co2 initial and washout co2 through study

CONCLUSION

Concentration of CO_2 decreases at the end of the winter season as the measurements show that the concentration of gas at the beginning of the season is about 450ppm and at the end of the season 350ppm. The percentage of gas out washing (washout) increases with increasing rain intensity, the greater the amount of rain, the lower the proportion of the presence of carbon dioxide. The flux density of dissolved gas in the rain increases with increasing rain intensity, where when I = 0.25mm, F = 69 and when I = 2.7mm, F = 101.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Atmospheric Sciences Department,

Collage of Sciences, AL-Mustansiriyah University, Iraq and all experiments were carried out in accordance with approved guidelines.

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Histopathological Study of Infection with Helminthic Parasites Intestinal of some Tigris River Fish passing Through Tikrit City, Iraq

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ABSTRACT

A total of 100 fish samples were collected from Tigris river at Tikrit city, during the period from September 2017 to March 2018. These fishes were belonging to ten species which were *Alburnus sellal, Arabibarbus grypus,Carasobarbus luteus, Coptodon zillii, Cyprinus carpio, Cyprinus kais, Leuciscus vorax, Luciobarbus Xanthopteru, Mystus pelusius* and *Silurus triostegus*. The results revealed infection with four species of worms including three cestoda *Eubotherium salvelini, Schyzocotyle acheiognathi* in *cyprinus carpio* with percentage of infection(5.2, 10)% respectively and *Ligula intestinalis* in *Coptodon zillii* with percentage of infection (9)%. *One specie* acanthocephala *(Neoechinorhynchus zabensis)* in *Arabibarbus grypus* and *Carasobarbus luteus* with percentage of infection(20, 5.8)% respectively. In this study also recorded two new hosts including *Eubotherium salvelini* and *Ligula intestinalis* were recorded the first in Iraq. The present study included the histopathological changes on the intestine which infected with parasitic worms (acanthocephalan, cestoda). It has been differentiated the intestinal villi appeared with epithelial degeneration and cellular debris in the luman of intestinal, also the basement membrane of this epithelium was displaced from the core of villus, cavitation in muscular layer, complete sloughing of epithelium in intestinal cavity and white blood cells infiltration especially in lymphocyte cells.

Keywords: *Tiger fish, Worms, histopathology, cestoda.*

INTRODUCTION

Fish are infected with a wide spectrum of parasites, some of them are pathogenic for other kinds of fish or the vertebrates such carnivorous including the human being [1]. It became important to study the causes and life cycles to be diagnosed and finding the way to control it [2]. Some parasites cause a mechanic damages for the fish when they move throughout their tissues, and they cause over growth in the connecting tissues that obstacles the processes of reproduction and growth .Some of fish parasites or their larvic stages transfer in to the human being by eating fish uncooked or bad cooked such as nematode worm *Gnathostoma* , liver worm *Clonorichis sinesis* and cestoda worm *Diphyllobothrium latum* [3]. Because of few studies in the country that deal with tissue changes resulted from intestinal infections by parasitic worms in Tigris river fish, so this study aims at isolating parasitic worms and studying the tissue pathogenic changes of intestinal tissue infected by parasites.

MATERIALS AND METHOD

A total of 100 fish specimen were collected during the period from September 2017 to March 2018 from different local shops in Tikrit City. Samples transferred to our parasite laboratory in College of Science according mentioned method to [4] the method is that splitting linear at media ventral line from head to anus then opened from first splitting to cover gills on length line side of fish. After that this piece was removed to appear internal parts to examine the body cavity by eyes in order to notice worms. The gastrointestinal tract was dissected out from the rectum to the esophagus , opened longitudinally and examined carefully. worms have been preserved in 70% alchol , they were stained with following method to [5], dehydrated in an ethanol series (70%, 80%, 90%, 100%) , cleared in Xylene mounted with Canada balsam. As tissue sections were fixed in

10% neutral formalin , prepared them were passed by Histokinate then embedding of paraffin, were cut thickness five microns , stained with hematoxylin and eosion (H&E) and examined under microscope [6,7].

RESULTS AND DISCUSSION

Through the current study is collected and examined 100 fish, involved ten species of fish. They have taken from Tigris river at Tikrit city. The results revealed that infection with four specises of worms involving three cestoda *Eubotherium salvelini, Schyzocotyle acheiognathi* in *cyprinus carpio* with percentage of infe*ction* (5.2, 10)% respectively and *Ligula intestianalis* in *coptodon zillii* with percentage of infection (9)%. *One specie* acanthocephala *(Neoechinorhynchus zabensis)* in *Arabibarbus grypus* and *Carasobarbus luteus* with percentage of infection(20, 5.8)% respectively as shown in table (1). This study also includes the effects pathogenic tissue are caused by parasite worms as following:

cestoda: *Eubotherium salvelini*

Differentiated tissue sections to intestinal in Cyprinus carpio that the intestinal villi were containing great vacuoles in between epithelial cell which were also appeared mostly degenerated with presence sloughed cells in the lumen of intestinal (fig. 1).

Schyzocotyle acheiognathi

Pathogenic tissue changes to intestinal in *Cyprinus carpio* show that the lamina propria and sub mucosa was infiltrated with lymphocytes and other white blood cells , also these cells are aggregated in the form of local patter around the suspected parasites and empty blood vessel (fig. 2). It also displays the intestinal mucosa was formed low great villi, but its epithelium which are lining appeared completely sloughed from the surface which appeared like the core of villi with different regions infiltrated by white blood cells (fig. 3).

Acanthocephala: *Neoechinorhychus* zabensis

It indicates through examined tissue sections to intestinal in Arabibarbus grypus there are certain areas in the epithelium was lost its continuation with others, also other areas were lost its epithelium completely and these areas were invaded by white blood cell and lymphocytic aggregation, the blood vessels in the lamina propria had thick wall with great number of white blood cell and red blood cell in its lumen (fig. 4). Distinguished tissue sections in *Carasobabus luteus* that the intestinal villi appeared with epithelial degeneration and cellular debris in the lumen of intestine , also the basement membrane of this epithelium was displaced from the core of villus. Which this core was greatly infiltrated with lymphocytic and other white blood cell aggregation (figu.5). The current study is recorded that pathogenic tissue changes resulted from infection with intestinal worms included:

1. **Cestoda** : ***Eubotherium salvelini***

The current study indicates that damages are caused by this worm in *Cprinus carpio* , degenerated epithelium of intestinal villi and appeared vacuoles , sloughing cells in sub mucosa layer. perhaps, it has been caused these damages to be secreted by worm that toxin effects on tissue cause defect in organisms function [8]. Generally, damages are mechanical in the area of connecting worm, it has been obtained cause of inflammation peritonitis or causes of internal hemorrhage [9,10].

Schyzocotyle acheiognathi

This study shows that mechanical damages of intestinal *Cprinus carpio* caused by parasitic worms . it also results from parasitic infiltration of intestinal layers especially mucoid and submucoid layer of inflammatory cells of lymphocytes types. this infiltration is represented as reaction of parasitic process [11]. principally, inflammatory cells focus were got in the never layers of parasitic worms when it tried to stick intestine walls by use bothria. According to the size of worm , it may be led to the pressure is resulted from sticking worm intestine walls to lose far of intestine. In view of bigness worm perhaps leads the resulted pressure to stick worm of intestinal wall to lose from epethial layer . this agreed with [12] .

Acanthocephala : *N.* zabensis in *Arabibarbus grypus*

This study displays that pathogenic intestinal changes to fishes are infected by parasite , there closed in cavity intestinal of parasite section are caused damaging epithelial desqumation strongly with reducting villus because of being fixed probosis parasite in epithelial layer and makes irritation , parasite makes acute response inflammatory locally because the presence of worms parasite , these finding are agreed with [12,13].

Most of pathogenic effects of acanthocephalus resulted from sticking adult worm and larves in tissue , however , pathogenic effects of infection are resulted from sticking adult worm deep areas in tissue devastation has been arrived at more deeper than sticking areas proboscis parasite, parasite usually tends to stick of epthela layer and perhaps extend sticking to muscular layer of intestinal [13,16].

N. zabensis in Carasobabus luteus

the current study shows that worm cause damage variously in intestinal of *Carasobabus luteus* infected , appears that tissue sections degeneration epithal , absement membrane and core of villus greatly infiltrated with lymphocytic and other white blood cell aggregation, is represented as reaction of host towards sticking worm. It has been known that acanthocephalus penetrate some or all wall layers of intestinal fish infected especially if it was long proboscis parasite [17]. These damages causes to close cavity intestinal especially when these worms in the bigger size and lot of numbers, this agreed with [18].

Table 1. Recorded worms species in fish, Prevalence and Average of violence infection

Worms species	Hosts	Number of fishes		Number of isolated worms	Prevalence (%)	Mean intensity of infection
		Examined	Infected			
Eubotherium salvelini	Cyprinus* carpio	21	1	2	5.2	2
Schyzocotyle acheilognathi	Cprinus carpio	21	2	6	10	3
Ligula intestinelis	Coptodon* zillii	11	1	5	9	5
Neoechinorhynchus zabensis	Arabibarbus grypus	5	1	1	20	1
	Carasobabus luteus	17	1	3	5.8	3

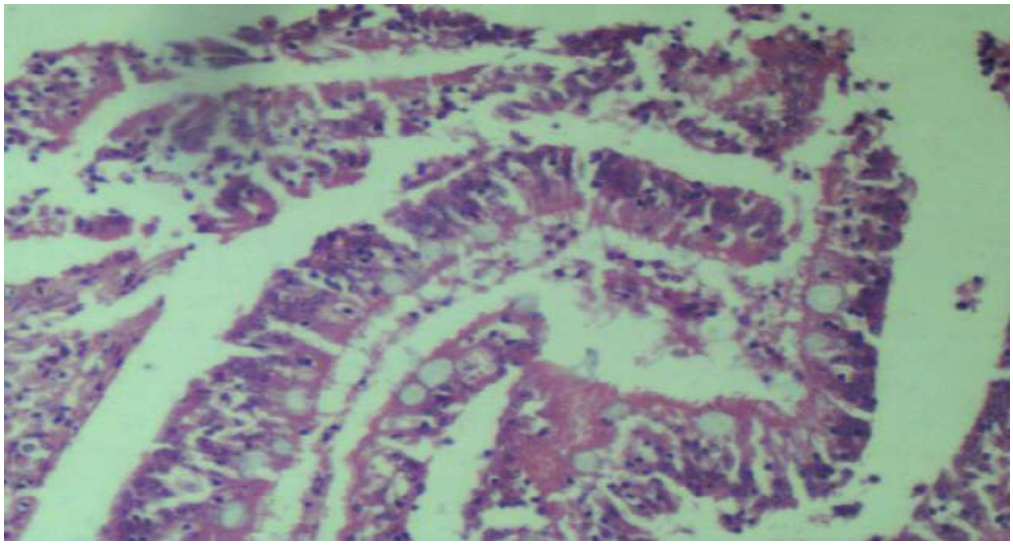

Figure 1. Tissue sections to intestinal in *Cyprinus carpio* infected *Eubotherium salvelini* explain degenerated epithelium of the intestinal villi , vacuoles in the epithelium (H&E X40)

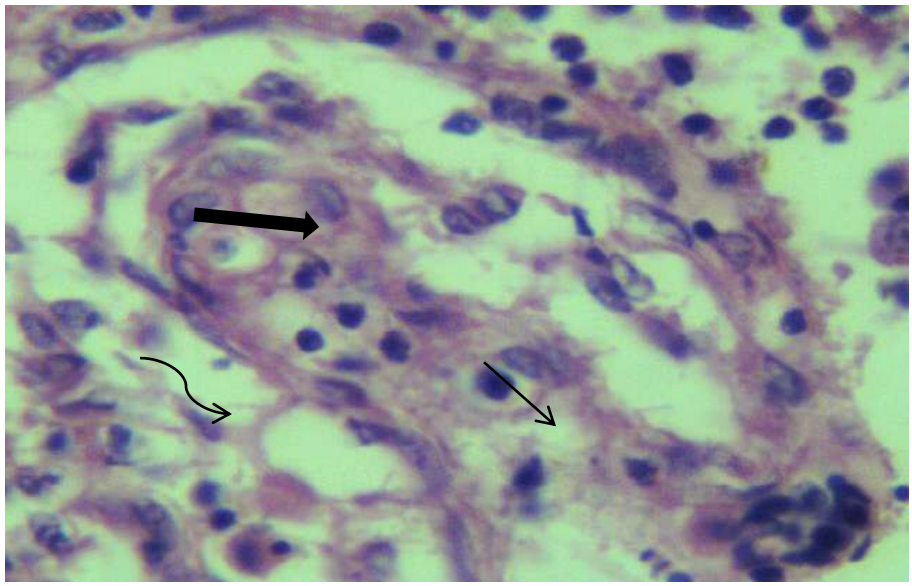

Figure 2. Tissue sections to intestinal in *Cyprinus carpio* infected *Schyzocotyle acheiognathi* explain lymphocytic diffusion (➡) in the lamina propria and sub mucosa (⟶) , suspected parasite (⤳) (H&E X40)

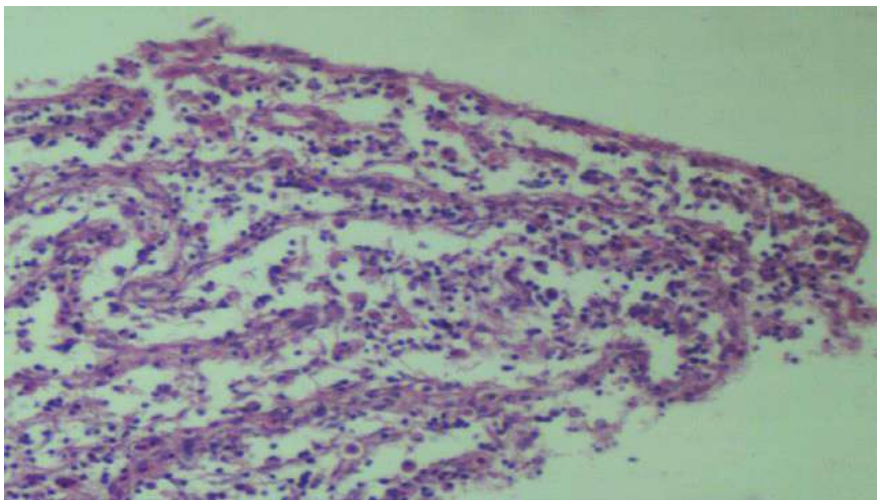

Figure 3.: Tissue sections to intestinal in *Cyprinus carpio* infected *Schyzocotyle acheiognathi* explain complete sloughing of epithelium (➡) , core of villus with lymphocytes (⟶) (H&E X40)

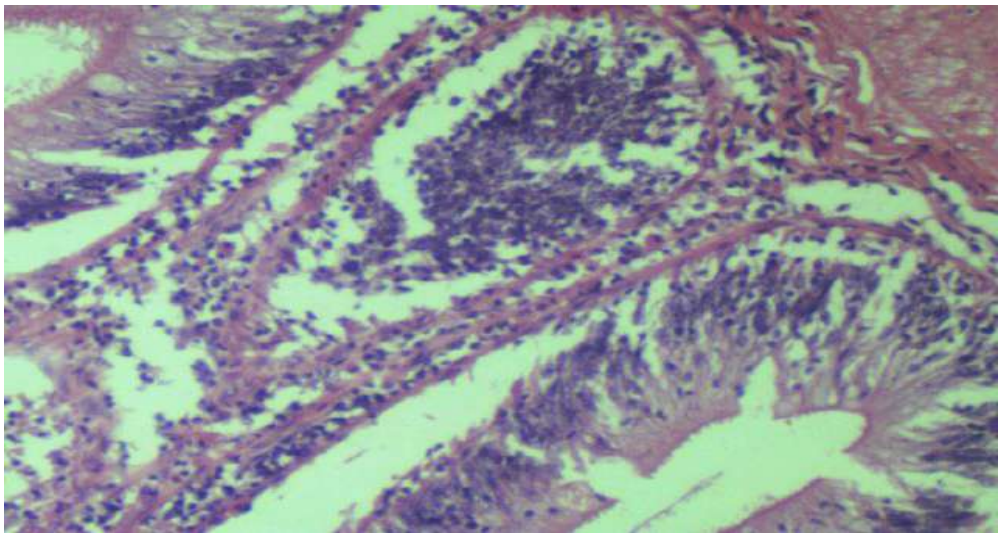

Figure 4. Tissue section to intestinal in *Arabibarbus grypus* infected *Neoechinorhychus zabensis* explain discontiuvation of epithelium (➡), with invasion the epithelium by lymphocytes (⟶),lymphocytic aggregation in lamina propria(⤳) (H&E X40).

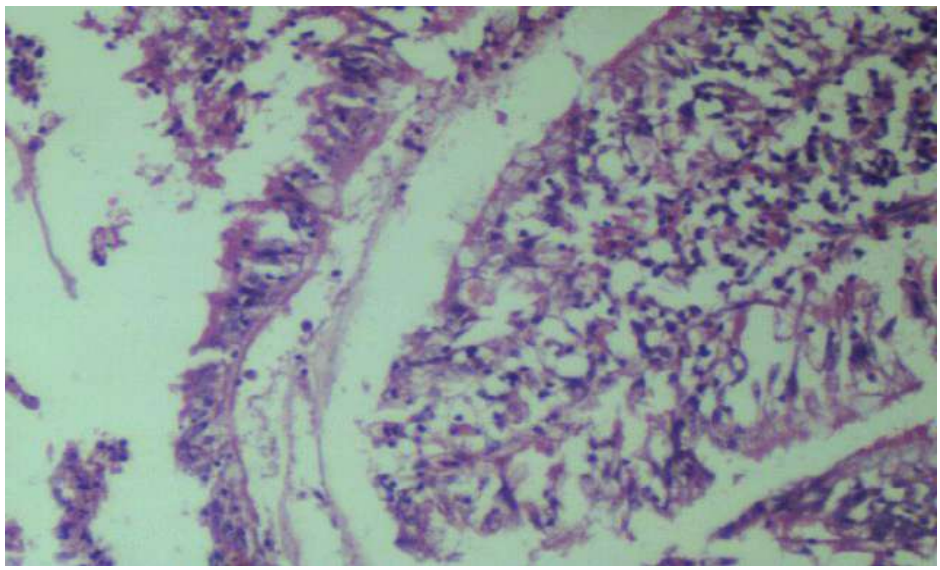

Figure 5. Tissue section to intestinal in *Carasobabus luteus* infected *Neoechinorhychus zabensis* explain epithelial degeneration (⟶) , basement memberen (➡) , core of villus (⤳) .

CONCLUSION

The present study included the histopathological changes on the intestine which infected with parasitic worms (acanthocephalan, cestoda). It has been differentiated the intestinal villi appeared with epithelial degeneration and cellular debris in the luman of intestinal, also the basement membrane of this epithelium was displaced from the core of villus, cavitation in muscular layer, complete sloughing of epithelium in intestinal cavity and white blood cells infiltration especially in lymphocyte cells.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Science, University of Tikrit, Iraq and all experiments were carried out in accordance with approved guidelines.

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Leukemia Detection Using Image Processing

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ABSTRACT

Digital image processing for medical images has advanced so much in a very short period of time, but we still have to figure out very narrow issues which can be very important sometimes. One such problem is to successfully differentiate between a normal bone marrow slides images with an abnormal one. This needs to be done with high accuracy because these classification results will be going for classification of different types of Leukemia. In order to work through the process, a number of features will be extracted from each image. A set of images will be used to get the features and another set will be used to test out the features extracted from the training dataset. This classification technique is done at a high accuracy rate to identify a malicious Leukemia image.

Keywords: *Leukemia, image processing*

INTRODUCTION

From multiple types of cancers, Leukemia is one type of blood cancer. As per [1], about 4.5% cases of cancer in Malaysia are for Leukemia. This type of cancer starts in bone marrow. The mains cause of Leukemia is extra formation of malignant white blood cells (WBCs) which are also immature in nature [2]. Unfortunately, children are more likely to have Leukemia as compared to adults. There are four types of this cancer:

- AML - Acute Myelogenous Leukemia
- ALL - Acute Lymphocytic Leukemia
- CML - Chronic Myelogenous Leukemia
- CLL - Chronic Lymphocytic Leukemia

Types of WBCs which can be affected by Leukemia are neutrophils, basophils, along with eosinophils, monocytes and lymphocytes. The progression speed of acute Leukemia (AML and ALL) is more than chronic Leukemia (CML and CLL). If caught at early stages of the disease, Leukemia is very much curable and treatable. A hematologist recommends a complete blood count (CBC) test to check for the disease. A detailed study of morphological marrow of bone smear analysis needs to be conducted if there are found any form of abnormal counts of the cell from the test. This is finalized to ensure the presence and detection of leukemic cells in the blood [3]. There are instances where the counts of platelets and RBCs becomes very low in leukemia. Based on the current scenario in medical industry, the presence of leukemia is observed by taking a look at the nucleus and the cytoplasm via a microscope [4]. The only problem is that this task of looking under the microscope is a very tedious task to accomplish, and that goes even for an expert too. Because of this process's extensive nature of diagnose, the final results might lead to misdiagnosis.

Classification of leukemia is a long and complicated process with multiple steps. The first step is to separate the images of bone marrow into normal and abnormal category. Again, this classification is also a multistep process. These processes are as follows:

- Image enhancement
- Image segmentation
- Features extraction
- Classification

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In medical imagery, the first step which is image enhancement plays a very important and crucial role. Reason being this step improves and enhances the quality of the image and it becomes easy and efficient for human viewing. But medical images comes with their own issues and weaknesses. This issue is missing contrast from the image which is due to the bad lighting at the time of image acquisition. Hence, image enhancement steps are taken so that this problem can be overcome with. The steps which leads into image analysis and image interpretation is none other than image segmentation, in this step the medical image is separated into regions [5]. The tasks which follows this one, such as feature extraction and image classification relies heavily on the quality and efficiency of image segmentation [6]. In Leukemia, WBCs holds very important information about the diagnosis of leukemia. Hence, during the segmentation process the RBCs and background will be segmented and we are left with the WBC only which will go further into the analysis. The next step is to extract the features out of the image having only WBCs. These are the features holding vital information about the classification and diagnosis. A hematologist observes the WBCs from the image on various parameters [7]:

- Size
- Shape
- Nucleus chromatin structure and its characteristics
- Nucleoli's size and color
- Cytoplasm's color
- Characteristics of granules and their presence/ absence

These are some of the features which are extracted in order to classify efficiently. Color based features are extracted in this paper, which are as follows:

- Standard deviation
- Mean
- Variance

These features are extracted for red, blue and green channel separately. These features and then used to classify the faulty and non-faulty leukemic cells. We can categorize the whole implementation is broadly divided into two parts:

This would be our base dataset, which we will use to create a baseline for comparison with other images.

We then need to process the other half of raw data i.e. we process the remaining images to as to make a decision for test images. This decision will be in regards to whether the test images belong to cancerous or non-cancerous category.

The whole project will be divided into 2 parts. Part 1 involves extracting features from a set of sample images, part 2 is about comparing the extracted features with images to mark them as cancerous or not. We have employed 35 distinct sample images to create a baseline data as well as comparison with the test images. This data size can obviously be increased or decreased as per the user's requirements. But as per the author's guidelines, the bigger the training dataset images, the better. More number of input images will yield better baseline and hence better results to compare with. Once the extraction process is complete, we define the optimal range for each feature. This range for every feature will be used in the next step in order to classify the images into cancerous and non-cancerous category. Part 2 takes a test image as input and extracted feature range from part 1 as well is taken as input. Features are extracted for the test image. These new features will be compared with the feature database and baseline. This is how the new image is classifies into cancerous and non-cancerous categories.

METHODOLOGY

In the given paper, the author has used the following methodology for the implementation of a generic system to classify leukemic cells in the blood samples. The process is automated so that manual interventions like looking under a microscope could be dealt with and an efficient result could be obtained. Because a mis-diagnosis in this case could be a heavy mistake from the medical perspective.

- Input all the images (cancerous only) into the system
- Extract the following parameters from these images, one by one
    - o Mean value of red channel pixels
    - o Mean value of blue channel pixels

- Mean value of green channel pixels
- Standard deviation of red channel pixels
- Standard deviation of blue channel pixels
- Standard deviation of green channel pixels
- Variance of red channel pixels
- Variance of clue channel pixels
- Variance of green channel pixels

- In this code, we are using a total of 35 images (we can increase this number by including more images)
- Hence, we will get a total of 35 sets of parameters for all the cancerous images
- After getting all the values, we will decide a range for maximas and minimas for all the parameters used.
- After this, we will have a range for each parameter.
- To test an image, again calculate all the above parameters for that test image
- Now, if any of the parameter of test image comes under the range of our dataset, the image comes closer to be a cancerous image
- But, if even 1 of the parameter is out of range, then test image is declared not cancerous.
- To test, a set of random images is also given.

RESULTS AND DISCUSSION

Following are the images which passes the test and are termed as healthy cells based on the classification criteria.

Based on the above experiment, it is evident to say that the implementation based on feature extraction specifically on the color features of these images works really well and efficiently.

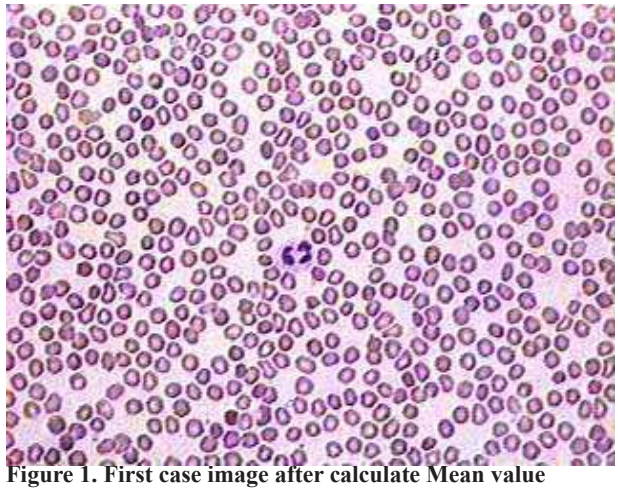

Figure 1. First case image after calculate Mean value

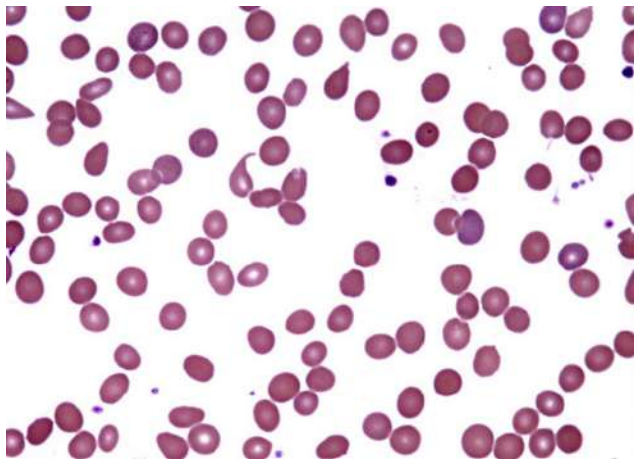

Figure 2. First case image after calculate Standard deviation value

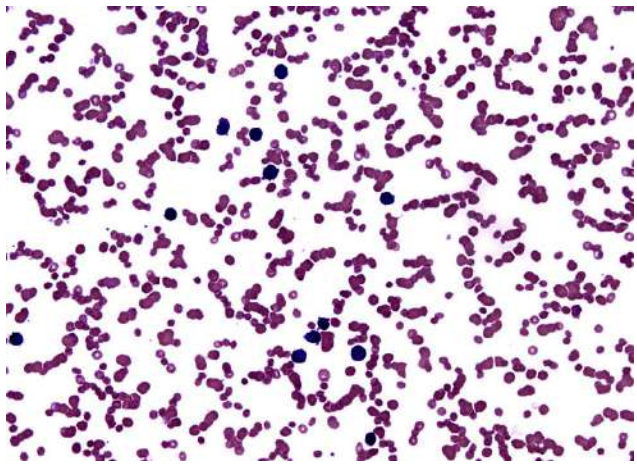

Figure 3. First case image after calculate Variance value

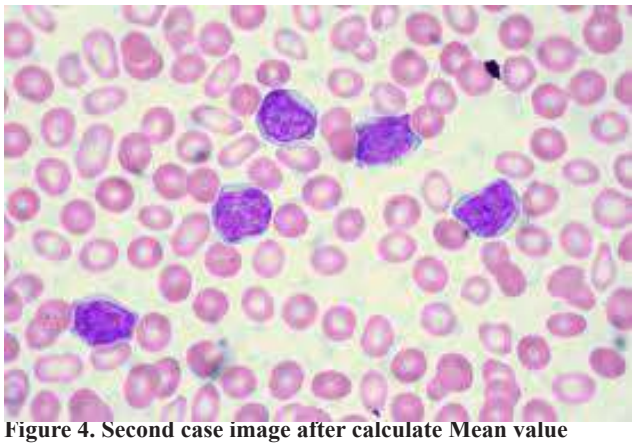

Figure 4. Second case image after calculate Mean value

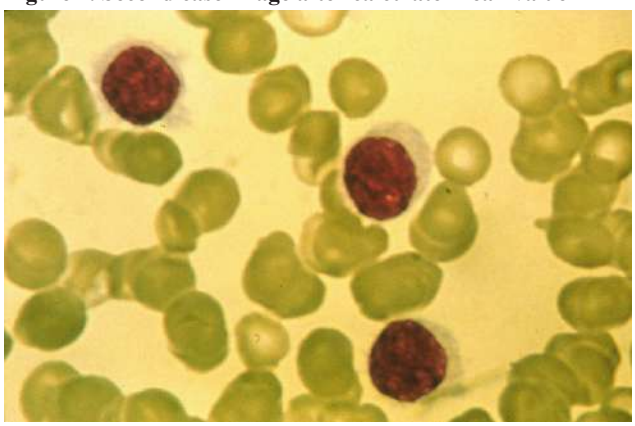

Figure 5. Second case image after calculate Standard deviation value

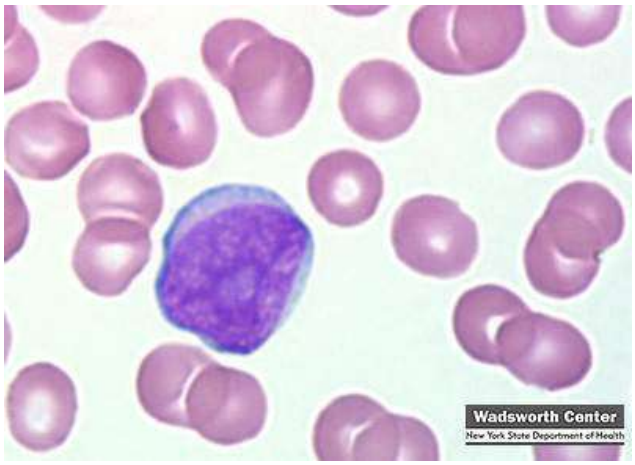

Figure 6. Second case image after calculate Variance value

CONCLUSION

This paper study involves classification of leukemic affected cells from the general lot of healthy cells. This is done using the microscopic blood sample images. The proposed system uses the microscopic images and extract the features in terms of standard deviation, mean and variance of red, green and blue channel of the microscopic blood sample images. The algorithm used in the above discussion is able to identify the infected cells in RBCs when used for an infected individual. The system showed efficiency, reliability, was able to perform calculations in a considerable less amount of time and with much less error, high accuracy, cheaper computation cost and a robustness in finding the exact solution. This way, it'll become easier to identify the diseased patient.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance

All experimental protocols were approved under the College of education for pure science, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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Relation Level between Physics Nature and Science Teaching Methods for Preparatory Grade Physics Teachers

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ABSTRACT

this research aims to identify the relation level between understanding nature of physics and science teaching methods**,** the descriptive approach has been used to verify the two research tools and testing first tool which is the nature of physics by its aspects (aims, nature, ethics and the interaction between physics and technology) in addition to choosing science teaching methods. The results indicate that there is a poor relation between nature of physics and science teaching methods; many recommendations have been reached in this matter.

Keywords: *testing nature of physics, testing science teaching methods.*

INTRODUCTION

Physics plays an important role in most scientific and practical fields as well as it is regarded as one of the main domains in technical development and other theoretical sciences such as: chemistry, biology, mathematics and applicative sciences such as: medicine, engineering and agriculture [1]. We can say that it covers a large field since it studies the phenomena of the universe and the particles of the material, through this importance comes the importance of paying attention to it and its methods of teaching.

Teaching the nature of a science is considered a massive challenge in the field of science teaching and this matter calls for developing teachers teaching guides which depend on educational science curriculums standards that contribute in the method of learning the nature of science in a manner that positively reflects on the teachers educational practices and their students' performance to deeply understand the nature of that science, scientific knowledge and educational contemplating, therefore, this research is considered one of the supplemental researches as it links between theoretical and applicative aspects in the fields of science philosophy and teaching methods. A lot of new trends emerged in teaching science and physics depending on modern teaching methods that show the relation between science and technology since it forms a proper introduction to science teaching through transforming the theoretical fact of aspects into practical fact in a manner that facilitates the student's improvement of scientific output since these methods are the result of steps and stages followed by the teacher to achieve certain goals as well as modern and various teaching methods. The following studies tackle the nature of science: [1] study about the extent of Oman teachers' understanding of science nature in the light of (gender, experience) variables, [2] study on (the effectiveness of negotiation approach on science nature development), the study of [3] on the opinions physics, chemistry and astronomy teachers about science nature, [5] study on the (aspects of analysis of science nature in science curriculums in Portugal's intermediate schools) and [4] study on investigating teaching committees opinions at the colleges of educational sciences - Jordanian universities about the scientific knowledge and its impact on the educational behavior and beliefs of students. Also the following studies discuss teaching methods and their skills: [6] study on (the actual situation of teaching methods used at the College of Education – Oman and the reason behind their usage) since this study aims to identify the utilized methods (lecturing & discussion and asking questions along with lecturing), [7] study on (*physics teacher* beliefs about *physics* and learning *physics*), [8]

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study on (assessing the performance of natural sciences in the intermediate stage in the light of general standards of general education) and [9] study on (*Jordanian physics teacher* beliefs about teaching strategies and assessment included in science curriculums).

METHODOLOGY

The researcher followed the descriptive method since it is the proper one for the aim of the research which can be summed up in identifying the relation level between the understanding nature of physics and science teaching methods for preparatory grades physics teachers. The research sample includes (140 physics teachers of both genders) of preparatory stages; sample method has been used for the random layer which represents a proportion of (32%) of research population. Preparing this research requires the preparation of the two research tools that must include standards by which the relation level between physics and science teaching methods is identified and therefore, the researcher has followed the following steps to develop these tools: reviewing previous studies and seeking the views of experts and specialists in the fields of psychology and science teaching methods; in the light of these steps, the two research tools have been developed and the first tool which is the nature of physics by the aspects of (aims, characteristics, processes, ethics and the interaction between physics and technology) has been tested. First tool test is a multiple choice question that consists of (20) items and testing teaching methods in the fields of scientific knowledge levels, teaching methods and assessment is also a multiple choice question that consists of (20) items. The statistical means used in the research are percentage, arithmetic average, Pearson correlation coefficient and (T-test) for one sample and two independent samples.

RESULTS AND DISCUSSION

The results show that applying physics nature test on teachers sample indicates that the arithmetic average has reached (18.87) which is equal to (60.04%); percentage method has been adopted in order to explain the results since (80%) represents very high understanding level, (79.70%) represents high understanding level, (69.60%) represents medium understanding level and less than (60%) represents low understanding level. We notice from table (4) that percentage of choices for three aspects is (60.04%) and this percentage indicates a medium level of understanding of physics nature; this result complies with (Hussam Al-Deen & Schwartz, 2008) research results. The results in table (5) have been reached by using (T-test) method in testing physics nature understanding according to (gender) variable. We notice from table (5) that the calculated significance level reached (0.79%) which is more than significance level amounting to (0.5%) that conforms with null hypothesis which provides that there are no differences in understanding physics nature according to gender variable and this can be attributed to the mutual interest in searching for different references whether within the specialty, modern or classic. Arithmetic averages and standard deviations for teachers according to (years of experience variable) have been calculated as in table (6). We notice from table (6) that teachers with experience years less than (5) have an arithmetic average of (38.73) and a standard deviation of (7.03), teachers with experience 5-10 years have an arithmetic average of (34.8) and a standard deviation of (9.89); teachers with more than 10 years of experience have an arithmetic average of (37.76) and a standard deviation of (7.78). Table (7) shows the results of teaching methods test which has been applied on the same sample of teachers. We notice from table (7) that the total arithmetic average is (9.223) which is equal to (28.197%) and this does not rise to the educational acceptance level of (60%). Table (8) shows the results of teaching methods test which has been applied on physics teachers according to years of experience variable. Arithmetic averages and standard deviations for physics teachers' grades in teaching methods test according to teaching experience have been extracted as teachers with less than 5 years of experience have an arithmetic average of (28.66), teachers with 5-10 years of experience have an arithmetic average of (28.76) and teachers with more than 10 years of experience have an arithmetic average of (28.12). As for the range of relation between physics nature test and methods of teaching test, teachers' answers on both tests show that correlation coefficient between the tests' grades has reached (0.38) which is considered to be poor and indicates a poor correlation. In the light of the results presented by the researcher, she reached the following conclusions: the necessity to assess physics books in order to check on the inclusion of the physics nature fields since they have an impact on teachers' educational practices through using teaching methods, certain questions patterns and students education assessment in manner that achieves scientific progress; the necessity to

activate the role of teachers by training them before and during service through including plans which aim to make them qualified to link between physics and science teaching methods.

Table 1. Shows some of the items for choosing teaching methods

No.	Item	A	B	C
1	A Scientific output that proves its validity in certain times and conditions is considered a:	Scientific fact	Scientific concept	Scientific theory
2	one the reasons that call for using different methods and means in teaching science is:	Increase in number of students	Scientific variety	There are no specific reasons
3	Teacher's movements, students responses and teaching aims of study subject represent:	Teaching method	Teaching style	Teaching strategy
4	Using certain skills to identify problems such as explanation or prediction is called:	Social skill	Motor skill	Scientific thinking
5	The skills that science teaching is trying provide for students are:	Academic personal skills such as thinking and manual skills	Student appreciating the importance of science in his daily life	Discussing scientific topics and their effects

Table 2. Shows preparatory stage physics teachers' understanding level of physics nature

Aspect	Grade	Arithmetic average	Standard deviation	%
Aims and characteristics	12	8.14	1.48	68
Nature and ethics of science	13	6.48	1.44	72
Interaction between technology and physics and the society	18	4.25	1.25	75
Aspects together	37	18.78	4.17	60.04

Table 3. Shows the arithmetic averages and standard deviations of teachers understanding of physics nature test according to years of experience variable

Field	Gender	Number	Arithmetic average	Standard deviation	(T-test)	Significance
Total grade	Males	70	37.77	6.36	0.22	0.79
	Females	70	36.65	6.77		

Table 4. Arithmetic averages and standard deviations for teachers according to (years of experience variable)

Field	Years of experience	Number	Arithmetic average	Standard deviation
Total grade	Less than (5) years	30	38.73	7.03
	5-10 years	36	34.8	9.89
	More than 10 years	74	37.76	7.78

Table 5. Arithmetic averages and standard deviations of teaching methods test for physics teachers according to gender variable

Gender	Members of sample	Arithmetic average	Standard deviation	Percentage of mediums %
Males	70	8.871	2.539	27.722
Females	70	9.107	2.227	2,459
Total	140	9.223	2.362	28.197

Table 6. Arithmetic averages and standard deviations according to teaching experience

Experience	Members of sample	Arithmetic average	Standard deviation	Percentage of mediums %
Less than 5 years	30	9.1	2.310	28.66
5-10 years	36	8.94	2.42	28.76
More than 10 years	74	7.55	2.01	28.12

CONCLUSION

It is clear from the presented results that the percentage of physics nature test has reached (60.40%) which indicates a medium level for physics teachers; the researcher attributed this matter to their lack of employing intellectual fields through different scientific processes in their teaching methods, since it would deviate them from their main teaching task, and focusing only on the curriculum in addition to the reason of failure of developing their trends and beliefs to search for everything new in the different education stages. The results showed that teaching methods test has reached (28.197%) and this percentage does not rise to the acceptance level due to the teachers' unfamiliarity with science teaching methods and their only concern is to complete the curriculum whatever the teaching methods. The results also show that the relation between physics nature test and methods of teaching test is poor according the teachers grades in both tests and this matter refers to the poor correlation between them and the importance of variety in employing teaching methods to understand the nature of physics.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Basic Education, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Effectiveness of a Proposed Teaching Method to Develop the Productive Thinking Skills of Primary School Students in Reading

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ABSTRACT

The study was conducted with the aim of building a proposed teaching method for developing the productive thinking skills of primary school pupils in Iraq. The sample was selected from the center of Babylon Governorate, and the use of the relevant skills, such as percentages and t-test, and the search results in a list of the skills of thinking and the building of the method. The results of the study showed that the proposed educational method has an impact on the development of productive thinking skills among primary school students.

Keywords: *Effectiveness, Instructional Method, Productive Thinking Skills, Reading*

INTRODUCTION

The educational and educational process in Iraq suffers from multiple problems, especially its components, which are represented by students, teachers and curriculum. The curriculum is prepared according to the old educational philosophy which believes in the frequent receiving of the knowledge and the efficient teacher according to this philosophy is able to transfer the great amount of information to the learners. Which guarantees the teacher the abundance of information transmitted to the learners regardless of whether this information is practical or not and does the literacy skills of learners improve and refine their talents? If the teaching methods used by teachers are limited to Providing the learners with knowledge is not enough to prepare the successful learner because the teaching profession has sufficient knowledge and performance[1,2]. If there is a defect in the performance competencies, the teacher cannot achieve the educational goals no matter what his cognitive competencies. This is confirmed by the recent trends in the preparation of teachers, Education is not enough to influence the learner for the purpose of learning, but the teacher to have the necessary skill to perform educational tasks in educational situations to ensure the development of thinking skills of learners, and therefore can be said that what results from the educational effort in the field Education is a natural reaction to the problems experienced by various educational institutions revealed by experience and practice, and that the problems of reading education vary according to the stage of study and that the observed weakness in the achievement of learners for the primary stage may be due to weakness in the performance of teachers at the primary stage. The research problem can be summed up in the following question: Does the proposed educational method have an impact on the development of productive thinking skills among primary school students in reading [3,4]. The question of thinking occupies a major place in the educational sciences, in other sciences and in life in general, because the task of thinking is to find suitable solutions to the urgent theoretical and practical problems faced by man in nature and society. These problems are constantly renewed, which always prompts him to seek new methods and methods to help him find solutions. And thus enables him to overcome difficulties, so thinking - as a cognitive process - is an essential element in the mental construction of knowledge possessed by man, and Hoing believes that creative thinking is a complex

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thinking that involves breaking or reconstructing old or old ideas. The researcher believes that the development of ideas produced by learners depends to a great extent on the teaching methods they receive from teachers, as Philip's study The study aimed to evaluate the content of the teaching programs and teaching methods used in Turin, Italy, and used in this study the personal interviews and the questionnaire restricted in data collection. One of the most important conclusions was that the content of the programs was varied but did not take into account the individual differences, despite its diversity, with the need to involve teachers in the development of programs and propose methods of teaching to create the productive learner, Phillips 1999: 69. Bradley asserts that there is no ideal way to impose on the teacher Affect his idea and innovation but he must be aware of the goals and the nature of learners and the possibilities available as well as his potential as a leader of the educational process is the decision maker [6,7]. The method of teaching consists of most components of the educational process as well as the objectives, content and sources of learning and emphasizes the transfer of ideas, skills and activities to bring about the desired change in the behavior of the learner Fawal, 2005: 258), and the researcher believes that the importance of teaching method comes from how the teacher achieve the objectives of his lesson The method that depends on positive change, and the active teacher who pays his students to the thinking of the product is continuous and can be a reading material to achieve this, Berlson stressed the need for careful reading and accurate text that is intended to analyze the content and this distinguishes it from normal reading, reading includes a thorough understanding of the vocabulary and the extraction of meanings as well as understanding the sentences and identify relationships and knowledge of the rules of language and recognize the links between the paragraphs of the text and awareness of patterns of knowledge and organization and order so that the learner can understand the text accurately Durkin and Dolores, 1995: 122), And the reading in terms of education in the present age an important way to fruitful learning, and an essential component of the educational process is based on it to provide students with information and skills and applied positively, to give that process fruit and achieve its objectives. The objective of the study was to identify the effectiveness of teaching in the Karen model in the achievement and thinking produced by the second grade students in physics. To achieve this goal, the researcher formulated the following hypotheses: "There is no statistically significant difference at the level of (0.05) The experimental group studying physics using the Karen model and the mean scores of control group students who study the same material in the normal way with the post-test "and" there is no statistically significant difference at the level of significance (0.05) between the average grade of the experimental group students who study the The study sample consisted of (54) students who were randomly assigned to the experimental group (27) students and the control group (27) students who were equal In the following variables (age, parental achievement, intelligence, first course grades for physics, previous information, and productive thinking), the researcher prepared two tests, the first of which consists of (40) test paragraphs of the type of multiple choice and the other, Wen (26) position, has been confirmed Alsekoumtrah characteristics of the two tests, and the results of the study showed the superiority of the experimental group students on the control group students in the collection and thinking about the product. Study of the painter: The objective of the study is to identify the impact of a training program based on the dimensions of learning in the development of some of the thinking skills produced by students in Kuwait. The sample of the study (89) students from sixth grade students in Kuwait. Six sub-tests are (interpretation, analysis, evaluation, fluency, flexibility, originality) and the overall score of the test. This confirms the parity of the experimental and control groups before applying the learning program based on learning dimensions. Study of Ramadan: The study aimed to design a training program to develop the motivation of achievement among students of secondary education who are late in school and to discover the effect of training using this proposed program on the development of educational achievement and on the development of creative thinking. (108) students from the first grade of high school in Petra secondary school, and used the measure of achievement motivation and the Tawarenz test of creative thinking verbal (Picture A) and the Tournes test of innovative thinking using images (Picture B) Naya Critical Thinking 2000 and a training program for the development of motivation achievement. The results showed that there were statistically significant differences between the average scores of the experimental group and the control group in the post-measurement of the variable achievement of the first semester marks (creative thinking - critical thinking) and

the motivation of achievement for the experimental group. Statistical significance between the average of the students of the experimental group in the tribal and remote measurements for the variable achievement of the first semester marks (creative thinking - critical thinking) and motivation for achievement in favor of the group Therapies.

METHODOLOGY

Procedural definition: A set of reading texts included in the curriculum prepared by the Iraqi Ministry of Education for the students of the fifth primary for the year 2017. Research objective and hypothesis: This research aims to: Building a proposed teaching style according to the skills of productive thinking and Learn the effect of the proposed method in developing the productive thinking skills of primary school students in reading. The hypothesis of the research: "There is no difference in statistical significance at the level of significance 0.05 between the average grade of students in the fifth grade of primary in the applications of tribal and post-test skills of thinking product» Table 1. Determination of the educational material: The researcher identified the article in agreement with the teacher of the Arabic language and also comes (education and mothers, the caliph and the world, and visit the city, and Hamolabi and Bilbly). Building the proposed learning method: Use the researcher after reading and reading the literature and websites steps of the educational method as follows:

Raise the motivation of students towards new learning.

Reading the text of the teacher and pupils.

Inferring: Thinking beyond the information available to fill gaps

Predicting: Using previous knowledge to add meaning to new information and linking it to existing knowledge structures. Elaborating and Resenting: Developing basic ideas and information given in important detail and additions that may lead to new products, and adding new meaning to the information by changing its image (represented by symbols, diagrams or diagrams). Summarizing, Restructuring: Shortening the subject and abstracting it from the main ideas in an effective and practical way, and modifying existing knowledge structures to incorporate new information. Scheduling the experiment in time for execution and evaluation: Specify the time required to perform the experiment as shown in the table 2. The evaluation included the evaluation of experts and arbitrators: The researcher presented the proposed educational method to a number of experts and arbitrators to validate it, and tried the proposed method on a number of students. The researcher tried the proposed program on (55) students - without the research sample - to verify their ability to interact Positive with the curriculum followed in the proposed teaching style.

Search Tool (Test Product Thinking Skills)

The researcher proceeded to build the research tool according to the following procedures and steps:

1. Review previous studies and research that dealt with language skills in general and thinking skills and thinking in particular.
2. Prepare a list of the thinking skills required by the research sample.
3. Selection of a set of texts to build the test paragraphs.
4. Preparation of the test paragraphs and presented to the arbitrators.
5. Choose the search group randomly.
6. Coordinating with the school administration to implement the necessary procedures and apply the tests.
7. Selection of a group of students sample exploratory, in order to know the appropriate time for the test and measuring the stability and honesty and the strength of discriminatory paragraphs and the level of difficulty and effectiveness of the alternatives wrong.
8. Apply the test on the sample of the study and monitor the results and analysis

Statistical Methods: The researcher used the following statistical methods: (one test for one sample, Pearson correlation coefficient, coefficient of difficulty and ease, effectiveness of the wrong alternatives, paragraph discrimination coefficient, and square.

RESULTS AND DISCUSSION

The researcher reached the following results as

in Tables (3) and (4): Table (3) shows that there are statistically significant differences in productive thinking skills, because the calculated value of (4.77) is smaller than the scale value of (1.96) at the level of significance (0,05) A decrease in sample performance in the test of product thinking skills. Table (4) shows that the average scores of pupils in the tribal application (11.5) and the difference (32.83), while the mean of the same group in the post application (31) degree, the variance (43.9) (T-test) for one sample found that the calculated T value was (5.46), which is greater than the tabular value of (2.02) at the level of significance (0.05), which means rejecting the null hypothesis and accept the alternative hypothesis "There are statistically significant differences between students in the two applications Tribal and remote testing and in favor of post-test application "and thus can be said:

1. the weakness of students thinking skills product.
2. Despite the importance of thinking skills, but it has not been assigned a curriculum or lesson that students can practice.
3. Lack of interest in interactive teaching in the teaching of the Arabic language led to the low level of students in the skill of productive thinking.
4. The proposed educational method has a positive impact on the development of skills among primary school students.
5. the possibility of developing the skills of thinking product using the integrated method and the ability, and the physical potential, and the conditions for its application.

Interpretation of the results: The researcher believes that the proposed educational method provided the students who studied in light of a better opportunity in terms of conservation, memory, understanding, attention, application and analysis of the main skills and sub-thinking produced through the creation of learning as well as the analysis of the proposed educational content and organization cumulatively from simple to complex; In the use of the above learned mainly in the most complex learning, especially when directed to the transition to the effectiveness or new information without prior mastery, as well as the proposed method of education was given sufficient opportunity for feedback (feed_back), which provided the student with The success of this step-by-step process has led to the reinforcement and encouragement to continue learning. The student feels that he has learned something successfully and this increases his motivation to continue studying.

Table 1. Shows the training needs of the sample students

Lesson	Title
The first	is to think beyond the information available to fill the gaps in it
The second	is to use the previous knowledge to add meaning to the new information and to link it to existing knowledge structures
The third	is to develop the basic ideas and the information given and to enrich them with important details and additions that may lead to new products
Fourth	add a new meaning to the information by changing its image (represented by symbols, diagrams or graphs
Fifth	Shortening the subject and stripping it of the main ideas in an effective and practical way. To modify existing knowledge structures to integrate new information

Table 2. Shows the times of implementation of the training program

n	Themes	Time
1	Education and mothers	40 minutes
2	Caliph and the world	40 minutes
3	City visit with two lessons	80 minutes
4	The Hammurabi obelisk is	40 minutes
5	Balbly	35 minutes

Table 3. The mean, the mean, the standard deviation, the degree of freedom, the two values, and the statistical significance of the sample of the research in the test of the tribal product

N	mean	The mean medium	standard deviation	df	t		Statistical significance level (0.05)
					Calculated	Table	
140	5.11	8	2.55	139	4.77	1.96	Statistical function

Table 4. Shows the arithmetical mean, variance, and T calculated and tabular value of students in pre and post-test applications

The experimental group	mean	variance	t	
			Calculated	Table
Tribal	5.11	32.83	5.46	2.02
after	31	43.9		

CONCLUSION

The sample was selected from the center of Babylon Governorate, and the use of the relevant skills, such as percentages and t-test, and the search results in a list of the skills of thinking and the building of the method. The results of the study showed that the proposed educational method has an impact on the development of productive thinking skills among primary school students.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Faculty of Basic Education, University of Babylon, Hillah city, IRAQ and all experiments were carried out in accordance with approved guidelines.

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The Effectiveness of the Token Reinforcement in Reducing The Aggressive Behaviour Among Pupils With Learning Difficulties

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ABSTRACT

The study aims to identify The Effectiveness of The Token Reinforcement in Reducing The Aggressive Behaviour Among Pupils With Learning Difficulties, the researcher adopted the experimental approach with one group with pre- and post- test, the research sample consisted of (8) pupils with learning disabilities and before apply the program, the researcher applied the measure of The aggressive behaviour in order to identify their behavior problems before apply the program, then the program was applied that made up of a group of activities , games and videos that be a suitable for the problem of The Aggressive Behaviour that they suffer from, so the program made up of (15) sessions, whereas the aggressive behaviour is reduced, after the program was completed , the researcher applied the measure of The aggressive behaviour phenomenon on the research sample in order to identify the variables that happened before and after applying the program, then the data have been statistically processed by Wilcoxon Test, the results have presented the effectiveness of the token reinforcement that leaded to reducing the level of the aggressive behaviour among pupils in the research sample.

Keyword: *Reinforcement, Pupils, Effectiveness.*

INTRODUCTION

It's undeniable that, care of children and attention to them is considered the bedrock of building a strong family with drops and well-establishment, in order to create a good and successful children , it's necessary to pay attention and upbringing of them in the correct way, but upbringing of normal children in general and special needs children requires attention and care of them, and provide them with psychological and educational programmes of their own, that's for the negative effect of disability on the individual level (Disabled Child), at the family level and society as well, as is known, the disabled child has a special building and psychological creation, as a result of his/her disability and his/her sense of difference from other children, disability leads child to disturb his/her image of him/herself, this results in a lack of harmony with him/herself and others, therefore there are some behavioral problems such as : aggression, hyperactivity, introversion, withdraw and other forms of turbulent behavior. Kaval and Mostert (2004) [1] refers to that several of researchers believe that a lot of researchers believe that academic difficulties can't be dealt with, in isolation from the effective and social aspects which in turn overcome these difficulties, then pupils with learning difficulties are the most pupils who cause behavioral problems based on the teachers' viewpoint inside The class room whereas these pupils appear behaviors and obstructing manners for the progress of the classroom creating an chaotic environment within the classroom, this leads to the formation of a serious obstacle to all pupils of what the pupils with learning difficulties and teachers by frustration and discomfort as a result to chaos and didn't achieve the educational task. The majority of pupils with learning difficulties who face problems in keeping pace with others, making friends and keeping them positive emotions about themselves. At the same time, some are aggressive toward others, including partners, while others are shy and withdrawn in social situations and interactions.[7]. Pupils with violent behavior described as they don't have the ability to have friendships with the persons around them, as there are elements that lead to keeping others away from these troubled children, as they hurry towards violent behavior, abuse and irresponsibility, and the tendency to control and impulsive and excessive activity that leads to overheating Movement and distraction. On the

other hand, part of the responsibility be on the adults, whereas they don't spend time with these children, and if they spend part of their time and any of them makes a behavior of turbulent, they punished him! So it isn't shocking that these children become confused, trying to spoil everything that surrounds them with anyone close to them. Thus, the problem be not only in the behavior of the child or in the surrounding environment, but branches from its importance in terms of lack of an appropriate interactive relationship between the child and his/her environment [6]. Aggression is one of the most serious social problems in the modern time, as it's a huge problem because it combines between the psychological, social and economic impact on the person and society. It's not easy, not only because of the pain caused by violence, wherever there is any action of violence can produce more of violence actions, so violence creates violence. [3]. As a result of the increasing interest of those who are interested in the category of children with learning difficulties and don't suffer from any other disabilities of hearing, eyesight, emotion or physical, environmental deprivation, cultural deprivation or unusual circumstances, and those normal persons with learning difficulties or abnormal in of their intelligence and level of adaptation Have intermediate or above average IQs and adaptive behavior standards. However, they have difficulties in learning academic skills such as reading, algebraic and writing, and they fail in attention skills, reinforcement and awareness [4]. There is no doubt that the teacher play an important role in the educational process of learning and his role in influencing the behavior of students is known, for example, it's need to find ways to lead the attention of pupils and their energy towards the achievement of school, so it work to control class, reduce aggressive behavior, and respect the class system [7]. The Token reinforcement is considered a type of positive reinforcement that has verified to be effective in the behavior modification process. It's called the Token reinforcement with the replaceable reinforcement, which is the physical things that the individual gets when performing the acceptable behavior, which is to be strengthened and replaced it later by many different reinforcements [13]. Token reinforcement programs are considered one of the most behavior modification methods used, which is an exchange system where individuals whose behavior is modified are fed instant feedback, in how appropriate their behavior [12]. It must be emphasized that it's necessary that children be given token reinforcements every day and have full freedom to delay or replace the reward immediately [8]. The use of methods that include physical reinforcement in the classroom has been developed by token reinforcement, depending on the degree of coupling of the material reinforcement by providing a desirable event, reduces the time between aggressive behavior and reinforcement whereas it can be presented immediately after aggressive behavior occurs. In additional to that the token reinforcement is an indication of providing variable reinforcement thus it guarantees the effectiveness of reinforcement with different people at different times, token reinforcement doesn't work on disrupt the series of behavioral responses that undertaken by the pupils [9]

METHODOLOGY

Include a presentation of the procedures that have been done to achieve the research aims, starting with the research methodology and the experimental design and identify the community and the sample of the research, preparing the requirements and instruments of the research, and presentation of statistical methds used, the nature of the research require an experimental approach, which means the method that the researcher stitches all variables that impact in any phenomenon, except the variable independent experimental in order to measure its effect on the phenomenon (dependent variable).

The Experimental Design for The Research

It includes one independent variable which is (token reinforcement), and dependent variable (The Aggressive Behaviour), so the researcher used the experimental design with one group with the pre- and post-test.

The community and Sample of the Research

The community of the research represents pupils with learning difficulties in the fourth class of primary, all of them belong to the primary school which belongs to Directorate General of Education in Babylon (city center), for the academic year (2017-2018), while the researcher selected the research sample of (Al-Jazraah Primary School) in Babylon , intentionally to make her research, after choosing (Al-Jazraah School) the researcher found out that the school consists of (131) pupils, aged between (9-11) years, the researcher applied the aggressive behaviour scale to determine the children who have aggressive behaviors, after applied it , the researcher found that (8) pupils got the highest scores on the measure of aggressive behaviour, so the research

sample consisted of (8) pupils, who will apply (The token reinforcement) on them.

The Instrument of the Research

An instrument was prepared to measure the aggressive behaviour among the pupils (the research sample), preparing the instrument requires the following steps:

Prepare the measure items

Through the knowledge of the researcher on literatures that related to research variables and scales of the aggressive behaviour, the researcher used items of measure aggressive behaviour that are (16) items represent the aggressive behaviour, multiple choice questions are given (Always , often , sometimes , rarely and no applicable), the scores are given respectively (1,2,3,4,5), thus the highest score of measurement is (80), the minimum for measurement is (16) and the mean hypothesis is (48) scores.

Prepare the measure instructions

The aim of the instructions is to explain the idea of the scale in its simplest form to facilitate the application of the scale because the clear and understandable instructions contribute to raising the coefficients of the validity, stability and objectivity of the scale, In order to rely on the scale, it's necessary to extract its cyko-metric properties:

The measurement validity

The results showed that the apparent validity achieved 80% of the agreement by the arbitrators and specialists. As for the validity of the construction, the results showed that all the items of the scale are statistically significant, so the measure is true in measuring aggressive behavior.

The Pilot Application for Measurement, includes

The First Pilot Application

The level of aggressive behavior in the first pilot phase was applied to a group of fourth-class pupils of primary with learning disabilities without a research sample. The number of children was (30) pupils. The aim was to know the clarity of the test instructions, the understanding and clarity of the test items for pupils and according to the time required for the test.

The Second Pilot Application

The test was applied to a sample of (100) pupils in the fourth class of primary without a research sample, and its purpose is to analyze the items of the measurement statistically.

Discrimination of the Item

One of the most important characteristics that must be provided in the items of the scale is the distinguishing feature and the possibility of items or items in the detection of pupils who have the measured and the pupils who don't own them. The value of the coefficient of discrimination between the scales ranged from (2,010-4,587), thus considered all the measurement items with discrimination and suitable factor.

The Measurement Stability

Estimation of the stability is considered one of the characteristics of the good measure, although validity is more important than it, because the validity measure is stable and may not be a stable measure is validity because it may be homogeneous in items, but may measure a property other than that prepared for measuring, and to achieve the stability of the scale was found Stability in a retest method. The Retest Method : The retest method is a direct method to determine the stability of the test, that is depended on the applying of the test two consecutive times on the same homogeneous group representing the original community of persons. If the test is completely stable, the score of each individual in the first application will be fully predicted by its score in the second applying of the test, the researcher re-applied the scale on the first pilot sample, and the researcher calculated the Pearson correlation coefficient between the first and second applications of the scale, which is (0,79), that is a good stability coefficient.

Statistical Methods Used

The researcher used Wilcoxon Test to compare between the marks of pre- and post-test in order to measure the aggressive behaviour.

RESULTS AND DISCUSSION

When the researcher selected the research sample and applied the measure of aggressive behavior, the program was then applied to the selected sample. The aggressive behavior measure was applied to the sample

before applying the token reinforcement. After the token reinforcement applying, the researcher used the Wilcoxon Test to identify the differences between the pre-test and post-test as in the table 1. According to the table above, the results showed that the calculated value is (-W=zero, the least repetitive value), which is less than the ruler value of (4) at the level of significance (0.05), which refers to the differences between the marks of pupils with learning difficulties, before and after apply the program, for the favour of the post-test, so thus decline the null-hypothesis and accept the alternative hypothesis, figure (1). Moreover, the researcher used (Mac-Jojian) equalization to derive the effect size of the program's effectiveness between the pre- and post-test for violent behavior, table 2. The table above explain the value of the effect size of the program effectiveness, which was (0,768), which is a suitable value to interpret the effect size, Roebuck (1973) refers to that the effectiveness of effect size must increasing more than (0,60) in order to the program being active. [11]. The current results refer to the effectiveness of the program that is used in reduce the aggressive behaviour among pupils with learning difficulties in the fourth class of primary, so the results showed that the pupils who have been subjected to the program have been reduce the aggressive behaviour among them in comparison with what were they before apply the program. The researcher attributes that reason to (the effectiveness of the token reinforcement) which is used in the research, that was able to reduce the aggressive behaviour among the pupils with learning difficulties (the research sample), so this refers to that the program has a positive effect in reducing the aggressive behaviour which is represented in increasing the suitable responses in the classroom, and appearance of the attention situations, don't disturb the teacher, don't transfer from one place to another in the classroom, don't quarrel with pupils and joining in the class activities significantly.

Table 1. The comparison between the marks of pre-test and post-test on the measure of aggressive behavior

No.	The Pre-Test	The Post-Test	Distinctions	Absolute Distinctions	Grades of Distinctions	Sign of Distinctions Grades
1	64	30	+34	34	3	+3
2	64	20	+44	44	8	+8
3	60	30	+30	30	2	+2
4	63	20	+43	43	6,5	+6,5
5	54	28	+26	26	1	+1
6	63	21	+42	42	5	+5
7	62	23	+39	39	4	+4
8	62	19	+43	43	6,5	+6,5
						+W = 36 -W = Zero

Table 2. The effect size of the program effectiveness

Situation	The Sample N	The mean marks of pre-test	The mean marks of post-test	The highest mark on the criterion	the effect size of the program effectiveness
The Aggressive Behaviour	8	61,5	8	80	0,768

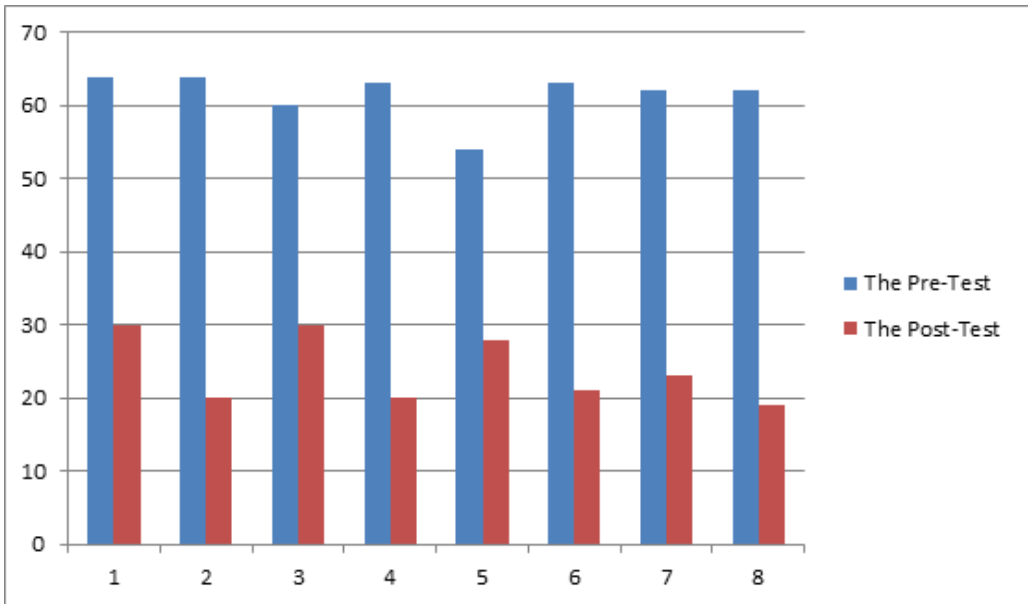

Figure 1. The Differences Between The Pre-test and Post-Test Marks (The Aggressive Behaviour)

CONCLUSION

researcher applied the measure of the aggressive behaviour phenomenon on the research sample in order to identify the variables that happened before and after applying the program, then the data have been statistically processed by Wilcoxon Test, the results have presented the effectiveness of the token reinforcement that leaded to reducing the level of the aggressive behaviour among pupils in the research sample.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Basic Education, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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Effects of Silver Nanoparticles on Biofilms of *Streptococcus* Spps

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ABSTRACT

Today technology using nanoparticle when treatment pathogentic microorganism and we focused on this here. It was found that the species of streptococcus used in present study were sensitive to erythromycin. In present study focusing biofilm formation by *Streptococcus* spp was evaluated. Species *S. mutans* was found that highest amount of biofilm compare with the other species. The aim of report effect (SNPs) on ability of biofilm form different species of streptococcus. The anti-biofilm effect of SNPs was in concentration dependent manner. The highest effect of SNP against biofilm formation was found the concentration 160 µg/ml, while the lowest effect was found the lowest used concentration (80 µg/ml) of SNPs. In vivo study revealed that silver nanopasrticles treatment of *Streptococcus pyogenes* contaminated injured skin showed good prognosis and good healing process include complete regeneration of the epithelial cells of the epidermis and increase of cellulartiy of the dermal content compared with untreated group. In conclusion, treatment of skin infected with *S. pyogenes* using silver nanoparticles concentration (160 µg/ml) may limited the skin damage, localized the lesion to the incision site and enhance the healing process.

Key words: *Biofilm, Silver nanoparticle, Streptococcus.*

INTRODUCTION

Streptococcus mutans has dental caries with helping some host factors gave evidence that this species related with teeth infection. There is an accumulation of dental plaque on the surfaces of teeth. Secondary caries occurs under the restorations is increasing the risk of dental plaque. Increase of plaques on resin is related to the surface (such as roughness of surface), which is depended to filler size, resin type and the percentage of filler composite) *in vitro* resins to increase number of bacteria or plaques [1]. *Streptococcus pneumoniae* (pneumococcus) shown that colonize the as biofilms (nasopharynx) and we have this biofilm phenotype in vitro using nasopharyngeal environment [2]. In Gram positive bacteria (Quorum sensing) has been found to regulate a number of physiological activities, including in *Streptococccus gordonii, S. pneumoniae,* and *S. mutans* [3]. Periodontal diseases forming in Dental plaque is causes a bioflm in the human body such as (periodontitis, gingivitis and dental caries). Many researches inhibit the formation of dental biofilms and to remove mature bioflms. Te major (inhibit or remove dental plaque) is susceptibility to irritation in oral mucosa [4] Most serotype 2 (SS2) of Streptococcus suis clinical isolates can form biofilm, which contribute to persistent infection, transmission and difficulties to eradicate infection [5]. *In vitro* Particularly the biofilm phenotype was evaluated with isolate collections and for many of the clinically relevant under static and flow conditions [6]

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MATERIALS AND METHOD

Indicator isolates

The major identified tests (morphological and biochemical) ,these isolates were by according to [7] were obtained from College of Science for Women/ Department **of Biology /University of Baghdad.**

Confirmation of *Streptococcus spps* and Antibiotic

Resistance testing:

All isolates *Streptococcus spps* the cultures were grow on (MHA) plates at 37 C for 18 hrs. The zone of inhibiter (mm) disk around compared with a documented standard the zone of inhibition in (mm) around each disk Clinical and Laboratory Standards Institute. The antibiotic susceptibility against using Ampicillin, Ciprofloxacin, Erythromycin, Azithromycin and Chloamphinicol [8].

Preparation of nanosilver suspension: Silver nitrate in the beginning put under low effects of polyaldehyde. Effect of surface activator decreased silver particles affinity to attach a solution with silver particles in nanometer size. To ensure the particle size, intensity test was made in the solution. Average size of silver particles was from 2 to 6 nanometers that measured by dynamic light scattering method. In microbiology laboratory a pilot experiment was done to find out the antimicrobial effects of silver nanoparticles against *Streptococcus* spps, the standard method of Clinical and Laboratory Standard Institute was followed [9].

Determining the MIC of Silver nanoparticle

Two grades of silver nanoparticles; first, suspended in normal saline exposed to ultrasonication for 20 min. Two-fold dilutions were gained (80 and 160 µg/ml) used in present study. Two hundred of the bacterial suspensions of stock solution were inoculated into the corresponding test tubes containing different concentrations of Muller Hinton broth (MH) [10].

Biofilm assay

Method described by [11] was followed to achieve biofilm formation: To study the ability of adherence Streptococcus isolates, were grown in Tripticase soya broth containing 1% glucose in 96-well polystyrene tissue culture plates and incubated at 37◦C for 24 h under aerobic conditions., The planktonic cells after incubation were washed 3 times with deionized water, and fixed with 200 µl of absolute methanol for 20 min the adhering cells in well and left to dry overnight. Were stained the adhering cells with crystal violet for 15min. The plates were washed with D.W and air-dried overnight. The crystal violate dye bound to the adherent cells was dissolved with 200 µl of 96% ethanol per well, and the plates were read at 490 nm using a spectrophotometer. The experiment was performed in triplicates, and the absorbance of wells containing sterile TSB was used as the negative control the result calculated as in table 1.

Detection Antibiofilm Activity of silver nanoparticles on pre-formed biofilm of *Streptococcus spp*

According to [12] Method followed for the inhibition of biofilm the isolates of *Streptococcus spp.,* were selected to be assayed according to inhibition activity of nanoparticles against planktonic cells of it on plate agar. Same protocol was added to each well produce a biofilm but (100 µl of Ag NPs). The plate was incubated for 24hr at 37 ºC. Wells were washed and stained after incubation period all, then absorbance was determined at (490) nm in an ELISA reader. With crystal violet binding to the wells exposed only to the culture medium with bacteria controls were performed.The following equation was used to calculate biofilm inhibition percentage [13].

Biofilm inhibition (%) = (Control OD- Test OD / Control OD) ×100

Experimental design

Twenty mice were divided into 4 groups, the mice in the first three groups (n=15 for each group) were anesthetized with an intraperitoneal injection of a mixture of xylazine (5 mg/kg) and ketamine (75 mg/kg), then the hair of the right flank was shaved (3×2 cm) using electrical shaver and the remaining hair was shaved using disposable hand shaver. The shaved area was cleaned by soap and sterile D.W., after drying wound in the skin was induced using sterile lancet in which 3 parallel line of superficial skin wound was made. The 4th group (n=5) considered as control negative group. The mice in the 1st group were considered as control positive group and the injured skin did not receive any treatment, while the injured skin of mice in the 2nd and 3rd group was contaminated by *Streptococcus pyogenes* using one drop from the bacterial suspension 1×10^6 cfu/ml (14). The injured skin of mice in the 3rd group was treated locally with silver nanoparticles concentration (160 µg/ml) by swab after 2 hr post infection and treatment repeated every 12 hr.

Histopathological Study

All mice were euthanized after 72 hr post infection and samples (1×2 cm) of injured skin were taken and fixed immediately in 10% formalin solution for 48 hrs,

then the samples were processed routinely and sectioned by microtome (thickness 4-6 micron) and the slides stained by Hematoxyline and Eosin stain [15].

RESULTS AND DISCUSSION

Isolation and identification of Streptococcus spp: a species of Gram-positive bacteria. These bacteria are aero tolerant and an extracellular bacterium, made up of non-motile and non-sporing cocci. It is clinically important in human illness as expected with a streptococci, but usually pathogenic, part of the skin microbiota. Figure (1) showen group A streptococci when grown on blood agar produces zones of beta-hemolysis, a complete destruction of red blood cells. It is thus also called group A (beta-hemolytic) streptococcus [16]. Antibiogram profile results for *Streptococcus* spp isolated from clinical samples the isolates showed multi-resistant to Ampicillin, Erythromycin, Chloamphinicol. These results agreed with All the isolates were sensitive to Ciprofloxacin and least resistance was observed towards Azithromycin. The result agree with (17) shows a high frequency of resistance to erythromycin particularly in countries where antibiotics are overused. Of all throat isolates, 95.0% were predominantly resistant to erythromycin, 70.0% to clindamycin and 24.0% to clarithroycin. To evaluate the in vitro antibacterial effects of SNPs against *S.viridans*, *S. pneumoniae* , *S. mutans* and *S.pyogenes* at (40,80 and 160) µg/ml concentrations of SNPs were added to Petri dishes before pouring plates with (MHA). Uniform agar plugs with a diameter between (9-13) mm Table (1) and Figure (1). The small particles have large surface area as compare with same amount of big particles. Silver nanoparticles in diameter 5-32 nm improve antibacterial effect of different antibiotics [18]. Silver nanoparticles attach and make a way into Gram-negative bacteria [19].

Biofilm formation

The results of current study showed that all *Streptococcus* spp., were strong biofilm producer when detected them by microtiter plate method, and compare it with control (broth medium only without bacteria), see table (3). *S. pyogenes* has high ability to produce biofilm as compared with other species of Streptococcus in oral cavity [20,21]. This species in biofilm form has some proteins in comparison to planktonic cultures that increase exopolyphosphatase expression and decrease lactate dehydrogenase or pyruvate kinase expression [22]. Biofilm is clinically important because this phenomenon interfere with susceptibility of bacteria to antimicrobials[23].

Antibiofilm activity of silver nanoparticles:

The antibiofilm activity of Ag NPs was carried out by using microtiter plate method, the results showed that all concentration of Ag NPs were affected against bacterial biofilm of Streptococcus spp., but in different percentage depending on the specied of bacteria and the concentration that was used.The concentration one gave highly effect against *S. pneumoniae* and *S. pyogenes* in percentage of inhibition (87%), but effect on *S. mutans* and *S.viridans* in percentage (65% and 51%) respectively. The second concentration show highly effect against *S. pyogenes* in percentage (92%), but other strain reached in percentage (79%) respectively, the last concentration show approximately the same results of second concentration on *Streptococcus* spp in the percentage of inhibition (92%, 82%, 79% and 77%), see table (2). This result agrees with present study Pérez-Díaz *et al*. (2015) showed that nanoparticle inhibited effective the growth of a planktonic S. mutans clinical isolate and killed established *S. mutans* biofilms, which suggests that could be used for treatment of dental caries. The anti-biofilm effect of AgNPs was observed less effective against G+ve bacteria than on that of G-ve bacteria, this remark happened because the structural difference in the cell wall of G+ve and G-ve bacteria. Other study revealed that AgNPs have antibiofilm ability against G+ve and G-ve bacteria when catheters coated with AgNPs were tested in vitro observed almost complete prevention of biofilm formation by *E.coli, S.aureus* and *C. albicans*. AgNPs show the anti-biofilm activity that is why; used in coating of catheter to treduce biofilm formation of several species of bacteria such as *Pseudomonas aeruginosa*. Similar applications of using of AgNPs were used in the dental applications. The histopathological changes in group 1 (positave control) showed incomplete regeneration of the epidermal layer in the incision site under cellular debries and neutophils aggrigation, also the mild neutrophils infilteratin in the dermis and subcutanous tissue. The 3rd group (treated group) showed complete regeneration of the epithelial cell of the epidermis with mild degeneration and increase cellulartiy of the connective tissue of the derims, other section showed mild hyperplasia of epithelial cells of the epidermis. *In vivo* study showed that, histological

changes in mice skin of the first group characterized by infiltration of inflammatory cells (mainly neutrophils) during 48 hr of injury, and this indicated the first phase of normal wound healing process, while the present of fibrin plug and infiltration of fibrous connective tissue in the dermis are a normal responses represents a part of the normal healing process of the skin in immune component animal. *S. pyogenes* cause infection of skin and soft tissues with diverse clinical entities, so histopathological changes in the skin of mice in the second group showed severe damage in epidermis, dermis and subcutaneous tissue and this may be contributed to the exotoxine streptolysin O (SLO) which is produced by all strains of *S. pyogenes* and it is toxic to many cell types such as leukocytes, endothelial cells and fibroblasts.

Table 1. Classification of bacterial adherence by tissue culture plate method

OD values	Adherence	Biofilm formation
< OD c	Non	Non
OD < OD ≤ 2*ODc	Weakly	Weak
2*ODc < ODt≤ 2*ODc	Moderately	Moderate
4ODc<OD t	Strong	High

Table 2. Antibacterial effects of Silver nanoparticle against different species of Streptococcus.

Nanosilver dilutions	Zone of growth inhibition In millimeters			
	S. pneumoniae	S. pyogenes	S. viridans	S. mutans
1	13	9	9.4	9.5
2	12.2	10	8	9
3	11.5	10.8	7	8

Table 3. Biofilm producing by *Streptococcus spp.* before treatment, using microtiter plate assay

Isolates	S.mutan	S.viridans pyogenes	S. pyogenes gonorrhoeae	S.pneumoniae mutans
O.D	1.160	1.221	2.604	0.875
Biofilm producing	Strong	Strong	Strong	Strong

Table 4. The effect of silver nanoparticles against first step of biofilm formation in *Streptococcus* spp.

Bacteria	S. viridans viridans	S.pneumoniae	S. pyogenes	S. mutans
Control	1.160	1.221	2.604	0.875
Concentration 1	0.561	0.206	0.330	0.303
Percentage of inhibition	51%	87%	87%	65%
Concentration 2	0.240	0.152	0.194	0.222
Percentage of inhibition	79%	87%	92%	74%
Concentration 3	0.243	0.212	0.19	0.197
Percentage of inhibition	79%	82%	92%	77%

Figure 1. *S. pyogenes* on A) Brucella Agar B) Blood agar at 37°C for 24 hrs

CONCLUSION

In conclusion, treatment of skin infected with *S. pyogenes* using silver nanoparticles concentration (160 µg/ml) may limited the skin damage, localized the lesion to the incision site and enhance the healing process. Biofilm experiment revealed that all tested streptococcus species produced strong biofilm. On the other hand the results of antibiofilm study showed that silver nanoparticles gave highly effect against all *streptococcus* species biofilm in different concentration and with different percentages of inhibition.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Dep. of Biology / College of Science / University of Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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Activity Measurement of Airborne Alpha and Beta Particles in Destroyed Radiochemical Laboratories, at Al-Tuwaitha-Iraq

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ABSTRACT

Radiochemistry laboratories are one of the most destructive nuclear facilities in Iraq. It is contaminated by many isotopes that emit alpha or beta particles. The indoor air of radiochemistry laboratories was monitored to determine alpha and beta concentrations by used the alpha/beta intelligent Continuous Air Monitor (iCAM) device. Alpha airborne particulates come from radon/ thoron, whereas beta comes from background compensation. The concentration of R-222 and Rn-220 was found to be high in most samples measured inside the radiochemistry building, ranging from 12 to 52, and 0.08 to 0.41 respectively. The annual effective dose of exposure to radon and thoron ranged from 0.03 to 0.188. The concentration of radon and annual effective dose for workers are close to anxiety levels, especially in laboratories C1 and C2, since there is no guaranteed of good air exchange.

Keywords: *Radon, Thoron, airborne, activity, annual effective dose, radiochemistry*

INTRODUCTION

The primary risk associated with airborne radioactivity is through inhalation. The assessment of this risk is normally determined from measurements of activity concentrations of radionuclides in the various workplaces, combined with dosimetric calculations of the radiation dose arising from inhalation of tense atmospheres. These calculations are dependent upon the physical and chemical properties of each radionuclide, the nature of the suspended particles and on biological parameters. The liberation of radioactive particles into the atmosphere of the working areas is an accidental output of all activities involving radioactive materials. Even with a high degree of sophistication and safety in the working facilities. In accidents, the amounts of radioactive releases may vary depending on the types of operations and the amounts of radioactive materials involved [3]. The main source of internal dose comes from Inhalation of radioactive particles. Airborne radioactivity measurements are necessary to ensure that the control measures continue to be effective. Airborne radioactive particulate in nuclear facilities and during shut down the nuclear facility, as well as the contaminated area, will have a strong impact on the public dose if they are freed into the environment and especially into the dose received by workers. Airborne particles that occur from natural radioactive materials are radon and its daughters. Radon is a noble gas, colorless, odorless and tasteless, and an alpha emitter. The main naturally occurring isotopes of radon are Rn-222 (the daughter of Ra-226 in U-238 chain), Rn-220 (the daughter of Ra-224 in Th-232 chain), and Rn-219 (the daughter of Ra-223 in U-235 chain) [1,2]. Radon, thoron and their decaying products represent the largest contributors to the annual effectiveness from natural background sources of radiation. In a closed area where Rn-222 and Rn-220 can exist and where ventilation is limited, the levels of these radionuclides and their decaying products can accumulate to high levels. In order to provide adequate protection for workers, it is necessary to properly assess and control these contaminants. Therefore, the objective of this study is to measure the activity of airborne radioactive particles in the atmosphere of the radiochemistry building and to assess the risks to workers.

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Studied Area

Air samples were collected from the Radio Chemistry laboratory (RCL). RCL is a chemical research building at Al-Tuwaitha nuclear centre in Iraq (20km southeast of Baghdad, GPS Coordinates are North= 33°12'18.3", East= 44°30'58.9"). RCL was built in 1978 by SNIA TECHINT Italian Company. RCL was used to extract radionuclides and reprocess the irradiated fuel for the extracting of plutonium for research purposes; it was destroyed in the 1991 war. This building consists of laboratories, offices, health physics control rooms, air - conditioning room, underground storage tanks (SLA) for high level liquid radioactive wastes , as well as many types of equipment such as hot - cells, glove boxes, fume hoods and ventilation trap filters. Some areas the RCL building and all equipment are heavily contaminated. Some parts of the building are very destructive especially the ventilation system.

MATERIALS AND METHOD

Air Measuring

The Alpha/Beta intelligent Continuous Air Monitor (iCAM) was used to monitor the activity of airborne alpha and beta particles in the workplace. iCAM has a Passivated Implanted Planar Silicon (PIPS) detector to detect both alpha and beta activity, with 24% alpha efficiency up to 5.7Mev and beta detection for Cl-36 or Sr-90. The activity measurement was calibrated using two standard point sources, Am-241 and Sr-90 instead of the filter card. The air is withdrawn to the device at an average rate of 15-60 l/min and the particulate matter is deposited on a removable filter card 25mm (1inch) of glass fibre filter (Canberra, 2013). Each sample of air was taken within one hour and the average air flow was (40l/min).

Determine Concentrations of Radionuclide in the Air Filters

In order to determine radionuclide concentrations in air filters, the high-performance digital signal processor was used for gamma-ray spectrometer (DSPEC LF ORTEC) at a low background. The gamma-ray spectrometry system consists of a high-purity germanium (HPGe) detector of P-type with a diameter of 65mm ×50mm length with passive shielding (ORTEC). The energy calibration of the gamma spectroscopy system was performed using a mixed standard source, 550ml Marinelli beaker, containing Am241, Cd-109, Co-57, Co-60, Sn-113, Hg-203, Y-88, and Cs-137. The efficiency calibration was performed using point sources (Am-241, Cs137137, Eu-152 and Na-22) with a diameter 25mm (1inch) to maintain the continuous counting geometry of the air filter card.

Dose Calculation

To assess the risk of an effective dose of radon and thoron, the effective dose can be evaluated as follows (UNSCEAR, 2006; Chege et al., 2015; Yamada et al., 2006):

Where is the concentration of radon or thoron in , is the dose conversion factor taken (9nSv/(Bq.h.m^{-3}) for radon and (40nSv/(Bq.h.m^{-3}) for thoron, is the indoor equivalent factor of 0.4 for radon and 0.1 for thoron, is the number of exposure hours per year.

RESULTS AND DISCUSSION

The concentration of airborne radioactive particles varies from place to place in the same laboratory because of the laboratory environment that contains floors and equipment (hot cells, crates and foam hoods) contaminated with different concentrations and isotopes. Airborne radioactive particles (iCAM) have been measured at different locations within the radiochemistry laboratory building. Figure 2 shows the locations of air samples in the block diagram of the radiochemistry laboratories. Table 1and 2 summarizes the data obtained from iCAM as well as the effective dose calculated from one-hour exposure to radon and thoron. Table 3 shows the measurement of the filter in a gamma-ray spectrometry system. Figure 1 shows the radon and thoron concentrations in all samples. The highest concentration of radon and thoron was found in C2 laboratories with average values of 41.7 and 0.34 respectively, as well as in C1 laboratories with an average values 31.3 and 0.16 respectively. The high concentrations of radon and thoron can be explained by the presence of highly contaminated areas and equipment in C1 and C2 laboratories, which are larger than the rest of the sites. For the same reason, it was observed that the concentration of integrated alpha and beta airborne activities was higher in the same samples as shown in figure 2. The concentration of alpha integrated airborne activity within the radiochemistry building was 0.150–1.78 , also the concentration of integrated beta airborne activity was 9.9 – 55.8 . Air filters were measured in

gamma-ray spectroscopy system, where some samples contained Cs-137 isotope, especially in laboratories C1 and C2 near the equipment from which samples were taken. Table 3 shows that the presence of Cs-137 in the air filter is due to the fact that the polluted dust that covers the equipment can volatilize into the air. The effective dose was calculated for 1 hour from exposure to radon and thoron using equation1. Table 1 shows that the annual effective dose is based on the number of work hours per year. The workers stop the operation in the decommissioning of nuclear facilities at the rate of 1000 hours per year, i.e. 4 hours a day in this work. Figure 5 shows the annual effective dose inside radiochemistry laboratories. The annual effective dose of exposure to radon and thoron inside the radiochemistry laboratories ranged from 0.03 to 0.188 while the annual effective dose inside laboratories C1 and C2 was 0.11 and 0.15, respectively.

Table 1. Indoor Rn-220, Rn-222, α β integrated airborne activity concentration and Effective dose inside radiochemistry laboratories.

Sample No.	α β integrated airborne activity concentration		Rn-222	Rn-220	Effective dose		Location
	α	β			R-222	R-220	
1	0.500	22.3	28.5	0.12	102; .6	0.48	C1
2	0.625	25.5	30.4	0.18	109.44	0.72	
3	0.690	35.4	34.0	0.21	122.4	0.84	
4	0.740	33.0	32.3	0.13	116.28	0.52	
5	0.290	16.0	20.1	0.17	72.36	0.68	Corridor
6	0.315	19.3	20.4	0.19	73.44	0.76	
7	0.380	9.9	15.1	0.09	54.36	0.36	B5
8	0.203	11.7	12.0	0.08	43.20	0.32	B6
9	0.319	15.4	12.9	0.08	46.44	0.32	B7
10	0.150	13.0	8.5	0.09	30.60	0.36	B9
11	0.450	12.6	15.7	0.10	56.52	0.40	B10
12	1.780	55.8	52.0	0.41	187.2	1.64	C2
13	0.806	30.5	31.9	0.34	114.8	1.36	
14	1.010	50.0	48.0	0.32	172.8	1.28	
15	0.800	29	35	0.30	126	1.2	
16	0.310	19	20	0.1	72	0.4	C3
17	0.400	23	24	0.23	86,4	0.93	SLA
18	0.380	19	20	0.09	72	0.36	

Table 2. Outdoor Rn-220, Rn-222 and α β integrated airborne activity concentration.

Sample No.	α β integrated airborne activity concentration ()		Rn-220 ()	Rn-222 ()	Location
	α	β			
19	0.09	4.5	3.7	0.040	Outside building
20	0.16	3.6	3.7	0.038	
21	0.05	3.1	3.2	0.037	Al-Tuwaitha site
22	0.04	4.9	3.7	0.044	
23	1.033	44.6	20.1	0.170	Ventilation system

Table 3. Measuring samples filters in gamma-ray spectroscopy system.

Sample No.	Cs-137 (	Bi-214 (	Sample No.	Cs-137 (	Bi-214 (
1	-	3.15±0.9	13	-	7.51±0.8
2	0.3±0.1	3.71±0.5	14	0.80±0.1	9.10±0.9
3		5.60±0.7	15	-	8.07±1
4	1.08±0.2	4.50±0.9	16	-	3.5±0.4
5	-	4.04±1	17	-	2.1±0.2
6	-	3.87±0.8	18	-	1.89±0.2
7	-	-	19	-	-
8	-	-	20	-	-
9	-	-	21	-	-
10	-	-	22	-	-
11	-	-	23	0.55±0.2	8.7±0.9
12	0.60±0.2	9.53±1.3			

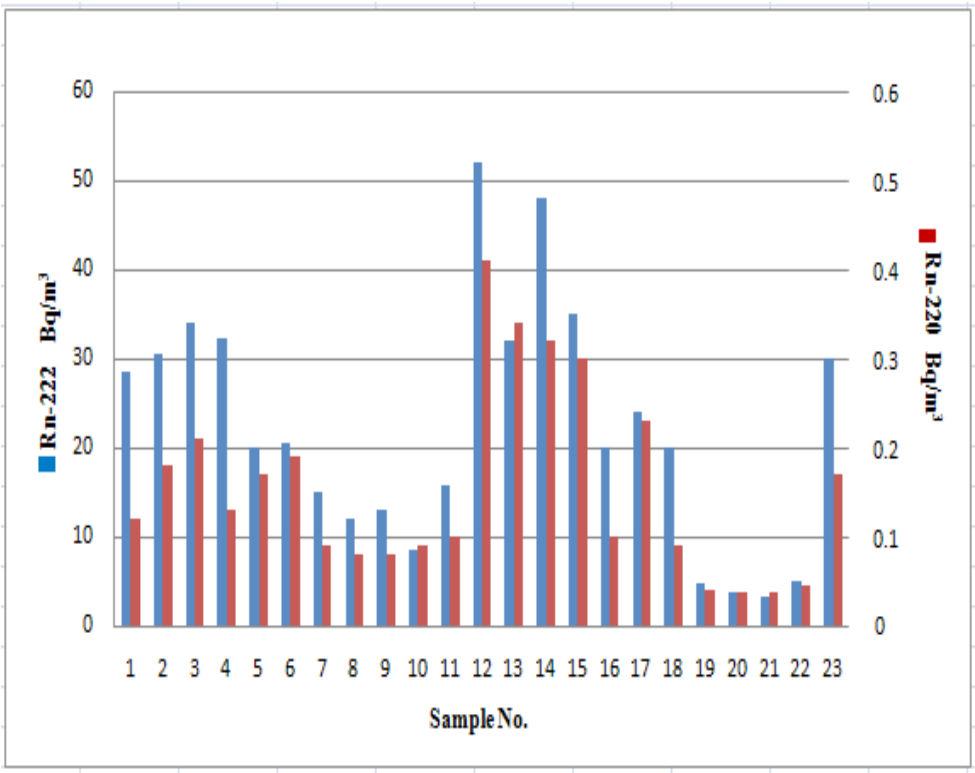

Figure 1. Radon and Thoron Activity Concentrations.

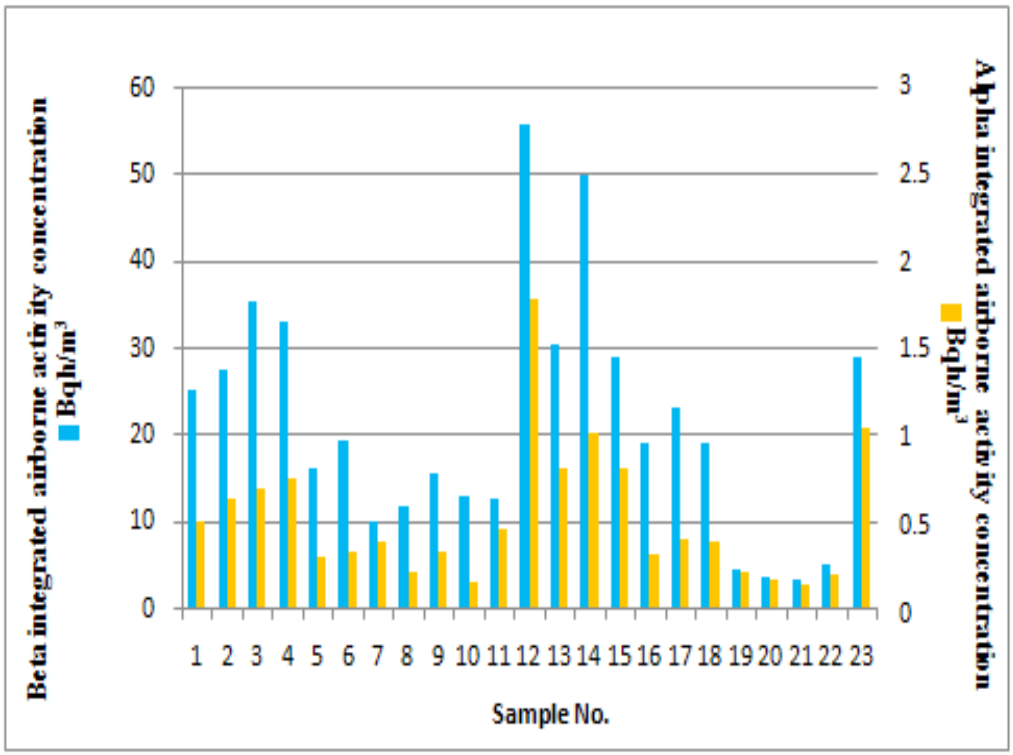

Figure 2. Alpha and Beta integrated airborne activity concentrations.

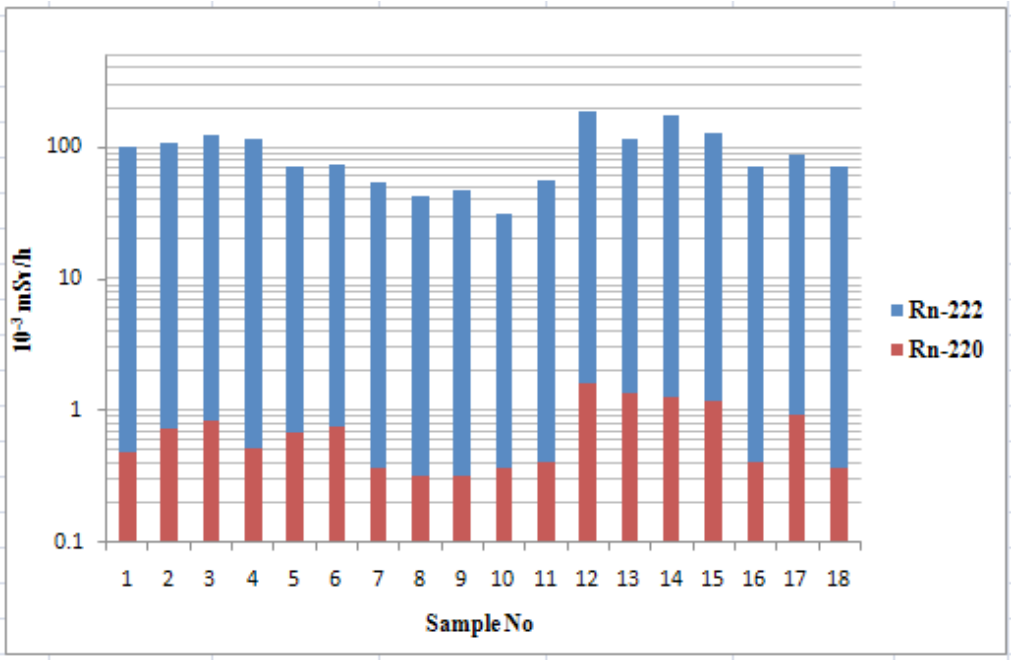

Figure 3. Annual effective dose of exposure to radon and thoron.

CONCLUSION

The results show that radon concentrations are high inside the radiochemistry laboratories building, especially in C1 and C2 laboratories, because they contain highly contaminated areas and equipment. Also due to the closure of the building and very bad ventilation system, this contributed to the increased concentration of radon. Airborne radioactive particulate was measured via *i*CAM inside radiochemistry laboratories where the concentration of radon activity (12-52) and thoron activity concentration (0.08-0.4) were found. The annual effective dose of workers was calculated at the decommissioning of the nuclear facilities, where they were found to range from 0.03 to 0.188

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Physics, College of Science, Al-Mustansiriyah University, Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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Antibacterial and Anti virulence Factors activity of ZnO nanoparticles Biosynthesized by *Lactococcus lactis* ssp. *Lactis*

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ABSTRACT

In the present we are used a probiotic bacteria *Lactococcus lactis* ssp.*lactis* which is isolated from fish intestine to produce ZnO nanoparticles. Then we conformation the synthesized of nanoparticles using different techniques such as atomic force Microscopy (AFM) X-ray diffraction (XRD): technique, Fourier Transform Infrared' Spectroscopy (FTIR), Scanning Electron Microscopic (SEM) and Energy-dispersive X.-ray analysis (EDX) spectra .The results of characterization showed that the nanoparticles are hexagonal ZnO crystal structure, spherically shaped with a diameter of about (31-36)nm. The biosynthesized ZnO nanoparticles were tested against pathogenic bacteria isolated from skin infections included *Pseudomonas aeruginosa*, *Acinetobacter baumanii*, *Klebsiella pneumonia,* and *Staphylococcus aureus* . The activity of ZnO nanoparticles as antimicrobial agent was measured via the investigation of the minimum inhibition concentration (MIC). The ZnO nanoparticles had antibacterial activity, the MIC ranged between (25 -100) mg/ml. The anti-virulence factors also determined against tested bacteria. Results showed that the ZnO nanoparticles had ability to inhibit virulence factors the ability of β-hemolysin, urease and pyocyanin production were decreased after treatment with biosynthesized ZnO nanoparticles, also the best effect has been shown in biofilm formation after 72 h forall isolates, with high inhibition 62.18% against *K.pneumoniae* (*K6*).

Keywords: *Biosynthesis, ZnO nanoparticles, Lactococcus, Inhibitory effect, Skin infection causative bacteria, virulence factors.*

INTRODUCTION

Bacteria of lactic acid are un important microorganism in industrial microbiology; they are used in fermentation process, and in nutrition benefits. It is able to produce antimicrobial substances that used as foods preservatives. LAB has ability to produce chemicals materials such as hydrogen peroxide, organic materials, and Co2. In addition to produces low MW antibacterial substances, and bacteriocin which is used wildly in biomedical applications [1]. *Lactococcus lactis* is a Gram positive, and it is used widely in industry as a food preserver and in fermentation as well as other biological activity. This bacterial strain is interestingly used in almost modern biotechnological applications [2]. It is used by a lot of people in industry for production and fermented dairy products. This bacterial strain could be used in extensive research like metabolic pathway to increase its efficiency for dairy production [3]. Recently, many studies are demonstrated the important role of this bacteria in biomedical applications such as oral vaccine, production of foreign protein , and in genetic engineering and metabolic pathway [4]. *;Lactococcuslactis* have come could used in economy in industry as well as food preservatives, and widely used in medical field [5]. The role of Zinc oxide nanoparticles in medical applications have been demonstrated by several studies. Resent study provided ZnO nanoparticles as non-toxic agent to mammalian and human cells, other study refer to used these nanoparticles as antibacterial agents, and noxious to microorganisms. In addition to a good biocompatibility to human cells [6]. There are many methods are used to synthesis of ZnO nanoparticles such as chemical, physical, and biological methods. The

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current study described a simple and eco-friendly way for production of zinc oxide nanoparticles using Iraqi *L. lactis*ssp.*lactis*isolate and evaluation of its antibacterial activity and Anti virulence factors against pathogenic bacteria isolated from skin infections.

MATERIALS AND METHOD

Microorganisms

Lactococcus lactis* ssp. *lactis

Lactococcus lactis ssp.*lactis* was isolated from fish intestine. Bacterial isolate was identified using many techniques such as cultural methods, and microscopical as well as chemicals method according to the protocol describe by Liu *et al.*(2014) [3] then identified through Vitek2 system.

Pathogenic Bacteria

Eight isolates of pathogenic bacteria isolated from skin infections included two isolates for each of *Pseudomonas aeruginosa*, *Acinetobacter baumanii*, *Klebsiella pneumonia* and *Staphylococcus aureus* were selected as virulence factors producer isolates. These isolates were identified throughout many techniques such as cultural methods, and microscopical as well as chemicals method according to Forbes (2007) [7] and Vitek2 system.

Detection of virulence factors:

Urease production

Urea agar is used to determine the ability of the pathogenic bacterial isolates to produce urease enzyme pathogenic. After incubation at 37° C for 24 h the change of color from yellow to pink indicated positive result [8] .

Hemolysin production

This test is used to detect production of hemolysin enzyme. Blood agar cultured with tested bacteria ,then was incubated at 37°C for 24 h, a hemolysis around the colony indicated positive result [9].

Pyocyanin production

Pseudomonas aeruginosa isolates were cultured in nutrient broth and incubated at 37C° for 24 h and observed for color change, by visually observing culture supernatants. So, the pyocyanin production was performed [10].

Biofilm formation of bacteria

Bacterial isolates were screened for their ability to biofilm formation using Microtiter plate method according to the procedure described by Mathur *et al*.(2006) [11]**.** 96 flat bottom well microtiter plate were filled with one hundred eighty µl of brain heart infusion broth with 4% ,sucrose then inoculated with 20µl of diluted bacterial suspensions. Control wells contained two hundred µl of media which is BHI broth with two % of sucrose, then the samples were sealed with parafilm then incubated at 37°C for 24 h, the rest of bacterial cells were discarded by three times washing with PBS (pH 7.2), drying at room temperature for 15 min, then 200 µl of crystal violet (0.1%) was added to the wells ;for 20 min. After removing the crystal violet solution, wells were washed three times with PBS (pH 7.2) to remove unbound dye, leave the plats at room temperature to dry, then added 200µl of 95% ethanol. After that read the absorbance at 630 nm by ELISA reader [12]. The O.D value for control well was deducted from all the test O.D value.

Biosynthesis of ZnO Nanoparticles

A pure culture of *L.lactis* ssp.*lactis* (9×10^8 CFU/ml) was used for biosynthesis of ZnO particles using sterile flask contains (MRS) broth culture media , then incubated at 30 °C for 24h. After this time the pH of the MRS culture media was adjusted to 6 by 1 M NaOH to stope transformation process. Zinc Chloride ($ZnCl_{2)}$ was used as analytical reagent grade during for preparation of 0.25 Moller strength solution at room temperature. After that, the prepared solution was added to flask containing culture media and the mixture is heated using water bath bath up to 80°C for 5-10 min [13]. The presence of white precipitate at the bottom of flask is refer to the transformation process then, the flasks was discarded from water bath, incubated at 37 °C for 12 h [14.] The final product was filtered and DW was added to ZnO nanoparticles.

Antibacterial activity of synthesized ZnO nanoparticles

The antibacterial activity of the synthesized ZnO nanoparticles by *L.lactis* ssp.*lactis* was measured via determine the, minimum inhibitory/ concentration (MIC) using micro dilution technique in the culture broth media.

Effect of biosynthesized ZnO nanoparticles on bacterial virulence factorsproduction.

Effect on urease production

The effect of ZnO nanoparticles biosynthesized by probiotics bacteria *L.lactis* ssp.*lactis* against urease production by bacterial isolates from skin infections were studied. Briefly, 0.1 ml of sub MIC ZnO nanoparticles was added on urea agar, then left at room temperature to dry after that the samples were inoculated with bacterial isolates and incubated for 24 h at 37 ^{o}C, the ability of bacterial strains to urease production was noted by formed of pink colonies whereas urease non-producers remained yellow in color [15].

Effect on hemolysin production

The effect of ZnO nanoparticles biosynthesized by probiotics bacteria *L.lactis* ssp.*lactis* against hemolysin production of bacterial isolates from skin infections were studied by using of blood agar method as described by (Bajelan, 2014) [15].

Effect on pyocyanin production by *Pseudomonas aeruginosa*

The effect of ZnO nanoparticles biosynthesized by probiotics bacteria *L.lactis* ssp.*lactis* against pyocyanin production of *P.aeruginosa* isolates from skin infections. Overnight culture of *P.aeruginosa* isolates werediluted1:100 in nutrient broth and then treated with subMIC of biosynthesized ZnO nanoparticles(1 :1) (ZnO nanoparticles: cultures),control included culture broth only . After growth for 16 h, culture supernatants were collected by centrifugation at 6000 rpm for 15 min, then transferred into cuvettes and photographed [16].

Effect on biofilm formation

The antibiofilm activity of biosynthesized ZnO nanoparticles against bacterial isolates from skin infections has been done using procedure used by Ali (2012).Each of bacterial suspensions in brain heartinfusion broth with 2% sucrose (100 **µl**) was added to 96- well flat-bottomed microtiter plate together with (100 **µl**) subMIC of ZnO nanoparticles. The control group wells contained 180 **µl** of brain heart infusion broth with 2% sucrose and 20 **µl** of bacterial suspensions, The covered microtiter plate was sealed with Parafilm during incubation at 37^{o}C for 24 h. The suspended bacterial strains were discarded by washing the plates more than three times with PBS(pH 7.2). After that leave the samples to dry at room temperature, then two hundred **µl** of crystal violet stain (0.1%) was added to the samples for 25 min. The stained attached bacterial cells were rinsed using PBS (pH 7.2) three times, then left the samples to dry at room temperature then extracted twice with 200 **µl** of 95% ethanol and the absorbance of each well was measured at 630 nm using ELISA Reader. The inhibition of biofilm formation for each pathogenic bacteria was measured as equation used by (Qayyum and Khan, 2016)

$$\text{Inhibition of biofilm formation \%} = \times 100$$

Antibiofilm assay measures the % reduction of bacterial biofilm related to the control wells, which were set at 100% to indicate the absence of ZnO nanoparticles.

RESULTS AND DISCUSSION

Characterization of synthesized ZnO Nanoparticles

Atomic Force Microscope (AFM), is on of important test which is used to view the nanomaterials both in surface and three Dimensional view , our results found that the average size of ZnO nanoparticles between (80-89) nm. The structure and lattice parameters of ZnO nanostructure were studied by X-ray diffraction. This technique gives an indication about the grain size, formation material type, strain and dislocation density. XRD pattern of ZnO nanoparticles biosynthesized by probiotic bacteria *L.lactis* ssp.*lactis* as show in figure (1A) Mostly the XRD peak were observed between (30^{o}-40^{o}). Fourier transformation-Infrared spectroscopic results give information about phase composition and the way in which oxygen is bound to metal ions. The following figures show the FTIR spectra for ZnO nanoparticles synthesized by probiotic bacteria *L.lactis* ssp.*lactis* (Figure 1B) shows that the absorption peak is around (400–800) cm^{-1} broken spectra which is related to the zinc oxide powder nanoparticles prepared. The presence of a broad absorption peak in FTIR indicates the synthesis of ZnO nanoparticles of varying sizes. The energy-dispersive X-ray analysis (EDX) spectra of the ZnO nanoparticle powder synthesized by probiotic bacteria *L.lactis* ssp.*lactis* which confirm that all the films contain the elements (Zn, O) (Figure 2A, B). The components of the growth media which are used in bacterial culture, therefore; play an important role in the production process of metallic and/or oxide nanoparticles

which is done in the current study. Energy- yielding material – suitable carbohydrate (which responsible of the rH_2 control), the ionic status of the medium pH and overall oxidation-reduction potential (Eh) of the culture medium, all these factors cumulatively negotiate the synthesis of ZnO nanoparticles in the presence of *Lactobacillus* strain. Previous studies on biosynthesis of silver nanoparticles using fungal cell-free filtrate also showed the presence of proteins on the surface of individual nanoparticles which conferred their stability[16].

Antibacterial activity of synthesized ZnO nanoparticles

The antibacterial activity of ZnO-NPS isolated from *L.lactis* ssp.*lactis* was determined by measuring the growth obtained for some bacteria causing skin infection. From those results, the MIC for each bacteria was determined,. Results showed that the MIC of ZnO nanoparticles synthesized by *L.lactis* ssp.*lactis* isolate was effective against all the tested pathogenic bacteria ,the MIC ranged between (25 -100) mg/ml.The best effect of ZnO nanoparticles was effective against *A.baumannii* and *S.aureus* found to be 25mg/ml but the lowest effect has been recorded on *P.aeruginosa* (50 -100mg/ml).

Effect of biosynthesized ZnO nanoparticles on bacterial virulence factors

The present study has made an attempt to find out the effect of bioynthesized ZnO nanoparticles by probiotic bacteria *L.lactis* ssp.*lactis* on urease production by pathogenic bacteria causing skin infection. Results showed that the biosynthesized ZnO nanoparticles had effect on urease production against isolates of *S.aureus* ,*P.aeruginosa* and *A.baumanii* while do not effect against the isolates *K.pneumoniae* (K6) and *P.aeruginosa* (p9) (Table 1). One of the most enzyme inhibitors are heavy metal ions which controls rate of urea hydrolysis. These chemical materials could be damage of enzyme structure results in loss of their function. The combination between copper (II) and zinc (II) play an important role as inhibitors of jack bean urease (Wang *et al*., 2017). The results of present study has been demonstrated that the biosynthesized ZnO nanoparticles using *L.lactis* ssp.*lactis* showed antibacterial activity against all bacterial strains which produce hemolysin enzyme except two bacterial isolates of *K.pneumoniae* and *P. aeruginosa* (p6) (Table 1). This study is the first to examine the inhibitory effects of ZnO nanoparticles biosynthesized by *L. Lactis ssp.lactis* against pyocyanin production of (*P.aeruginosa* 6, *P.aeruginosa* 9) isolated from skin infection. pyocyanin inhibition by the plain Solid lipid nanoparticles (SLNs) was not due to killing of the bacteria, an effect that is often associated with nanoparticles.

Effect on biofilm formation

Zinc Oxide nanoparticles synthesized by probiotic bacteria *L. lactis ssp. lactis* were studied to inhibit biofilm formation by bacterial isolates from skin infection. Results showed that biosynthesized ZnO nanoparticles recorded maximum biofilm inhibition against gram negative bacteria after incubated for 72 hreached to (59.46, 62.18)% against (*A.baumanii* A1 and *A. baumanii* A6) respectively and (51.79, 41.71) % against gram positive bacteria (*S. aureus*3 ,*S. aureus* 9) respectively (Table 2).

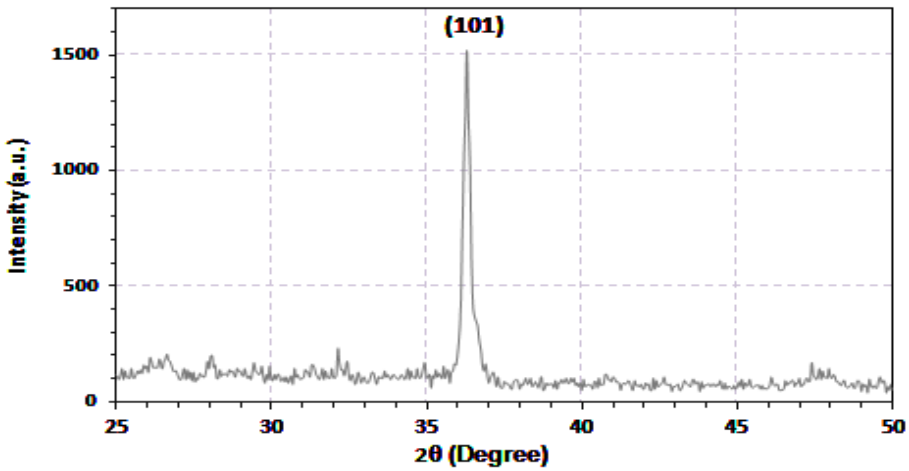

Figure 1. XRD pattern of ZnO nanoparticles synthesized by probiotic *Lactococcus lactis* **ssp**.*lactis*

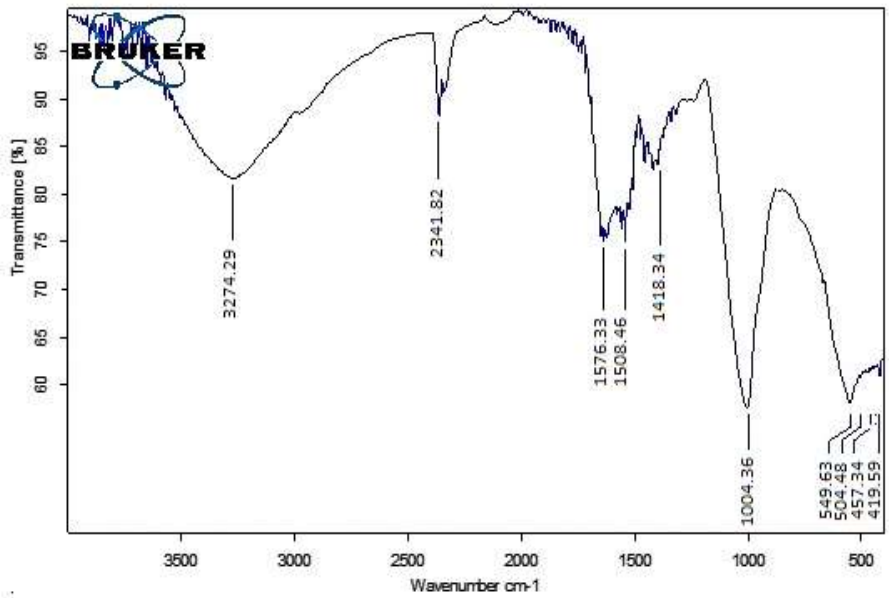

Figure 2. FTIR results of ZnO nanoparticles synthesized by probiotic bacteria *Lactococcus lactis* ssp.*lactis*

Table 1. Effect of (ZnO NPs) synthesized by *L.lactis* ssp.*lactis* on hemolysin and Urease production of bacterial isolates from skin infections

Bacterial isolates	hemolysin Before treatment	hemolysin After treatment	Urease Before treatment	Urease After treatment
P.aeruginosa (P6)	+	+	+	_
P.aeruginosa (P9)	+	-	+	+
K.pneumoniae(*K5*)	+	+	+	_
K.pneumoniae(*K6*)	+	+	+	+
A.baumanii (*A1*)	+	-	+	_
A.baumanii(*A6*)	+	-	+	_
S .aureus (*S3*)	+	-	+	_
S.aureus (*S9*)	+	-	+	_

Table 2. Antibiofilm effect of (ZnO NPs) synthesized by *Lactococcus lactis* ssp.*lactis* against bacterial isolates from skin infections

Bacterial isolates	Biofilm inhibition %		
	Incubation time(hour)		
	24	48	72
P.aeruginosa(P6)	-16.67	18.75	46.73
P.aeruginosa(P9)	-10.45	17.22	26.53
K.pneumoniae(*K5*)	2.564	12.4	59.46
K.pneumoniae(*K6*)	20.71	22.76	62.18
A.baumanii(*A1*)	9.375	13.56	38.27
A.baumanii(*A6*)	11.71	21.24	32.14
S .aureus(*S3*)	26.4	46.31	51.79
S.aureus(*S9*)	13.16	24.79	41.71

CONCLUSION

In conclusion, in this study a save and non-expensive biological, and ecofriendly method was used for production of zinc oxide nanoparticles by using *Lactococcus lactis* ssp.*lactis*. Biosynthesized ZnO nanoparticles had antibacterial and anti-virulence factors against skin infections causative bacteria.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Science, Mustansiryah University, Baghdad city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Calculation of Optimum time Exposure of Ultraviolet Radiation for Different Seasons at Baghdad City

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ABSTRACT

Aims this study is focused to calculate exposure times which cause to skin damage (one minimum erythemal dose) and the optimal time for exposure to sunlight that is needed to receive adequate UV for vitamin D production, without inducing erythema at Baghdad city. In this study calculated the annual and seasonal optimal time for exposure of Ultraviolet radiation and Maximum exposure time for causes skin burns in Baghdad depending on the Fitzberk classification assuming normal ozone conditions throughout the year by using Ultraviolet radiation data received from French site for Solar radiation data(SODA) in the period 1/1/2005 to 31/12/2017. The greatest time for exposure to solar radiation to create vitamin D without skin burns was 16 min in winter, 6 min in spring, 5 min in summer and 9 min in autumn, While the greatest exposure time to solar radiation that causes burns is 80 min in winter, 32 min in spring, 22 min in summer, and 46min in autumn. It was find the number of days per UV Index level was found in one year (2015) were low level 8 days, Medium level 74 days, High level 68 days, Very High level 93 days.

Keywords: *Ultraviolet Radiation, Ozone, pigmentary changes, Skin Cancer, Skin Burns, Vitamin D, Solar radiation.*

INTRODUCTION

The Ultraviolet radiation waveband is traditionally included in the nonionizing radiation although the UV band has enough energy to break the bond of macromolecules [1,2]. It is divided into three bands although the exact wavelength at which the divisions are made differ in accordance with different disciplines. The Second International Congress on Light in Copenhagen in 1932 defined three regions: UVA 400-315nm, UVB 315-280nm, UVC 280-100nm. However, in photobiology the boundaries for these regions are slightly different and associated with the biological effects: UVA 400-320nm, UVB 320-290nm, and UVC 290-200nm [3]. Solar Ultraviolet radiation is responsible of a variety of different effects on biological systems prolonged human exposure to solar UV radiation may result in acute and chronic health effects on skin, eyes and immune system. Sunburn and tanning are the best known acute response to excessive UV radiation exposure [1]; chronic and lifetime sun exposure induce degenerative changes in cells, fibrous tissue and blood vessels and lead to premature skin ageing. Ultraviolet radiation likely to cause inflammatory reactions of the eye, such as keratitis and It can cause cutaneous malignant melanoma, non-melanoma skin cancers are squamous cell carcinomas are basal cell carcinomas in fair-skinned populations the most common [4]. The effect of excessive Ultraviolet radiation exposure is erythema, the familiar skin reddening termed sunburn, estimated at 24 h after exposure, It is considered a large dose. The erythemal response depends not only on the UV dose but also on skin type. Sensitivity to sunburn is usually determined by the minimal erythema dose (MED) is the minimum dose that will make a just perceptible erythema 8-24 hours after irradiation [5]. While UV in solar radiation is needed to synthesize previtamin D in the epidermis. UV radiation very important in maintaining our health, especially in the protection of diseases caused by

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deficiencies in serum vitamin D [6,7]. Therefore, it is important to know the convenient UV exposure time to obtain the amount of vitamin D [8,10] .The ultraviolet Index adopted worldwide as a standard scale to UV radiation intensity at the Earth's surface [11] and serves to inform the public about the intensity of the Sun's UV radiation and the adequate sun protection actions recommended to avoid excessive exposure to UV radiation [12,13] The erythemal action spectrum is a weighting function which simulates the damage process occurring in the epidermis. It is used to determine the UV index [14-16]. The UV index is calculated dividing a summer erythemal dose rates at mid-day under cloud free conditions, which becomes a scale of 1 to 11 (or more) indicating the potential sun burning of the solar radiation[17].

becomes a scale of 1 to 11 (or more) indicating the potential sun burning of the solar radiation[17].

$$\mathrm{UVI} = \frac{1}{25\mathrm{mWm}^{-2}} \int_{280\mathrm{nm}}^{400\ \mathrm{nm}} \mathrm{I}(\lambda)\mathrm{E}_{\lambda}\, \mathrm{d}\lambda \qquad \ldots\ldots\ldots\ldots 1$$

$I(\lambda)$ is the solar irradiance at the surface ($mW/m^2/nm$) and E_λ is the erythemal action spectrum:

$$\begin{aligned} E_\lambda &= 1 && \text{for} \quad \lambda \le 298\ \mathrm{nm} \\ E_\lambda &= 10^{0.094(298-\lambda/\mathrm{nm})} && \text{for} \quad 298\ \mathrm{nm} < \lambda \le 328\ \mathrm{nm} \\ E_\lambda &= 10^{0.015(139-\lambda/\mathrm{nm})} && \text{for} \quad 328\ \mathrm{nm} < \lambda \le 400\ \mathrm{nm} \\ E_\lambda &= 0 && \text{for} \quad 400\ \mathrm{nm} < \lambda \end{aligned}$$

……2

The time needed (t_E in minutes) to induce skin damage was calculated as follows:[17]

$$t_E = \frac{4000}{60} \frac{\mathrm{MEDF}\,.\mathrm{SPF}}{\mathrm{UVI}} \ldots\ldots\ldots\ldots\ldots 3$$

Where: 4000/60 accounts for the conversions from UVEry to UVI and seconds to minutes; UVI is the UV Index; MEDF (Minimum Erythemal Dose Factor) is a factor to take into account the differences in skin color and SPF is the sun protection according to the Fitzpatrick skin classification (Table 1) . The optimal time for exposure to sunlight that is needed to receive adequate UV for vitamin D production, but without inducing erythema, depends strongly on season and latitude. The exposure time for sufficient vitamin D was calculated taking into account the area of exposed skin expressed as percentage of total body area (A)[19]:

$$t_D = 8\,. \frac{\mathrm{MEDF.SPF}}{\mathrm{UVI.R.A}} \qquad \ldots\ldots\ldots\ldots\ldots 4$$

Where: R is the ratio of UV_{VitD} /UV_{Ery} ; A is the uncovered body area expressed in %

RESULTS AND DISCUSSION

For determining UV radiation exposure time for vitamin D Synthesis in the Skin without risk to health. Assuming body area exposed and no sunscreens (face and the backs of both hands) about A=0.27.The number of days of the levels of the ultraviolet radiation index was determined and shown in Table (2).

The number of days for Extreme high and very high levels for UVI constitute about 59% Where the level of Extreme(34%) and very high(25%) for (Mar,Apr,May,Jun,Jul,Aug and Sep). Time needed for effective exposure for vitamin D synthesis has been calculated in Figure (1a) shows optimal times of exposure for skin types (II,III,IV), and these skin types have been selected because they are the most available in Baghdad. The time needed to induce skin damage for skin type II needs 14 minutes in summer While the skin type IV need of about 35 minutes. In winter it takes more time for damage, Where the skin type 11 needs 35 minutes and the type of skin in need of 88 minutes as shown in Fig (1a). In the summer skin type II(represents

light skin) needs 4 minutes to generate vitamin D While the skin type IV(represents dark skin) need of about 10 minutes to be generated vitamin D due to high levels of ultraviolet radiation as shown in Fig (1b) .In winter, it takes more time for vitamin D to be produced Where the skin type II needs 11 minutes and the skin type IV need of 22 minutes to generate vitamin D.

Table 1. Skin type classifications according to the Fitzpatrick scale [18].

Skin type	Description	SED
I	Celtic (always burn)	2 - 3
II	Pale (burns easily)	2.5 – 3
III	Caucasian(may burn)	3 – 5
IV	Mediterranean (burns rarely)	4.5 – 6
V	S. American (rarely burns)	6 – 20
VI	Negroid (rarely burns)	6 - 20

Table 2. Number of days for levels of UVI

UV Index	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Low1,2	2	-	-	-	-	-	-	-	-	1	4	1
Medium3,4,5	18	6	-	1	-	-	-	-	1	7	12	29
High6,7	11	17	6	-	3	-	-	-	1	16	14	-
Very High8,9,10	-	5	25	11	6	2		9	28	7	-	-
Extreme11+	-	-	6	18	22	28	31	22	-		-	-

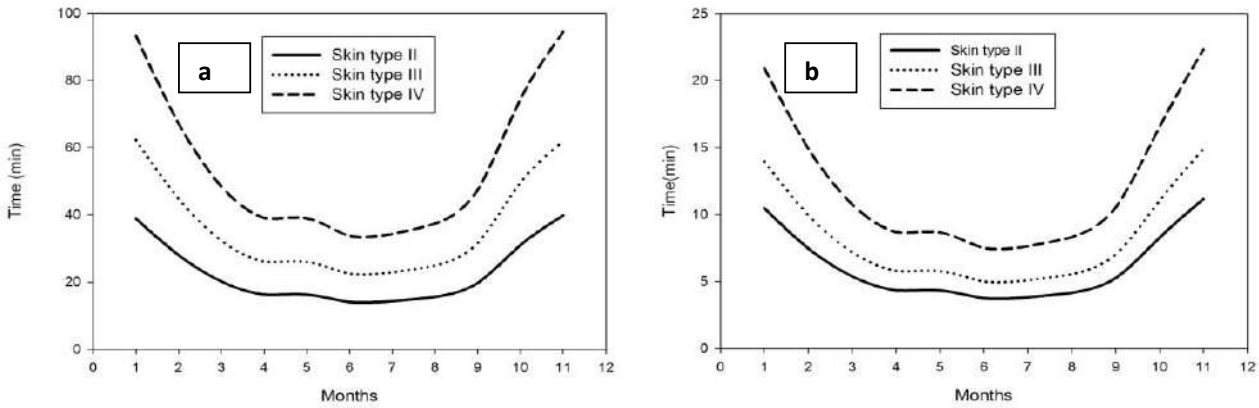

Figure 1. (a) the time taken to receive an erythemal for different skin types.(b) shows the Optimum time for ultraviolet exposure to generate vitamin D for different skin type.

CONCLUSION

The number of days of levels of ultraviolet (UV) index was 127 days and about 34% from the days of the year. Therefore, UV protection should be applied regardless of the color of skin, since this high ratio is distributed over five months, from March to September .This requires the use of means and methods of protection from solar radiation during these months, especially during the hours of 11 am and 14 pm in the summer, sufficient vitamin D can be produced from a few minutes of sun exposure to the face and hands. But the exposure time should be limited to less than approximately 10 minutes to avoid sunburn**.** The area of skin exposed to solar radiation (A) must be more than 27% as most people expose the face and hands only, especially for women for social reasons, which leads to a decrease in the generation of vitamin D and this vitamin is very important to the absorption of calcium in the body. It is preferable to expose a larger area, such as the shoulders and some parts of the arms or legs, rather than just the face and hands.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Ministry of Science & Technology, Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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Cell–Cell Communication (Quroum Sensing) in Gram-Negative and Gram-Positive Bacteria: A Review

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ABSTRACT

Quorum sensing indicates to the capability of a bacterium to sense information from other members in the population when they compass a critical concentration and connect with them. The mode used for this intercellular connection is depend on small, self-generated signal molecules called as autoinducers. Quorum sensing is reflection to endure pathogenic bacteria mechanism to reduce host immune responses by retardant the forming of tissue-destroying virulence factors until adequate bacteria have accumulated and are destined to crush host defense mechanisms and set infection. Among these pathogenic bacteria, Gram negative bacteria such as *Pseudomonas aeruginosa*, *Vibrio* spp*., and Escherichia coli as well as Gram positive bacteria; S. aureus* and *Clostridium perfringens* are probably the best understood in terms of the virulence factors regulated by the Quorum sensing that plays a role in the pathogenicity. In conclusion bacteria do not live separated, but rather they communicate using varied chemical languages.

Keywords: *Quorum sensing, Gram positive bacteria, Gram negative bacteria, Virulence factors.*

INTRODUCTION

Bacterial cell-cell communication systems also called quorum sensing (QS) is a mechanism that regulates gene expression according to cellular density that are based on the release of signal molecules known as autoinducers(AIs) ,so called because they can act on the same cell that releases them, and are able to trigger gene expression throughout the population, causing a global response [1]. The concentration of the autoinducer is decisive in starting the QS, the higher the population density (greater number of individuals), the higher the autoinducer's concentration in the external environment that stimulating the changes in their cell numbers and collectively alter gene expression [2]. QS controls genes that direct activities that are beneficial when performed by groups of bacteria acting in synchrony. Different forms of QS have been discovered in various bacterial genera. The difference between them lies in the type of autoinducer molecule used and the global response triggered in the bacteria.

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Quorum sensing History

Bacterial activity involving quorum sensing was first observed in the mid-1960s by the microbiologist Alexander Tomasz in his studies of the ability *Streptococcus pneumoniae* to take up free DNA from its environment. In 1970, the first QS in bacteria *Vibrio fischeri* were observed. The researchers found that the Gram-negative bacterium that lives in a free-living in the seas and oceans. The low number does not produce luciferase but when the luminous organs of fish or marine bacteria holes cephalopods (Euprymna scolopes) into the holes where the organs of reproduction is and then increase the number of bacteria, QS active and causes the activation of luciferase gene and luminance phenomenon occurs [3-5].

Quorum sensing in Gram positive bacteria and gram negative bacteria

Gram-positive and Gram-negative bacteria use different types of QS systems. AI molecules produced by Gram-negative bacteria diffuse passively into and out of cells, whereas AIs synthesized by Gram-positive bacteria

are actively transported [6]. Gram-positive bacteria use peptides, called autoinducing peptides (AIPs), as signaling molecules. Once produced in the cell, AIPs are processed and secreted. When the extracellular concentration of the AIP is high, which occurs at HCD, it binds to a cognate membrane-bound two-component histidine kinase receptor. Usually, binding activates the receptor's kinase activity, it autophosphorylates, and passes phosphate to a cognate cytoplasmic response regulator. The phosphorylated response regulator activates transcription of the genes in the QS regulon. In some cases of Gram-positive bacterial QS, AIPs are transported back into the cell cytoplasm where they interact with transcription factors to modulate the transcription factor's activity and, in turn, modulate gene expression changes [3].

QS Control of virulence factors in Gram positive bacteria

In Gram-positive bacteria such as gram-negative bacteria, QS has role triggering of infection, antibiotic production, biofilm, and so is the role and structure of QS molecules in Gram-positive bacteria differ from gram-negative bacteria [6].In Gram positive bacteria more molecules of peptide Octa or Hepta who called pheromone involved in transmitting messages. These molecules that are hydrophobic low molecular weight (5×10^{-11}m) and at least two molecules per cell of these peptides with biological activity there. Receptor agonist study suggests that these molecules messaging system similar to cytokine signaling in eukaryotic [6,7]. QS Controls virulence factor production in various Gram-positive human pathogens including *S. aureus*, *Listeria monocytogenes*, *Bacillus cereus*, *Enterococcus faecalis*, and *Clostridium perfringens* [3,8,9] .

Staphylococcus aureus Quorum Sensing

Staphylococcus aureus is a gram-positive, round-shaped bacterium that is a member of the Firmicutes, and it is found among the normal human skin flora. If the epithelial barrier is compromised, *S. aureus* can cause minor skin infections. These infections can lead to pneumonia, bacteremia, and sepsis [10]. Its ability to cause disease depends on expression of an array of adhesion molecules, toxins, and compounds that affect the immune system. QS Regulates expression of genes encoding these virulence factors [3].The quorum sensing system in *S.aureus* occurs through the accessory gene regulator (*agr*) [11]. It is a complex molecular mechanism and though the pathway is elucidated, the response of QS itself is not well understood. *Agr* functions to increase the expression of certain virulence factors secreted by *S. aureus* and decrease certain cell surface proteins [11]. There is evidence that *agr* contributes to *S. aureus* pathogenicity in several infection types, including subcutaneous abscesses, endocarditis, and arthritis. On a molecular level, the *agr* locus contains promoters P2 and P3 that encodes transcripts for RNAII and RNAIII, respectively [11]. The P2 and P3 operons code for different proteins that have individual roles in *agr*-sensing. P2 operon encodes the RNAII transcript that produces gene products *agrB*, *agr D*, *agrC*, and *agrA* [11]. These four products comprise the actual signaling system. The P3 operon encodes the RNAIII transcript that produces only one gene product—a toxin called delta-hemolysin—but that increases transcription of several virulence factors. However, it has been noted that the *agr* system is not necessary for the expression of virulence factors like toxins. *AgrD* and *AgrB* work together to produce an auto-inducing peptide (AIP). *AgrD* encodes for pro-AIP and transmembrane protein *AgrB* processes the pro-AIP to AIP, transporting it to the external cellular space. AIP will continue to accumulate in the external environment beyond the cell membrane, eventually binding to *AgrC*, a kinase embedded within the membrane. The *AgrC* kinase phosphorylates regulator *AgrA*, which then is responsible for the autoinduction of the *agr* locus by binding to the P2 and P3 promoters and initiating the cycle again. The *agr*-sensing system is a circuit that is auto-activating [11,12].

Clostridium perifringes Quorum Sensing

Clostridium perfringens is a Gram-positive, spore-forming, anaerobic bacterium that is widely distributed in soil, feces, and foods as well as the normal intestinal microbiota of both humans and animals [13]. *C. perfringens* produces various exotoxins and enzymes that cause food poisoning and gas gangrene. The genes involved in virulence are regulated by the *agr*-like quorum sensing (QS) system, which consists of a QS signal synthesis system and a *VirSR* two-component regulatory system (*VirSR* TCS) which is a global regulatory system composed of signal sensor kinase (*VirS*) and response regulator(*VirR*) [14]. Both similarities and differences exist between the *Agr*-like QS system of *C. perfringens* and the well-characterized, paradigm *Agr* system of *S. aureus* [12,14,15]. For example,

the *C. perfringens Agr*-like QS system includes an operon encoding *AgrD* and *AgrB*, where *AgrD* is the precursor peptide for the autoinducing peptide (AIP) that mediates *Agr* QS signaling and *AgrB* is the integral membrane endopeptidase that is involved in processing *AgrD* to the active AIP. However, *C. perfringens* lacks the *AgrA/AgrC* two-component system that responds to the AIP in *S. aureus* [15-17].

QS Control of virulence factors in Gram negative bacteria

The vast majority of gram-negative quorum-sensing systems that have been studied thus far utilize *N*-acyl homoserine lactones (AHL) as signaling molecules. When in high enough concentration, these molecules can bind to and activate a transcriptional activator, or R protein, which in turn induces expression of target genes [21].

LuxI/LuxR Quorum Sensing

Gram-negative bacterial systems employ the autoinducer Homoserine Lactones synthesizedby a *LuxI* homologue and a *LuxR* homologue. The *LuxR* homologue encodes a transcriptional activator protein which detects the cognate HSL inducing the appropriate phenotype. It has been established that such cell dependent phenomenon is exhibited by over 30 species of Gram-negative bacteria. Though *LuxI*/*LuxR* systems are used by a variety of bacteria for quorum sensing, there exists a layer of complexity in the *LuxI*/*LuxR* systems [3]. *LuxI*/*LuxR* homologs have been identified in more than 100 Gram-negative bacterial species [21]. AHLs produced by different bacteria possess different length side chains and side-chain decorations. Acyl chains ranging from C4 to C18 have been identified with modifications such as carbonyl and hydroxy moieties at the C3 position [22,23].

***Vibrio cholerae* Quorum sensing**

Vibrio cholerae, the causative agent of the diarrheal disease cholera, exists primarily in marine environments, and infection of humans usually occurs through ingestion of contaminated water [26]. After traversing the stomach, *V. cholerae* expresses an array of virulence factors that enable colonization of the host intestinal epithelium. The major colonization factor, toxin coregulated pilus, promotes adherence to the intestinal lining, and the subsequent secretion of cholera toxin leads to severe diarrhea and release of the bacterium into the environment [27]. Critical to its infection cycle is *V. cholerae*'s ability to alternate between expression of virulence traits essential for survival inside the host and expression of traits such as biofilm formation that are necessary for survival in its ex vivo marine environment [28]. Quorum sensing in *V. cholerae* controls the expression of virulence factors including cholera toxin and biofilm formation. *V. cholerae* is regulated by two parallel QS pathways, the CAI-1 pathway, specific to *V. cholerae*, and the AI-2 pathway which is relayed between multiple species of bacteria [29,30]. The use of two external signaling molecules allows the bacteria to accurately monitor the composition and developmental stages of its surrounding community and vary gene expression accordingly.

***Pseudomonas aeruginosa* Quorum Sensing**

Pseudomonas aeruginosa is a Gram-negative organism that is commonly found in soil and water. Although *P. aeruginosa* can survive under multiple harsh conditions, it is an opportunistic pathogen and is only able to infect hosts with defective immune system function, such as that observed in individuals with cystic fibrosis, burns, and HIV. To facilitate the establishment of infection, *P. aeruginosa* produces an impressive array of both cell-associated and extracellular virulence factors. Several of these virulence factors have been demonstrated to be regulated by (QS) [3]. A second QS system in *P. aeruginosa* consists of the *RhlI* and *RhlR* proteins. The *RhlI* synthase produces the AHL *N*-butyryl-L-homoserine lactone (C_4-HSL), and *RhlR* is the transcriptional regulator [3].

***Escherichia coli* Quorum sensing**

Escherichia coli also known as *E. coli* is a Gram-negative, facultative anaerobic, rod-shaped, coliform bacterium of the genus *Escherichia* that is commonly found in the environment, foods, and intestines of people and animals. *E. coli* are a large and diverse group of bacteria. Although most strains of *E. coli* are harmless, others can make you sick. Some kinds of *E. coli* can cause diarrhea, while others cause urinary tract infections, respiratory illness and pneumonia, and other illnesses. In the bacterium *Escherichia coli* , cell division may be partially regulated by AI-2-mediated quorum sensing. This species uses AI-2, which is produced and processed by the *lsr* operon. Part of it encodes an ABC transporter, which imports AI-2 into the cells during the early stationary (latent) phase of growth. AI-2 is

then phosphorylated by the *LsrK* kinase, and the newly produced phospho-AI-2 can be either internalized or used to suppress *LsrR*, a repressor of the *lsr* operon (thereby activating the operon). Transcription of the *lsr* operon is also thought to be inhibited by dihydroxyacetone phosphate (DHAP) through its competitive binding to *LsrR*. Glyceraldehyde 3-phosphate has also been shown to inhibit the *lsr* operon through cAMP-CAPK-mediated inhibition. This explains why, when grown with glucose, *E. coli* will lose the ability to internalize AI-2 (because of catabolite repression). When grown normally, AI-2 presence is transient.

CONCLUSION

The ability to assortment behavior in a cell-density-dependent style has several apparent benefits. In the state of pathogenic microorganisms, the regulation of virulence determinants during the infection process is thought to play an important role in pathogenicity. Evading host defenses is a major aim of pathogens, and Quorum sensing provides these bacteria the appropriate time to express the immune evading machinery. Using Quorum sensing, bacteria can collect a high cell density before virulence determinants are expressed, and in doing so, the bacteria are capable to make a planned attack and produce vast virulence factors to smash the host defenses. In the future, it will be remarkable to see whether additional human pathogens utilize Quorum sensing as portion of their pathogenic lifestyle and, if so, whether production of the signal molecules, AHL or otherwise, can be utilized to control infections.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Biology, College of Science, University of Al-Qadisiyah, Al-Diwaniyah, Iraq and all experiments were carried out in accordance with approved guidelines.

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Closed Loop System Synchronization of Quantum Dot Semiconductor Lasers with Optical Feedback

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ABSTRACT

In this work a systematic study on Close - Loop System occurring in the rout to chaos observing in integrated of quantum dot semiconductor lasers with optical feedback .The time delay of the feedback has been chosen in order to provide suitable condition for intermittent dynamics. The effect of long and short external cavity of QDSL on synchronization in a closed –loop system are studied under an enhancement factor of $(\alpha = 3.5)$ value by solving the set of 6-rate equation.

Keywords: *Close-loop system, Quantum dot, semiconductor laser, optical feedback, line width enhancement factor.*

INTRODUCTION

Control of Chaotic synchronization in different dynamical systems has more interest attracted with potential applications on private communication [1]. Synchronization phenomena in Quantum Dot (QD) semiconductor laser chaotic has a good Subject of interesting by sensitive with optical feedback, and discrete energy for materials and low linewidth enhancement factor. This has motivated many studies, with expected benefits including elimination of lasers [2]. Transmitter and Receiver systems have optical feedback loops and this configuration is called a closed-loop system. on other word, two time delay on receiver laser. When another Transmitter and Receiver systems, receiver system does not have a feedback loop, transmitter laser have time delay coupling with receiver laser ,this asymmetric system is called an open-loop system. Two above system must have output a chaotic signal [3].Very small semiconductor particles with (2-10 nm) are called Quantum Dots (QDs),by confined electron and holes in all spatial dimensions [4]. The idea of chaos synchronization between two nonlinear systems was proposed by (Pecora and Carroll), They used a Lorenz system with three variables for the demonstration [5]. Low threshold current density, high characteristic temperature and small linewidth enhancement factor (LEF) is the characteristic of quantum dot semiconductor laser (QDSL)[6]. Therefore, the synchronization scheme is called complete chaos synchronization and it is distinguished from generalized synchronization of chaotic oscillations [7]. quantum dot (QD) nano structures used on telecommunication applications due to the carrier confinement in three dimensions [9,8]. Optical feedback is the carrier dynamics to be affects the output of QD laser [10] also optical injection [11]. When used with optoelectronic feedback circuits, QDSLs are more sensitive to time delay changes than other SLs [12]. Two different origins of synchronization in nonlinear delay differential systems, complete and generalized chaos synchronization. When receiver outputs a synchronized wave form immediately after it receives the transmitter signal, therefore there is a time lag between the two outputs, this system called generalized synchronization. Another type of chaos synchronization accrue when time lag is less than the signal transmission between the transmitter and receiver systems [13].

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Rate equation of Quantum Dot Laser

In QD semiconductor devices, the carriers are first injected into a wetting layer before being captured into a dot at a capture rate that depends strongly on the dot population. The rate equations

method, includes a set of at least three coupled equations; carrier density (N), photon density(E) and the other for the occupation probability(ρ) . They are given in equations (1-3) shown below [14,15]. Thus, rate equations that commonly describe carrier dynamics of QD materials read [16]

$$\frac{dE_{(T,R)}}{dt} = E_{(T,R)}\left(-\frac{}{2t} + \frac{}{2}(2\rho_{(T,R)} - 1)\right) + \frac{}{2}E_{(T,R)}(t - \tau_{(T,R)}) + R_{sp} \quad (1)$$

$$\frac{(T,R)}{dt} = -t_n\ \rho_{(T,R)} - g_o(2\rho_{(T,R)} - 1)\left|E_{(T,R)}\right| + CN_{(T,R)}(1 - \rho_{(T,R)}) \quad (2)$$

$$\frac{dN_{(T,R)}}{dt} = J_{(T,R)} - \frac{N_{(T,R)}}{t} - 2n_d\ CN_{(T,R)}(1 - \ _{(T,R)}) \quad (3)$$

where $N_{(T,R)}$ is the carrier density in the well for transmitter and receiver lasers, $E_{(T,R)}$ is the complex amplitude of the electric field for transmitter and receiver lasers, $\rho_{(T,R)}$ is the occupation probability in a dot for transmitter and receiver lasers,; t_s is the photon lifetime; t_n and td are the carrier lifetime in the well and the dot, respectively; N_d is the two-dimensional density of dots; and $J_{(T,R)}$ is the pump. γ and τ describe the feedback level and delay time, where τ =2L/c is the round trip time of light within the external cavity (L) and c velocity of light[15] . C is Auger carrier capture rate [16]. In this work we analyze theoretically, closed -loop system consist of two type of synchronization as complete and general for transmitter and receiver quantum dot semiconductor lasers with optical feedback. Same two laser on linewidth enhancement factor (equal to 4), current, time delay, and different on time delay between two lasers τ_c .

RESULTS AND DISCUSSION

the account both photon density, occupation probability, carrier number and attractor using the fourth-order Runge-Kutta numerical method and Matlab. Photon density of (QDSL)as a function of time when $\alpha = 3.5$, $(\tau = 14.7ns)$, photon density reach to ($2.8*10^{20}$ m^{-2}) and reduced to a chaotic behavior at steady state. Not periodic behavior for transmitter and receiver of (QDSL)and attractor between photon density of receiver laser and transmitter laser is clearly not periodic with general synchronization time series for photon density of transmitter and receiver (QDSL) laser when $\alpha = 3.5$, $(\tau = 15ns)$, double quasiperiodic and chaotic quasiperiodic respectively. Attractor chaotic behavior double quasiperiodic and chaotic quasiperiodic respectively when $\alpha = 3.5$, $(\tau = 14.7ns)$, $(\tau = 15ns)$ respectively. For table (2) when time delay $(\tau_{T,R} = 19.5, 20, 26ps)$,irregular quasi periodic relation between photon density of quantum dot semiconductor lasers(transmitter and receiver), and quasi general synchronization.A different on time delay equal to (0.5 ps), after (6 ps) photon density is stable with periodic behavior ,and good general synchronization. For long external cavity length, when time delay $(\tau_{T,R} = 300, 310, 320, 350ps)$ for transmitter and receiver QD lasers. a chaotic behavior on all values time delay with no synchronization except when $(\tau_{T,R} = 350ps)$,we obtained good complete synchronization. that is good results for application communication

CONCLUSION

The effect of time delay on Quantum Dot Semiconductor lasers with Optical Feedback dynamics are studied in this search with one value of Linewidth enhancement factor (3.5), critical behaviour of chaotic when short external cavity and crisis general synchronization. long external cavity determine critical behaviour of chaotic and good complete synchronization at $(\tau_{T,R} = 350ps)$.

Table 1. Parameters used in the calculation for QDSEL.

Definition	Symbol	Value	Units
Photon life time	ts	3.4	ps
Carrier life time well	t_n	1	ns
Electronic charge	q	1.6×10^{-19}	C
Carrier life time dot	t_d	1	ns
Linewidth enhancement factor	α	2 , 4	-
Velocity of light	c	3×10^{8}	m/sec
Spontaneous recombination factor		3×10^{-5}	-
Group velocity		7.14×10^{9}	cm/s
Confinement factor	Γ	0.03	-
Photon decay rate		5×10^{11}	Sec^{-1}
Number of carrier at transparency		1.8×10^{18}	cm^{-3}
Effective gain factor	g_0	$0.414*10^{-16}$	
Density of Quantum Dot	N_d	$2*10^{14}$	cm^{-3}

Table 2. Time delay and stets of Synchronization.

Time delay (ps)	$\|E_T\|^2, \|E_R\|^2 \, with Time$	Type of synchronization
19.5	Double periodic	Quasi general synchronization
20	Chaos	No synchronization
26	periodic	General synchronization
300	Chaos	No synchronization
310	Chaos	No synchronization
320	Chaos	No synchronization
350	Chaos	Complete synchronization

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Ethical Clearance: All experimental protocols were approved under the Laser Physics Department, Science College for Women, Babylon University, Hilla, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Effectiveness of Tablets in Developing Teaching Skills at the University

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ABSTRACT

The study aimed to identify the effectiveness of tablets in the development of skills in the university teaching. The sample was selected in a descriptive way, from the University College of Imam al-Azam, and the number of the sample (23) teaching staff, trained and developed their teaching skills through tablets, was used to describe the phenomenon accurately and express it as a qualitative or quantitative expression and description of the devices tablet, display and identification of skills, a one-set experimental curriculum for the theme of the study, measuring the effectiveness of tablets in the development of skills, and used to collect data two tools: The first: The Test of tribal and post skills, of the type of choice of multiple and have been sure to believe The test and stability as well as the statistical analysis of its paragraphs, the second instrument of observation card and after legalization has been calculated its sincerity and consistency and applied to the sample. The statistical Packaging program for Social Sciences (SPSS) was used to conduct the appropriate statistical processes for research, including the equation: (kr-20), test (Wilcoxon) and test (v) for two mean-bound, and others.

***Keywords**: Efficiency, Tablets, Teaching Skills.*

INTRODUCTION

The educational field of the present era has witnessed a clear progress in the field of technology coincided with the knowledge explosion and transformed the world into a small village, so the educational and educational techniques developed, to achieve the educational goals effectively according to the Standards and educational foundations [1]. During the current decade, there has been a major shift in technology in the classroom. Students now a day live in a world surrounded by laptops and mobile devices, today's generation of students is living in an age that requires digital literacy skills (Literacy Skills) which assists them in searching for information, testing and evaluating data with their fingertips. So, integrating technology into the classroom is not just a popular obsession, but also becoming a need for today's Society [2-4]. In this sense, those interested in technological science and education have begun to devise ways to help both the teacher and the teaching staff in the planning, implementation and evaluation of attitudes. Educational, and from these means interactive whiteboard [5] which is a hand-held device. Therefore, it is imperative that the teaching staff be actively trained in technological concepts and skills, so that they can play their critical role and have sufficient skills to provide their lectures electronically and using tablets effectively. To save time and effort, and organize lectures in an interactive electronic way that can be displayed in a variety of ways and at multiple times through tablets that encourage self-learning as well, and collaborate in making the educational environment more effective and give students a greater opportunity to interact with lectures and motivate them to participate actively and others. The main objective is how to manage and use information and harness it to raise the learner's efficiency in the face of present and future problems, enable him to face the challenge of mystery and surprises, and increase his ability to adapt the environment and the surroundings he lives in [6]. According to the study [7]: Previous studies lacked education based on the use of smart cellular applications, mobile devices and tablets carried by many learners, which can become the best way to teach students

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to be better used [8]. The rapid development of educational technologies and software has become effective tools and devices that provide ample opportunities for the university teaching staff in particular, the teacher and the instructor in general, to develop their teaching and training skills, and to strengthen the educational and educational process with the educational developments that can be employed And the investment of tablets to benefit from them.

METHODOLOGY

Includes Review of some of the previous symposia, conferences and studies related to the subject and dimensions of the study and the current study variables where the independent variable represents: tablets, and the dependent variable: developing skills in the university teaching. From what was called for to achieve the goal of the study, a series of actions were carried out in sequential steps: First the Experimental design: The choice of the experimental design suitable for the experimental study is necessary to arrive at answers to the hypotheses of the study, and has a prominent role in the experimental setting of the study, and serves as a broad lines for the implementation of the experiment and the planning of the circumstances and factors surrounding the problem closely and observation It follows closely [9], adopting a descriptive approach to accurately describe the phenomenon and express it qualitatively or quantitatively, as well as the one-group experimental approach. Second The research community and its sample**:** The study community consists of all individuals, persons or objects who are the subject of the research problem [10]. The current research community is from the holistic Society of the Faculty of the Imam al-Azam University for the academic year (2017/2018) and the Human Resources section of the college was visited to obtain the number of teaching staff of both sexes (349). The sample of the research was made up of a random sample (23) of the total number of teaching staff for the academic year (2017/2018) and over three weeks. Third identification and preparation of research tools: (Cognitive testing, notes card). And presented to the specialized authorities. The first tool: building cognitive testing: The researcher prepared a test to measure the cognitive aspect of the effectiveness of tablets in the development of skills, and chose from the types of objective tests the type of choice of multiple. The number of paragraphs (50) Paragraph aimed at measuring skills in the university teaching and using tablets, the test was presented to a group of experts and specialists in the curriculum and methods of teaching, measurement, evaluation and educational techniques, to benefit from their opinions and observations about it, and the amendments were made required by their guidance and observations. Eighty percent and more were adopted as criteria for the validity of the paragraphs, thus achieving virtual honesty. Internal consistency: The test was applied to the sample for calculating internal consistency, and then the degree of correlation of each test paragraph was calculated in the overall degree of the test, and table (1) shows the results obtained. Table (1) refers to the correlation coefficient values for the entire test paragraphs and is statistically significant; therefore, all paragraphs are appropriate to measure what they are developed for; the test is validated. The content of the course material trained by the teaching staff was analyzed when applying the experiment to its components, specifying the goal of the test to be achieved at the end of the course and determined the behavioral procedural objectives according to all levels of the Blum classification in the cognitive field, and then prepared the table of specifications according to the calculation The importance and relative weight of each level of cognitive objectives, so as to build the identified cognitive test of the type of multiple choice of the four alternatives, and formulas according to the objectives previously identified, the rules of preparation of the multiple choice test were taken into account when formulating test questions, and formulated The test instructions are briefly and clearly placed on the front of the test, then the content is validated. Table 2 shows the value of the stability coefficient and the overall average of the field. Table (2) shows the value of the stability factor for the five areas, and the overall stability factor of the instrument by finding the correlation coefficient between the observed performance scores, where the researcher used the card to evaluate the performance of the teaching staff in the initial lectures until they reached the final evaluation, and the coefficient was calculated The correlation between the grades observed with the initial observation and the final observation, the total value of the reliability coefficient of the note card (0.9063), and is a high persistence value. The general arithmetic mean of the domains is (2.23).

RESULTS AND DISCUSSION

Explains the results of the statistical operations showed the effectiveness of tablets where their use

has the positive effect in the development of skills in the university teaching, which may be due to: The tablets allow the teacher to rely on his skills in terms of interacting with them positively to benefit from them on the professional side which was born have fun at work made the lecture more dynamic. The difference between the before and after testing in favor of the dimensional test in the university teaching is more receptive and inclined to modern methods in the teaching process, born have more motivation to be able to skills related to tablets that have increased their eagerness to be able to have many skills. To answer the query question, how effective are tablets in developing the skills of the university teaching staff? This question was answered by testing the following two hypotheses: To verify the first hypothesis and states: there is a difference of D statistic at the level of statistical significance (0.05) between the mid-grades of the teaching staff in the experimental group in the tribal and postgraduate measurement to test the development of skills in the university teaching using tablets, in favor of dimensional measurement. It is therefore found that there is a statistically significant difference at the level of statistical significance (0.05) between the mid-grades of the teaching staff in the experimental group in the tribal and postgraduate measurements to test the skills development of the university teaching staff using tablets, for the benefit of dimensional measurement. To test the validity of this hypothesis, a statistical treatment was carried out using the Wilcoxon test (Wilcoxon) for two related samples to compare the degree of application of tribal and other tests in the development of teaching skills using tablet devices.The value of (z) calculated (8.79-) in the measurement of skills is less than the (z) tabular value of (17) at an indication level (0.05), one-party indication, and a sample (23), which shows that the teaching staff benefited greatly from the course lectures. This may be because the lectures for the course concerned have helped to develop and improve skills and have enabled teaching staff to acquire new skills. This confirms the effectiveness of tablets in the development of skills and the development of educational process and this corresponds to many previous studies as in the study [11-14]: To verify the second hypothesis, it states: there is a difference of d at the statistical significance level (0.05) between the middle grades of the teaching staff in the experimental group in the tribal measurement and the follow-up of the note card including the development of skills in the university teaching using tablets for the benefit Dimensional measurement.To test the validity of this imposition, the value of (v) is calculated to denote the difference between the mid-grades of the teaching sample in the tribal and secondary measurements, using a two-intermediate test for the research sample, for the tribal and other applications for the results of the observation card where the value (t) calculated Reached (26.860) and is statistically function at (0.05) level and degree of freedom (34) This indicates the existence of statistically significant differences between the average grades of teachers in the results of the observation card, which indicates the development and high level of skills among university teaching staff in the use of tablets. The ultimate objective in the development of the educational and educational process.It resulted in: the course management skills of the tablets were well received by the study sample, with an average general arithmetic for the first field (2.33), and the second area: the skills of content management in tablets (1.98), and the third area: the skills of using hardware calendar tools The tablet got (2.47), and got the fourth area: the skills of using communication tools on tablets (2.25), and finally got the fifth area: the skills of using student management on tablets (2.13), while the overall average of the entire fields was good (2.23).

Table 1. Shows the results obtained, * * Function at level (0.05) * function at level (0.01)

Correlation coefficient	Paragraph	Correlation coefficient	Paragraph	Correlation coefficient	Paragraph	Correlation coefficient	Paragraph	Correlation coefficient	Paragraph
0.378**	41	0.377**	31	0.481**	21	0.294*	11	0.374**	1
0.295*	42	0.4**	32	0.291*	22	0.397**	12	0.391**	2
0.421**	43	0.374**	33	0.289*	23	0.402**	13	0.421**	3
0.291*	44	0.385**	34	0.39**	24	0.378**	14	0.388**	4
0.374**	45	0.375**	35	0.415**	25	0.291*	15	0.401**	5
0.378**	46	0.402**	36	0.294*	26	0.388**	16	0.415**	6
0.402**	47	0.378**	37	0.401**	27	0.385**	17	0.272*	7
0.291*	48	0.401**	38	0.388**	28	0.392**	19	0.279*	8
0.294*	49	0.413**	39	0.413**	29	0.29*	20	0.374**	9
0.397**	50	0.375**	40	0.391**	30	0.381**	18	0.288*	10

Table 2. Shows the value of the stability coefficient and the overall average of the field

Overall average	Stability Factor value	Areas	
2.33	0.9158	First area: Course management skills in tablets	1
1.98	0.8788	Second area: Content management skills in tablets	2
2.47	0.9379	Third area: skills of using calendar tools in tablets	3
2.25	0.9017	Forth area: Skills of using communication tools in devices	4
2.13	0.8977	Area 5: Skills of using student management in tablets	5
2.23	0.9063		The total stability coefficient value of the note card, and the overall average

CONCLUSION

The use of tablets to develop the skills of the university teaching staff has proven its effectiveness. The introduction of tablets is an effective way of does his rule the right to the education of an educated in cooperation, by raising the education of the learner in the subject matter and in a way that is not and his report the traditional pattern that He used it.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Basic Education/University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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Using the Constructs of the Health Belief Model in Changing the Health Beliefs of Male Nurses about Testicular Self-Examinations

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ABSTRACT

A randomized controlled trial was used in this study, which was conducted at Al Hussein Medical City in Karbala. A random sample consisting of (80) nursing staff and males was selected. This sample was divided into two groups: the study group consisted of (40) nurses and a control group consisting of (40) nurses. A self-administration questionnaire was used for data collection and consisted of four parts: (a) demographic and social characteristics, (B) general health information; (c) identification of smoking behavior; and (d) measure of self-examination of test scores. The results of this study showed that there were significant differences between all concepts of the model of health beliefs related to tests of testicles (perceived readiness, perceived risk, perceived benefits, perceived obstacles, signs of doing work and self-efficacy) in all tests. In addition, there was a significant correlation between the perceived risk of testicular cancer and the perceived risk of testicular cancer in all tests. This study concluded that health education based on the model of health beliefs was effective in improving all the key concepts of the model of health beliefs.

***Keywords**: Health Belief Model, Testicular Self-Examination*

INTRODUCTION

Cancer is a generic term for a wide range of diseases. Cancer is characterized by the growth from unnatural cells out of outlines that can then Piercing adjacent parts of the body or injuring the other (World Health Organization [1]. Cancer causes one in eight deaths worldwide and is rapidly becoming a global pandemic (American Cancer Society [ACS], 2018). Because of the development and elderly in humans, the worldwide the burden is likely to grow to 21.7 million cancers new stats and 13 million death in cancer simply [2]. 70% and more of all which deaths in cancer usually happened in low- and middle-income nation. This cities from expect have two-thirds new cases of carcinoma in the world. By 2050, approximately 14 million new cases will emerge compared to that in 2012 (Union for International Cancer Control [UICC], n.d.; World Health Organization [3]. There are about 200 known types of cancer (UICC, n.d.), one of these is testicular cancer (TC). TC is the most common cancer and mainly affects in men 15-45 years of age. Without a identified way to avoid the illness, care giver specialists must encourage awareness and primary finding of TC [4]. Testicular tumors falls into two main types; seminoma which is a form of testicular cancer containing only one type of cancer cell. It is normally found in men between the ages of 30 and 60 years, but can happen at other ages. Whereas, non-seminoma germ cell tumor (NSGCT, often known as a non-seminoma) is made up of many different types of cancer cells grouped together. It is more common in younger men, most often between late teens and early 40 [5-7]. Non-seminomas tend to grow and spread more quickly than seminomas [5]. One of the highest fears to well-being and wellness is TC among 15- 45-year-old in men. To encouraging awareness need to a intensive exertion in the literature, risk factors, and blocking procedures is warranted [6]. The lack of material distribution about the illness's occurrence, commonness, etiology, handling, and prevention procedures within the overall population

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contributes to a knowledge shortage concerning awareness and preventive behavior execution [8]. A hard lump in either testis is the usual symptom of testicular cancer. The lump is usually painless but in about one in 10 men, it is painful or tender. In a few men, constant backache, coughing or breathlessness, and enlarged or tender nipples may signal that the cancer has spread [9]. Early diagnosis is considered crucial in the successful treatment of TC. Testicular self-exam (TSE) is an important method to overcome the late-stage diagnosis of TC [10,11]. TSE is a painless self-screening process, which is considered easy to learn and perform, and encourages males to take responsibility for their own health. TSE is vital in identifying early symptoms of testicular cancer when conducted properly by men in the high-risk group (15-44 years-old) [12]. For men, monthly TSE, starting at puberty, is also an effective way of detecting testicular cancer at an early, and potentially curable, stage. TSE is not just a method to detect early stages of TC, but should be used to increase bodily self-awareness and raise informed decision-making (IDM) among men. By increasing IDM among men and making them further self-aware of their bodies, they may in turn feel more comfortable discussing men's health issues with others. This study aims to (1) determine the efficacy of the HBM-based health education in changing participants' health beliefs about performing testicular self-examination, (2) identify the association between participants' age and perceived susceptibility, perceived severity of developing testicular cancer, perceived benefits, barriers, cues to action, and self-efficacy of performing TSE.

MATERIALS AND METHOD

A Randomized Controlled Trial design was used to guide this study. In this study, a number of variables were examined to determine each subject's predisposition to adopt and commit to TS examinations including age, marital status, educational qualification and how many time doing TSE. The study population included male nurses who age 20–45-years who were recruited from The Imam Al-Hussein Medical City in Karbala City, Midwestern to Iraq. Sample and sampling. The Imam Al-Hussein Medical City hospital; a 400-beds hospital, was selected randomly through a simple random sampling procedure. All hospitals of the Karbala City were written in identical pieces of paper and put into a flask. These pieces were stirred well and then one of the colleagues drawn one piece. A probability systematic random sampling method was used for selecting the study sample. The total number of nurses in this hospital is 780; of which, 260 male nurses. Of these 250, there are 225 who age between 20-45-years-old. The number of elements in the population N = 80 male nurses. Based on an effect size of 0.6, α error probability of 0.05, and a power of 0.80, the minimum required sample size for each group would be 36. The researcher distributed (100) copies of the study questionnaire to the accessible male nurses' with age between 20-45 years old. The returned questionnaires were 96 with a response rate of (96.0%). The number of incomplete copies was 14 which were later excluded. Thus, the final sample size n = 40 for each group. The list of all male nurses' aged between 22-45-years and holders of an associate and bachelor's degrees in nursing were selected. The first name was chosen randomly. This name was assigned into the study group and the next name was assigned into the control group. By dividing the population size by the desired sample size 225/40), the result is 5.6 which means that every 6th nurse on the list would be included in one of the two groups. One of the researchers brought the nurses' names list and with a blinded eyes, the researcher put his finger on this list. The start point name was an odd on this list was assigned into the study group and next even name assigned into the control group. Every next 6th nurse; both odd and even, would be assigned into the corresponding group till getting the desired sample size. Study procedure. RCT was used in the present study with the use of pretest, posttest I, and posttest II. Both groups were pretested on February 1st, 2018. The intervention was implemented by introducing the health education materials (PowerPoint presentation and a booklet) that focused on all constructs of the HBM (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy) for the study group only on February 7th-8th, 2018. The posttest I was conducted on March 20th, 2018. The posttest II was conducted on April 30th, 2018.

Perceived susceptibility scale. The first construct is perceived susceptibility was used to measure the likelihood of getting TC. This scale is a 7-point Likert type scale that is composed of six items. These items were measured on a 7-point Likert scale. Responses on this scale range from 1 (Strongly Disagree) to 7 (Strongly Agree). The total scores range from 6 to 42 with a higher score indicating higher perceived susceptibility of developing TSE. This scale showed good internal

consistency (Cronbach's alpha is 85).

The perceived severity "seriousness" scale. The perceived severity "seriousness" scale was used to measure one's belief about the seriousness of contracting TC. This scale is a 7-point Likert type scale that is composed of 12 items. These items were measured on a 7-point Likert scale. Responses on this scale range from 1 (Strongly Disagree) to 7 (Strongly Agree). The total scores range from 12 to 84, with a higher score indicating higher perceived severity of the TC. This scale showed good internal consistency (Cronbach's alpha is 85).

The perceived benefits scale. The perceived benefits scale was used to measure one's an individual's assessment of the value or efficacy of taking TC screening. This scale is a 7-point Likert type scale that is composed of three items. These items were measured on a 7-point Likert scale. Responses on this scale range from 1 (Strongly Disagree) to 7 (Strongly Agree). The total scores range from 3 to 21, with a higher score indicating higher perceived value of performing the TSE. This scale showed good internal consistency (Cronbach's alpha is 75).

The perceived barriers scale. The perceived barriers scale was used to measure one's possible obstacles to taking TSE. This scale is a 7-point Likert type scale that is composed of eight items. These items were measured on a 7-point Likert scale. Responses on this scale range from 1 (Strongly Disagree) to 7 (Strongly Agree). The total scores range from 8 to 56, with a higher score indicating higher perceived barriers to performing the TSE. This scale showed good internal consistency (Cronbach's alpha is 85). A self-report questionnaire was used for data collection. Distributing questionnaires in person enables the SR to demonstrate the instructions before the participants start answering the questions. The estimated time range for each participant to complete the study questionnaire ranged between 15-30 minutes, to be reaffirmed by the pilot study. The data were represented by levels of measurement at the nominal level for some of the demographic variables such as the marital status, smoking status, and performing TSE. While the ordinal level data will be collected to measure participants' educational qualification. Data collection was performed through the use of the study instrument and the application of health education materials. The age mean for participants in the study group is 31.2 ± 7.1; more than two-third were within the age group of (22-28) years-old (*n = 17*; 42.5%), followed by those who were within the age group of (36-42) years-old (*n* = 14; 35.0%), and those who were within the age group of (29-35) years-old (*n = 7*; 17.5%). For the control group, the age mean is 33.4 ± 6.1; two-fifth were within the age group of age group of (22-28) years-old (*n = 16*; 40.0%), followed by those who were within the age group of (29-35) years-old (*n* = 15; 37.5%), and those who were within the age group of (36-42) years-old (*n = 9*; 22.5%). Concerning the marital status, most in the study group were married (*n = 26*; 65.0%) compared to those who not married (*n = 14*; 35.0%). For the majority are married (*n = 32*; 80.0%) compared to those who are not married (*n = 8*; 20.0%). Regarding the educational qualification, more than a half in the study group hold an associate degree (*n = 22*; 55.0%) compared to those who hold a bachelor's degree (*n = 18*; 45.0%). For the control group, most hold an associate degree (*n = 24*; 60.0%) compared to those who hold a bachelor's degree (*n = 16*; 40.0%). There is statistically inverse correlation between participants' age and their Self-Efficacy of performing TSE (*r = - .500*; at p-value < 0.01). The values of the Perceived Susceptibility of contracting testicular cancer for the study group noticeably decrease by time (Pretest = 14.23, Posttest I = 51.47, Posttest II = 59.04). For the control group, such values slightly decrease by time (Pretest = 22.550, Posttest I = 22509, Posttest II = 22.15). The values of the Perceived Severity of testicular cancer for the study group noticeably decrease by time (Pretest = 39.37, Posttest I = 21.10, Posttest II = 9.88). For the control group, such values slightly decrease by time (Pretest = 33.85, Posttest I = 34.75, Posttest II = 35.65).

Table 1. Participants' Sociodemographic Characteristics

	Study (N = 40)		**Control (N = 40)**	
	Frequency	**Percent**	**Frequency**	**Percent**
Age: Mean (SD) (Study G.): 31.2 ± 7.1 Mean (SD) (Control G.): 33.4 ± 6.1				
22-28	17	42.5	16	40.0
29-35	7	17.5	15	37.5
36-42	14	35.0	9	22.5
Marital Status Upper lower class				
Not married	14	35.0	8	20.0
Married	26	65.0	32	80.0
Educational Qualification				
Associate degree (Diploma)	22	55.0	24	60.0
Bachelor's degree	18	45.0	16	40.0

Table 2. Correlations between Participants' Age and Study Variables in the Pretest Time

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Age	-											
2. Intention	.169	-										
3. Attitudes	.193	-.029	-									
4. Subjective Norms	-.133	.004	-.016	-								
5. Perceived Behavioral Control	.026	-.052	-.034	.224	-							
6. Perceived Susceptibility	.309	-.149	.048	-.026	-.059	-						
7. Perceived Severity	-.113	-.014	-.099	-.109	-.316*	-.170	-					
8. Perceived Benefits	-.138	-.334*	.111	.068	-.013	.047	.178	-				
9. Perceived Barriers	-.243	-.105	.208	-.084	-.031	.016	-.197	-.013	-			
10. Health Motivation	-.037	-.083	.084	.126	.022	-.226	.147	.141	.234	-		
11. Cues to Action	.028	-.125	.316*	-.174	.046	-.030	.022	-.058	-.009	-.195	-	
12. Self-Efficacy	-.500**	-.395*	-.265	-.029	-.128	-.169	.285	.292	.163	.135	.090	-

Table 3. Descriptive Statistics for the Values of the Perceived Susceptibility over Time

Self-Efficacy	**Mean**	**Std. Deviation**	**N**
Study Pretest	14.23	11.245	70
Study Posttest I	8.20	12.527	70
Study Posttest II	7.10	14.514	70
Control Pretest	22.550	6.530	69
Control Posttest I	22.50	8.105	69
Control Posttest II	22.15	7.337	69

Table 4. Descriptive Statistics for the Values of the Perceived Severity over Time

Perceived Severity	Mean	Std. Deviation	N
Study Pretest	39.73	11.245	70
Study Posttest I	21.10	12.527	70
Study Posttest II	9.88	14.514	70
Control Pretest	33.85	6.530	69
Control Posttest I	34.75	8.105	69
Control Posttest II	35.65	7.337	69

CONCLUSION

The HBM-based health education positively influenced participants' perceived susceptibility of contracting TC, the perceived severity of TC, the perceived Benefits of performing TSE, and the Perceived Barriers to perform TSE.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Karbala Health Directorate, High Vocational Health Institute, Iraq and all experiments were carried out in accordance with approved guidelines.

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Effectiveness of Polytechnic (Applied) Theory in the Development of Information Processing Methods among Secondary School Students

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ABSTRACT

The objective of the research is to identify the effectiveness of the Polytechnic theory in the development of the information processing methods of the secondary students. To achieve the goal, the zero hypothesis was established. That assumes there is no statistically significant difference at significance level (0.05) between the average scores of the experimental group who will study according to the strategies of the Polytechnic Theory And the average score of the control group who will study according to the usual method in the scale of information processing methods, and to verify them, the experiment was implemented in the second semester of the academic year (2017-2018), The study sample consisted of (64) fourth grade students in the Al-Jihad preparatory school. The two groups were equalized in the following variables: The chronological age, IQ test scores, the scale of information processing methods built by Badran (2000) was used and the experiment lasted 8 weeks. At the end of the experiment, a scale was applied to the two groups. The results were then analyzed and showed that the students of the experimental group were superior to the control group who studied in the usual way.

Keywords: *Polytechnic theory, information processing methods, secondary stage.*

INTRODUCTION

The human mind is a distinctive and important creature of man and without it, man can't follow his life properly and make the right decisions. As the mind works and thinks in orderly steps. The mind first observes the information, when specific information is mentioned, then the brain notice it, the observation may be by voice or image, after observation, the brain preserves the observation and it is concentrated in the brain in short-term memory. Then the brain begins to analyze the observation, and the brain may produce certain information through this observation then stores it in the long-term memory. The subconscious mind affects the behavior of the brain, and subconsciously stores information and transmits it to habits and behaviors over time, which leads to the human acquisition of new actions without notice. In the case of human exposure to the problem, man identifies the problem and then analyzes it to determine its results, then looking for suitable solutions, possible and fast-acting, and if appropriate solutions are found, it is implemented immediately to resolve the problem, this is called information processing [1]. The interest in learning methods is a form of information processing that has appeared in many research and studies under multiple names such as learning how to learn, knowing how to identify, knowing how to remember, mental skills training, memory enhancement strategies, and strategies for cognitive preference [2]. These concepts all refer to the individual's way of thinking and his way of understanding, remembering and cognition, which is based on formulas of information classification, composition, analysis, storage and retrieval when necessary, these processes are practiced by the individual in his daily dealings with the information and the study material and contribute to the development of the individual's perception and skills and achieve excellence and high achievement [3]. It is considered that the individual is capable of handling,

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processing, storing and retrieving the information and the processes used in this are processes that take place within the mind before the response is issued, in the form of cognition, thinking and solving the problems of individual processing of information [4]. The present research aims to identify the effectiveness of the applied polytechnic theory in the development of information processing methods among secondary school students.

METHODODLOGY

It includes an overview of the procedures that have been carried out to achieve the research objectives, starting with the research methodology, experimental design, defining the research population and its sample, and the equivalence of the research groups (experimental and control), preparation of research materials and tools, procedures for applying the experiment and presentation of the statistical means used, and will be presented as follows: The researcher followed the experimental method to know: (The effectiveness of the Polytechnic theory in the development of information processing methods among secondary school students) because it is the appropriate approach to the nature of research, and represents one of the scientific research methods used in educational and psychological research.

The Experimental Design:

The researcher chose the partial control experimental design, because it is more suitable for his research procedures.

Research Population

The current research population represents fifth-grade students in the secondary day school for boys in the center of Babil province for the academic year (2017 - 2018). To choose the sample of schools, the researcher visited the General Directorate of education for Babil province under the book issued by the University of Babylon – Appendix No. (1), to identify the names of preparatory and secondary schools for boys only affiliated to them, which lies within the boundaries of the center of the province of Babylon.

Research Sample

The preparatory school for boys was selected in the center of Babil province in order to conduct the research. It was found that it consists of four divisions of the fourth scientific grade (A and B). A random sampling method (The lottery method) was used to choose the class (A) which have (32) students to represent the experimental group, and they will study according to (Polytechnic theory strategies), and in the same way was randomly chosen class (B) to represent the control group which have (32) students who will study according to (the usual method).

Research Group Parity

The researcher conducted a statistical equivalence between the experimental and control groups in some variables that affect the results of the experiment. Despite that the researcher chose the two groups in the random lottery method, although the students of the research sample are from a very similar social and economic community and study in one school, the equivalence of the following variables was done: (the time age calculated by months, the first semester grades, and the IQ test). The researcher performed the equivalence between the two research groups in the variables mentioned above. And the results are shown in Table (1).

Preparing Research Requirements

The research requirements are the basic elements upon which the research is carried out, according to which the research procedures are continued. These requirements are as follows: (The scientific material (content): The scientific material that the researcher should teach to the students of the two research groups during the period of the experiment (second semester) for the academic year (2017-2018) was selected. The scientific material included chapters (4^{th}, 5^{th}, 6^{th}) The researcher has prepared 16 plans for the experimental group that is taught according to the strategies of the Polytechnic Theory and the same for the control group which is taught according to the usual method.

Statistical Analysis of Scale Paragraphs

The analysis of paragraphs is defined as a study of evaluating their effectiveness through the students' response to each of the scales. The aim of this procedure is to keep the good paragraphs in the scale [5]. In order to verify the analysis of the paragraphs statistically, the scale was applied to the survey sample. After applying the scale, the researcher extracted the following:

Distinction strength of paragraphs

The primary objective of calculating the distinction

strength of paragraphs is to exclude paragraphs that do not distinguish between the examinees and to retain those that distinguish them. Therefore, the researcher marked the answer of the students and determined the total score obtained by each student in the scale, and then arranged grades from the highest to lowest grade, and chose (27%) of the highest grades and (27%) of the lower grades to represent the two extreme groups and to calculate the coefficient of discrimination between the groups paragraphs scores (upper and lower), the T-test was then used for two independent samples to extract the difference between the mean of the upper and lower groups in each paragraph of the scale, the results showed that all calculated (t) values were higher than the tabulated value of (2,000) at the significance level (0,05) and the degree of freedom (52).

The paragraph relating to the total degree of the scale

Since the discriminatory strength of paragraphs does not determine their homogeneity in the measurement of the phenomenon need to be measured, there may be similar paragraphs in their discriminatory strength but they measure different behavioral dimensions [6]. Therefore, the researcher found the relationship of each scale paragraph to the total degree and found that all Pearson correlation coefficient values were higher than the tabulated correlation coefficients which were (0,113) at statistical significance level (0,05) and degree of freedom (99).

Psychometric Characteristics

All the psychometric characteristics of the scale (honesty, stability) were extracted, as follows:

The structural honesty of the scale: Honesty is one of the psychometric characteristics that reveal the extent to which the scale achieved the purpose for which it was prepared. Anastasi believes that honesty is positional because it is calculated from the grades when applied to the sample of students, which is relative rather than absolute (Anastasi & Urbina, 2010: 115). This kind of honesty has been achieved by extracting two indicators: the distinction strength and the relationship of the paragraph to the overall degree.

Stability refers to the accuracy and consistency of an individual's performance, and also to the stability of results over time (Anastasi & Urbina, 2010: 142). By calculating the stability coefficient of the scale using the general equation of Vaccronbach, the stability coefficient was (0.73), thus the test became ready for implementation.

Extracting test paragraphs

The paragraphs of the achievement test were formulated in its preliminary form in the light of the test map, the researcher chose the type of test (multiple choice) which is one of the best objective tests. The test consisted of (40) test paragraphs, which were distributed on the Blooms cognitive levels (knowledge, understanding, application, analysis, composition, rectification) from the Physics book.

Test instructions

Specific instructions and guidance were written on how to answer (choosing one correct alternative to the paragraph, answering all paragraphs, answer time, typing full name, grade, and class in the assigned space).

The honesty of the test

The honesty of the test has been verified and content certified, the results showed that the apparent honesty obtained the proportion of agreement (80%) by the arbitrators and specialists, as for the validity of the content, the results showed that all the items of the achievement test are statistically significant, so the achievement test is honest in measuring the comprehension of the fourth grade students in physics.

Statistical Methods

The researcher used the t-test for two independent samples to make the parity between the experimental and control groups. The Pearson correlation equation was used to correct the correlation coefficient between the test segments (even and odd scores) after the Pearson correlation coefficient was calculated.

RESULTS AND DISCUSSION

The search results are presented according to the sequence of its hypotheses as follows: To identify the significant difference between the instantaneous achievement scores of the experimental and control groups. The t-test was used for two independent samples, and the difference was statistically significant at significance level (0.05) with a degree of freedom (58). The calculated t-value was (6.09) which is

greater than the tabulated t value (2) as illustrated in table (2). Thus the first zero-hypothesis was rejected. To determine the significant difference between the mean scores of the information processing methods for the experimental and control groups, the t-test was used for two independent samples. The difference was statistically significant at (0.05) with a degree of freedom (58), where the calculated (T-value) was greater than the tabular value (2), as illustrated in Table (3). Thus the second zero-hypothesis was rejected. It can be said with 95% confidence that there is an ability to solve problems in the experimental group compared to students of the control group. This indicates that there is a clear effect of the Polytechnic theory strategies in teaching students of the experimental group the scientific thinking skills compared to students of the control group. The researcher found that these results were due to effectiveness of the Polytechnic theory, as it turned out that he contributed in teaching the students of the experimental group the skills of scientific thinking, and contributed in raising the level of their academic achievement as the achievement of the experimental group was better than the achievement of control group with a statistical difference. It is clear from the results of this research that the students of the experimental group used the higher thinking processes during the analysis, synthesis and evaluation of Bloom classification and interpretation and experimentation as well as stimulate their motivation and eager to learn the skills of scientific thinking through diversity in the use of teaching methods appropriate to the teaching plans and the use of activities and teaching aids with feedback and enhancement. As well as the clarity of behavioral purposes at the beginning of the educational material as the students of the experimental group have studied the material in an unusual way they have been subjected to several positions included in the strategies of the of Polytechnic theory, For example, when teaching predictive skill to students, the researcher gives students a number of questions that measure their ability to predict after learning this skill. This leads to the organization of students' efforts towards completing the educational tasks and makes the educational process more effective and successful, and easier for both the researcher and the student. All these are positive indicators to reach the objectives of the strategies of Polytechnic theory in raising the level of achievement of students and enhance the educational - learning process.

Table 1. The equivalence between the two research groups

Variable	Group	Sample Number	Arithmetic Mean	S.D.	D.F.	T-Value		Sig. level
						Calculated	Tabulated	
Age in months	Experimental	32	171.486	12.258	68	0.997	2	Not statistically significant
	Control	32	174.943	16.451				
First Semester Grades	Experimental	32	54.657	16.916		0.198		
	Control	32	53.885	15.657				
IQ Test	Experimental	32	27.771	7.814		0.758		
	Control	32	29.143	7.277				

Table 2. T-value of the achievement test for the experimental and control groups in physics.

Group	Number of individuals	Arithmetic Mean	Variance	D.F	T-Value		Sig.
					Calculated	Tabulated	
Experimental	32	81.6	45.15	58	6.09	2	Sig. at level 0.05
Control	32	68,2	102,61				

Table 3. T-value of the problem-solving test for the experimental and control groups (for two independent samples).

Group	Number of individuals	Arithmetic Mean	Variance	D.F	T-Value		Sig.
					Calculated	Tabulated	
Experimental	32	51.86	28.30	58	7.98	2	Sig. at level 0.05
Control	32	39.56	44.35				

CONCLUSION

Teaching using the strategies of Polytechnic theory created in students the skills of critical thinking rather than the use of traditional questions in physics. Teaching using the strategies of Polytechnic theory has increased the development of students' abilities to understand, criticism, analyze and interpret. Teaching using polytechnic theory strategies helps students to make the right decisions.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Basic Education, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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Cloud Platform Specification based on Bioinformatics Application

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ABSTRACT

Cloud computing technologies are evolving as a good solutions to bioinformatics problems, There are today many applications within the field of Cloud-based services in bioinformatics such as: DaaS, SaaS, PaaS and IaaS referring to Data, Software, Platform and Infrastructure as a Service respectively These services were developed based on cloud platform by the big enterprises ,. This paper, will provide the specification and field of application of the such platforms as : (google genomics), Cloud Genomics, Genomics API, and Map Reduce with correlated software such as hadoop and presents a number of existing software solutions in bioinformatics domain that use the Map Reduce programming mode to enable their application and incorporation as a graphical workflow engine. Such engine allows these results to be easily grouped together and eases the advance of open-ended analyses and encourages its. The researchers `` in Cloud genomics application like Cancer and Autism, then, present new recommendations for developing the performance of bioinformatics filed.

Keywords: *Cloud Computing, bioinformatics, Google genomics, Genomics API, Cloud Services, CloudGene.*

INTRODUCTION

Bioinformatics tools are becoming much easier to use. Research have been done dealing with large sequencing of data without time delay [1]. On-demand and pay-as-go Cloud computing model has been used to provide dynamic computing resources for construction of physical systems without commitment or upfront costs. Cloud computing are generally used for data analysis with parallel processing tools, such as Apache Hadoop and MapReduce (a programming model consisting of map and reduce. functions that is applied in Apache Hadoop to process large data sets in parallel[13]. Bioinformatics applications have broadly implemented cloud computing with Hadoop to manage large genomic data and to perform data analysis, one of the challenges in such research is how to understand and share the analysis processes results with others[4]. The following sections show some interesting applications of bioinformatics in cloud computing and parallel applications, (i.e. Google Cloud Platform (Google genomics), Cloud Genomics API, Map Reduce framework,) and give a case study of each application with real examples. In 1970 the term bioinformatics was invented by P. Hogeweg and B. Hesber to designate investigation of data and information processing in biotic frameworks [5]. Bioinformatics is new discipline to collect, store, break down, analyze and incorporate natural biological and hereditary genetics data by using computer science concepts [6]. Bioinformatics studies biology in the form of atoms or molecules and utilizes "informatics methods" used in computer science, mathematics, and statistics. The aim is to understand and sort out the related information [7]. The objective of bioinformatics is to build an understanding of the natural biological procedures and explores the integration of subatomic science or molecular biology with computer technology. Simply put, one can say that Understanding the relationship between genetics and disease is essential

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in biomedical research. Empowered by progressively economical next-generation sequencing technologies, many projects have tried to describe variations within and across populations and disease cohorts. Cloud computing represents a drive away from applications installed on local computer towards applications hosted online. The "cloud" refers to the Internet, the name was inspired by flow charts and diagrams that use often a cloud symbol to represent the Internet.) . Large comparative genomics studies and tools are becoming more compute-expensive as the number of available genome sequences rise. This reflects on the capacity and cost of local computing infrastructures which are likely to become unaffordable with the increase, especially as the breadth of questions increases [10,11]. Cloud computing environments relief this pressure and support fast, broad, and economical comparative genomics strategies.

MATERIALS AND METHOD

Bioinformatics Google genomics Applications

Google cloud platform is part of google infrastructure, it supports YouTube that can handle three hundreds 300 hrs. of video every minute and Google search which returns search results in quarter of a second with search index that is over a hundred petabytes 100pb in sites. To translate that on genomics It means data from 6 whole genome sequencing uploaded to Google servers every minute where google can both index and search the evolving of a million-whole genomic on sequences [14,15]. There is increasing acknowledgement on the importance of cloud computing for genomics data analysis. It allows the use of public cloud resources for storing, accessing, sharing and analysis of genomic data. Parallelly there is evidence at the life scientist's community that cloud based genomic data analysis is the future. Recent articles showing features that are cheaper faster and more flexible on the cloud computing resources compared to local data sets [15]. Google cloud platform resources are even sited as key public cloud computing resource and are lately used by publicly

Case study: Google genomics in Google Cloud Platform

This case study explains how Google Genomics can help store, process, explore, and share genomic data either own or massive shared datasets, like TCGA or Autism project. It discusses why Google is interested in genome data, how Cloud Platform works, the GATK pipeline, and other examples of how the service is being used. The volume of genomics information is increasing rapidly, the magnitude of genomic data will double every year to reach a billion genomes by 2025 [16]. All this Huge data magnitude will not be useful unless scientists can manage to extract clinical meaning from it .One will need to study row data using right analytical reading methods from data mining ,novel algorithms to the virtualization and machine learning As scientist scale up their studies and begin question thousands and soon millions of genomes , they will need to have a scalable technologies to manipulate ,analyze and interpret enormous data sets without the time and cost for moving that data from place to place . Google genomics that is built on Google cloud platform intends to help organize the world genomic information and make it available and useful Google cloud platform offers both infrastructures services and platform as a service. It also builds a unique genomics API that controls many genomics specific features. One can choose which service (infrastructure or platforms) One wants and genomics specific features as content - aware storage and access via web API that implement the GA4G (global alliance of genomics and health specifications.

Bioinformatics MapReduce Applications

MapReduce designates a programming framework that supports distributed and parallel processing on large data sets. MapReduce involves two distinct tasks – Map and Reduce [17,18]. The reducer phase takes place after the mapper phase, where a block of data is read and processed has been completed. To produce key-value pairs as intermediate outputs. The Mapper's (key-value pairs) output is the Reducer's input [19]. After the reducer gets the key-value pair from numerous map jobs. it aggregates those into a smaller set of tuples or key-value pairs that constitutes the final output.

Case study: MapReduce Bioinformatics using CloudGene and Cloudman

In Spite of the clear potential of the MapReduce model and the existence of bioinformatic algorithms and applications, they are yet not widely implemented in the bioinformatics data analysis. The Hadoop MapReduce model represents a simple framework for data parallelism. This is done by providing an automated runtime retrieval (both for failures in task runtime and hardware) and implicit scalability (automatic running of parallel batch

mode tasks). Two prior conditions for wider adoption and higher utilization of MapReduce tools were found by us: Easing the technicalities composing multiple existing MapReduce tools. Providing easy access to the compute infrastructure and environment. Satisfying these requirements would allow bioinformatics experts to concentrate on the analysis while the required technical details are unseen. two platforms were presented:

CloudGene: a MapReduce tool execution platform leveraging Hadoop,

Cloudman: a cloud resource manager.

These two platforms have been combined and extended to provide an available accessible Hadoop based bioinformatics Cloud environment. CloudGene, other than integrating random MapReduce tools to perform an analysis, has been developed as a two dedicated services job execution engine: an imputation service developed jointly with the Center for Statistical Genetics, University of Michigan (can be found at mputationserver.sph.umich.edu) and a mtDNA analysis service (can be found at mtdnaserver.uibk.ac.at). Cloudman is a system generating the cluster in the cloud .and allows access to the cluster in the cloud by everyone. It is known for automatically setting Galaxy on the cloud infrastructure and supporting various cloud infrastructure such as Demonstrate web services OpenStack. Scientists using Cloudman can share instances for collaboration. A scalable processing and analyzing of large datasets is enabled by The MapReduce framework by distributing the computational load on connected computer nodes, referred to as a cluster this can store data and relaunch it later . Cloudman is Used in several infrastructures, it is used in the Amazon cloud AWS (since 2010) , also Australian cloud Necter(since 2012) and there is also a big project (2015) called The Jetstream and EGI engage H2020 project . The CloudGene objective is to establish a consistent graphical execution environment for the MapReduce programs, that can be integrated by using its plug-in interface. Users can upload own version of Galaxy on the cloud using the playbook + Packer and build images using different infrastructures.

RESULTS AND DISCUSSION

How to support scientists when using MapReduce programs by simplifying the execution of MapReduce programs including data management and simplifying access to a working MapReduce cluster and maintaining data sensitivity. MapReduce: Simplified Data Processing on Large Clusters: CloudGene is a framework to build Software As A Service (SaaS) platforms for data analysis pipelines. By connecting command line programs, scripts or Hadoop applications to CloudGene, a powerful web application can be created within minutes. CloudGene supports the complete workflow including data transfer, program execution and data export. Finally we found that CloudGene + Cloudman have Similar ideas but different context.

Genome VIP: Genome Variant Investigation Platform (Genome VIP):

a system for performing variant discovery, annotation, and interpretation using cloud resources. Its intuitive, lightweight web interface enables users to detect genomic variants (single- and multinucleated variants, short insertions and deletions [indels], complex indels, and structural alterations that include translocations, inversions, and tandem duplications) in whole-genome or exome sequence alignment files (BAMs) [21]. Genome VIP is a ,multiuser open-source and cloud-aware platform .It contains a web interface to perform; discovery, annotation, and interpretation of genomic variation, using cloud- or local high-performance computing infrastructure.

Genome VIP has been used for genomic analysis in large-data projects such as:

The Cancer Genome Atlas (TCGA) Pan Can Atlas :

- The International Cancer Genome Consortium (ICGC) Pilots:
- CPTAC
- ICGC-TCGA DREAM Challenges:
- the 1000 Genomes SV
- UK10K

Genome VIP Architecture

- The functionality of Genome VIP is provided through management of three central components:
- the user's web browser,
- the Genome VIP server

- a cloud-computing resource.

Genome VIP three components (web browser, server host, cloud) are coordinated by:

- Scripting languages (blue) and cloud toolkits (green).

- Interactive web pages, written in HTML (with CSS elements) and JavaScript, provide front-end functionality.

- jQuery is a JavaScript library providing methods to modify web page content with cross-browser compatibility.

Server-side PHP modules utilize Star Cluster and S3 Tools cloud toolkits to access.

Case Study: Genome VIP

EC2 Compute (gray) and storage resources (yellow) in the cloud. Genome VIP creates within EC2 a virtual cluster, based on a machine image with preinstalled variant detection tools and supports software (collectively, "Genomics Tools") (red), that can access sequence data on S3 and EBS (Elastic Block Storage) resources (yellow). Secure channels using HTTPS and secure shell (SSH) protocols allow communication between various components.

Result of Genome VIP's case study

Genome VIP's provides high-confidence annotated somatic, germline, and de novo variants of possible biological implication using publicly available data sets. Users can direct Genome VIP to perform these tasks by selecting software from its palette of widely used bioinformatics tools and can specify provided best-practices discovery tool parameter sets or design a custom "execution profile" by adjusting the controls online or uploading parameters through the web interface. Genome VIP's design brings powerful cloud resources to bear for task-specific bioinformatics analyses without any special cloud know-how required by the investigator. Genome VIP provides flexibility for use by computational biologist power users as well as by users having expert knowledge or research needs. Its design and operational aspects aim to promote the reproducibility, transparency, and uniformity of the processing of genomic data. Although we focused on Genome VIP's cloud capability, it runs equivalently on local high-performance computing clusters with local data with preinstalled versions of the named tools. The design and implementation of Genome VIP and its usage for modern, high sample count cancer genomics and human genetics research also serves as a starting point for integration of additional tools and capabilities and expansion to other cloud-computing platforms. The main analyzed in the paper concerns; privacy and security issues (e.g. integrity, confidentiality, authenticity, accountability, audit, on-repudiation, anonymity, unlikability), Economic opportunities, Legal aspects (e.g. the US Health Insurance Portability and Accountability Act (HIPAA) limits companies from disclosing personal health data to third parties , while the Canadian Personal Information Protection and Electronic Documents Act (PIPEDA) prohibits organizations to collect, use, or disclose personal information in commercial activities). Clouds services and Map Reduce flexibility promotes them to become the preferred approaches in the near future . MapReduce offers; higher level interface and less user's explicit control of the parallelism, the ability to handle large data sets, the concept of computation to data moving, and cloud technologies better quality of service simplify the implementation compared to traditional systems.

CONCLUSION

Cloud computing is a style of computing in which dynamically scalable and often virtualized resources are provided as a service over the Internet. Users need not have knowledge of, expertise in, or control over the technology infrastructure in the "cloud" that supports them. Cloud computing technologies are emerging as solid and economical solutions to high performance computing. To date, these technologies have had a partial impact on comparative genomics. In this paper; the deployment of a popular comparative genomics tools is discussed. We found that in spite of the confusion that exists regarding the definition of the cloud, IT managers are deploying cloud computing initiatives aggressively to achieve bioinformatics objectives.

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and all experiments were carried out in accordance with approved guidelines.

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Effect of Strategy of "Plan" in Correcting Wrong Geographical Concepts and Commuting the Exam Concern of Literary 5th Level's Student

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ABSTRACT

The term concern comes from Latin word " Anxietes" that means a turbulence in the mind which is a psychiatric condition known in the past as a worry and sadness that hurt the human psychologically and physically, concern is a kind of tense that attack the individual because interference of many factors that lead to inability of required performance for his works and duties beside reluctance in ensuring his necessary needs easily, concern may leads to worseness in efficiency of social activities of the patient in response to these requirements in his ambient and weakness of his ability in keep promises, theories were in contrast to explain concern, Freud sees that the reason of concern is the existed ideas in daily life, and expectation of penalty as a result to express prohibited desires or any banned motives also he sees that the roots of concern that hit the human are attributed to early childhood period of his life, the test's concern or as it is sometimes called as fear from exam (it is a psychiatric condition that a category of students have suffered from in different level of educations , elementary, secondary and university).

Keyword: *PLAN, STRATEGY, EFFECT*

INTRODUCTION

Education is considered a an active social process that helps the community to preserve requirements of it's existence and continuity that is via education's active role which interprets philosophy of society into concepts and skills the individual can earn, it also strives toward achieving a balanced growth for individual in all mental, physical and sensual sides. So, countries, according to their development level, give tremendous importance for those who are in charge of education and breeding [1]. Education is the tool of teaching in achieving it's aims through teaching the individual, developing him to be able to adapt and interact positively with environmental, natural and social influences and feel matching and durability. Since curriculum is a part of educational process, then it is a means to achieve education's goals, as it helps students on comprehensive growth in (trends, directions, needs, problems, capabilities and readiness) that lead to happening of changes in their behaviors positively, curriculum represents every study, activity or experience earned by learner under supervision and direction inside or outside the classroom [2]. While teacher plays important role building cultures, societies and inherited factors of educational process and interact with learner and earns this interactin (trends, skills, knowledge and values) , teachers in the prospects of developed communities is not mere an eradication eraser and a teacher of sciences, knowledge and values but a countries and nations maker to make a progress in all fields [3]. Successful teacher is that one who has a wide knowledge in strategies of teaching methods and it's different styles and he can use them and join between them easily and flexibility to achieve teaching goals and realize very well that real test to his success in teaching is not about what he knows but what students learn [4]. Geography is considered one of the eldest branch of social branches and a major corner because it concerns studying relation between human and natural environment, styles of his interaction with land and

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environment and influences of that interaction, that is why geography collect between the two sides natural and human [5]. In addition, most distinctive features of this word is the rapid advancement of technology that includes all life fields, notably the field of education, many direction have appeared that call for research and investigate of teaching styles that increase effectiveness of educational process and its ability, field of education has witnessed a vast concern over all levels of local, Arabian and international levels, also it witnessed continuous and fast development like scientific and technological revolution, cognitive explosion, emerging of modern educational techniques, methods of teaching, teaching tools, hence a big aspiration toward making curriculums matching to nature of era, and education is obliged to change it's classic and limited curriculums, develop and modify it's programs and it's plans and styles to be a proper preparing process and comprehensive for present and future. Education is considered an active social process that help community to preserve it's basic requirements of existence and continuity via it's active role in interpreting the philosophy of society into concepts and skills which any individual can get, also aspires toward achieving a balanced growth for him in all his mental, physical and sensual sides, that is why countries endeavor to give big importance to those who work in this field of education and teaching up to their level of development and technology. Education develops with development of human communities, it's heritage and extent of spreading, many fields and specializations have been emerged nowadays were not known in the past, so it is mandatory to catch the quality and quantity of development and humanitarian knowledge, education poses one of humanitarian appearances, it is a real practice of ideas and concepts have features , phenomena, reasons, results, origins and methods may be clear or not clear in another times, it's basis has humanitarian nature depends upon the ability of an instinctual ability of an individual for psychiatric and social adaptation. The current research aims to know (Effect Of Strategy Of "Plan" In Correcting Wrong Geographical Concepts And Commuting The Exam Concern Of Literary 5th Level's Student**).** There aren't differences with statistical evidences on level (0.05) between average marks of experimental group's students that study according to strategy of "PLAN" and controlling group's students who study up to the ordinary method.

METHODOLOGY

The researcher considered the experimental method, because it is the most accurate one where the researcher takes a neutral position against the phenomena, and adjusts all variables that he considers that they influence over his research's results but one research that is intended to study it's effect over the experiment [6]. The researcher followed the procedures that ensure achieving the two aims of research, and verifying the two hypotheses that he applied, these procedures included two stages, first one was called diagnosing which the researcher tries to explore wrong geographical concepts for literary 5th grade's students. While the second stage was called therapeutically stage through which the researcher intends to use strategy of "Plan" to correct the wrong concept for the main research's sample in the geographical concepts in geography material for 5th literary stage's students. The researcher depends on experimental design of partial adjusting for the two equivalent group's experimental and controlling ones

RESULTS AND DISCUSSION

After finishing the experiment of research according to steps and procedures were mentioned in the 3rd chapter, in this chapter, researcher will show results that he came up with up to their target and hypothesis via balancing between grade averages of students of two groups of research in testing the outcomes (therapeutically) applied at the end of experiment to measure (correcting geographical wrong concepts) and discussing the results as follows: (There are no differences with statistical evidences on level (0.05) between average degrees of two groups (experimental and controlling groups in the after test) in correcting wrong geographical concepts). After correcting answers of two groups students of test items of correcting wrong concepts, results showed that mathematic average for total degrees done by experimental groups is (39,533) degree, criteria deviation was (5.4266), mathematic average of total degrees got by controlling group students (33,733) degree, criteria deviation (6,5214), to find out the mathematic difference evidence for these averages ,the researcher used (t-test) for two independent samples. From table (1) we can find the calculated "t" value which is (3,763) is more than tabulated "t" value that is (2,001) at evidence level of (0.005)and freedom degree of (58) which refers to a difference with a statistical evidence between degree average of the two group's students for

the behalf of experimental group, based on that, zero theory is neglected and accept the replacement theory that states on (there is a statistical evidence difference between average degree of experimental group's students who studied according to the pattern of Driver and average degree of controlling group's students who study by the ordinary method in the after-test results for correcting the wrong concepts of geography. Result of current study comes similar to some previous studies that showed preceding of strategy of "Plan" over the ordinary method.

Table 1. Evidence of difference between average of degrees for correcting wrong concepts of geography for two groups (controlling and experimental).

	Average	Deviation	Contrast	Two (t) values		Temp.	The statistical evidence
				Calculated	Tabulated		
30	39.533	5.4266	29.448	3.763	2.001	58	
30	33.733	6.5214	42.528				

CONCLUSION

In the shed of research's results, the researcher has come up with some conclusions represented by the following: There are many wrong concepts for 5th grade students in geography.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon, College of Basic Education, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Effect of Teaching the Reading and Texts by the Two Strategies of (SLap & CSR) On Expressional Performance of 2Nd Intermediate Grade Students

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ABSTRACT

The research aims to know the effect of teaching the material of reading and texts by using the two strategies of (Slap & CSR) on the expressional performance of 2nd intermediate grade student, researcher has created a zero hypothesis compatible for research, and chooses a compatible experimental design, she compared between the two group of research, then specified subjects that she would discuss during time of experiment, she also created behavioral goals and prepared teaching plans appropriate for requirements of research, she chose Al-Rubaie criteria that consists of four spaces with extreme degree of (100) and made sure of it's credibility and truth, and applied the dimensional choice, and showed results of exceeding the two experimental groups of research against the controlling group in expressional performance.

Keywords*: Reading and texts, strategies of (Slap, CSR), expressional performance, intermediate grade.*

INTRODUCTION

Expression is considered a major problem for most of students, that they fail to express about any kind of subject either by writing or verbal, also teachers explore many mistakes in that expression looks like the student didn't read or brief his Arabic language nor benefit from it's main branches because Arabic language includes many sources that all pour in one main source which the expression of senses and feelings with an intact language free from mistakes [1]. One of the most reasons that led to the spreading of this weakness of expression is neglecting this material by student and teacher as there are no specified words the teacher can rely on, Muhsin Ateyah sees that "Expression's lessons rely on diligence and comprising [2]. Also, weak expression of student to arrange their words and terms to come up with a good expression that express what they feel may be attributed to lack of external reading, students tend to short readings and don't burden themselves to read long reading and less writing in different subjects, in some case and for whole year they didn't write one or two subjects of expression, beside the spreading of slang language and wide spread of using it in many environments of educated people and reached to the teaching environment led to make the expression lesson a real problem because it requires talking with a formal language doesn't reside in their minds [3]. Based on what is mentioned above, problem of research can emanate from the following question: What is the effect of teaching reading and texts by the two strategies of (CSR, Slap) on expressional performance of intermediate school students? Human lives a social life with a group of people connected with them by relations, neighborhood, hopes, pains, goals, ideas and emotions, so he is in need to understand them to let his life straight , human groups adopted movements, voices, symbols and means for this understanding and finalized with using the language, which is now the most important ways of understanding Language has a great social value, it is a human and conceptual behavior, has social and cultural context has it's evidence , symbols and contents, also it achieve communication between individuals, by which people get connected with each other, achieving their purposes , sharing ideas, feeling and ideas, and asking for achieving their benefits from each other, God grants

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human being with this grace exclusively, and it is the most important medium of communication, the means of first community to dye his members with social dye that has a vital role in merging the individual with his community plus to having it or well-adjusting for it influence the behavior of individual and his thinking and feeling [4]. Arabic language is one of the most ancient languages historically, culturally and structurally because it carried Islamic flag to the whole world, God blessed it when his almighty make it the language of holly Quran, language of science and knowledge for long centuries, science can't be done without it, knowledge doesn't transfer without it, starts from different religious sciences to many other sciences [5]. Arabic language has preserved it's vitality, purity and fruitfulness on the contrary of other language like Akadian, Aramic and Kinan languages and this attributed to Holly Quran, plus it's strength against any strange assault, to result in proving us with different expression styles, flexibility and diverse of terms and words and wide meaning in short words that we don't find in another languages [6]. Reading is main source of culture and human knowledge, through which human can brief all surrounding ambient and realize every life activities and then brief his nation's history buried in books and major sources, and knowing the heritage of other nations [7], because it follows logic serial in dealing with written deed as an ideal factor and not a random one in withdrawing the text toward more shining places, in other words, reading with written text make an excavating work with a clear purpose, and specifying this purpose in forming the first vision of reading that represents an enrolling process includes exploring and interpretation together (**8**). Writing expression has a big importance because it all what have been written in students copybook, and is considered the medium of contact between the individual with whom is too far from him and need for such expression is so urgent in all occupations, it is not about communication but also feelings, senses opinions, needs and transforming information by a well-written speaking with all grammars rules and include good ideas [8]. Style of teacher and his behavior in teaching in front of students is so important and influences in forming their trends and growth them. Cultured teacher is that one who makes Arabic language is correlated with free reading in home or library, he would be successful when he make a tough relation between them and book by free and diverse reading beside out of curriculum materials. It is so important for the teacher to be aware of teaching methods and diverse strategies of teaching, ability to use them, to help him to choose the most appropriate one for student's ability, how much it connected to their life, their trends and needs and their future aspiration[9].

Strategy of (CSR) is considered one of the important strategies that helps student to understand the read material via preliminary show and specify difficult elements as they help students to understand and remember the read material that invest the old information in cognitive structures of learners in the new teaching via exploring relations between previous knowledge and new one that are not existed in between it and previous knowledge [10]. The strategy (Slap) represents one of the modern strategies in the process of teaching, it focused on reaching to best learning the learner can get, because it liberate the students from the classic styles in thinking and how to express themselves, and gives them the chance of expression freely and urge them for thinking, innovation and inventing. The researcher sees that the two strategies (Slap, CSR) are important strategies that depend upon the student to get information that growth their culture and increase their magnitude of language, beside they match with intermediate student's age. Researcher chose the intermediate grade to proceed the experiment of research and it represent the transitional period from childhood to early adolescence age, that enables students to practice mental processes to be able to increase their abilities of reading, understanding, thinking and reaching to solve problems that they may confront in daily life.

METHODOLOGY

The researcher used experimental method to achieve the research's goal, experimental method is considered the appropriate method for procedures of research.

Population of research and it's sample

Population

The researcher specified the research population by students of 2nd intermediate grade in intermediate and secondary schools (day time)for girls that include two classes or more in Al-Hashmiyah district that belongs to Babel province to chose a school to be the basic research sample.

A- School's sample: The researcher used the random method to chose the research's sample which the method that ensure no bias for any

specific school, after random withdrawing (Almanar Intermediate School) in Al-Hashimiyah district to be the center where experiment was implemented.

B- Student's sample: students sample was (97) student as (35) female student in the 1st experiment group, (32) female students in 2nd experimental group, (30) female student in the controlling group.

Equivalent of two groups of research.

The researcher compensated between two groups in the following variables: age of student, education of their fathers, grades of Arabic language in first semester (2017-2018).

Specifying the scientific material.

the researcher specified the subject of study that will be studied during period of experiment, subjects were nine, from the curriculum material of reading and texts prepared for 2nd intermediate grade's students, these subjects are (will from dying man, which one is more loyal, spring, pioneer of chemistry: Jabir Bin Hayan, fresh of hope, Beauty of my country, Noor Mohammed, intact logic).

Behavioral goals and teaching plans: The researcher has created (102) behavioral goals according to Bloom classification for behavioral goals were offered to check by experts and referees to make sure of their validity, also she prepared eight teaching plans for each group of the research's groups according to the curriculum materials, she offered three of samples to specialist expert to check their validity.

RESULTS AND DISCUSSION

Main Zero Hypothesis To verify validity of zero hypothesis after correction of student's answers, she used analyzing uni-contrast (F) to make sure of evidence difference evidence between groups table 1. After statistical processing explained above and existence of differences with statistical evidence, value of (F) calculated (14,13) is bigger than tabular value of (3,07) in the after test of expressional performance.

Zero hypotheses and their types:

To verify the validity of zero sub-hypothesis, the researcher used Shiveh's method for diverse dimensional comparison as shown in the table 2. It is clear to see in the table above, results of differences among three groups of research, average of students' grades of 1st experimental group is (62,94) , average grade of controlling group is (52,00), that refers to existence of statistic evidence differences as the calculated value is (11,17) and it is higher than the critical value (2,48), also appears that average grade of 2nd experimental group is (62,78) , average grade of controlling group is (52,00), that refers to existence of differences with statistical evidences as calculated value was (10,39) and it is higher than critic value of (2,48), average grades of first experimental group is (62,94), average grade of second experimental group is (62,78), that means no existence of difference with statistic evidences as the calculated value is (0.003) and it is less than critic value of (4,48). Results above mentioned showed exceeding of 1st and 2nd experimental group over the controlling group, and no existence of difference between the two experimental groups, the researcher attribute this result to the effectiveness of (CSR) and (SLap) from the following: Training students on scientific discussion via strategy of (CSR) participates in increasing their concentration on important ideas, and neglecting unnecessary details in text, increases the ability of students on using pronunciation and meanings in new situations. Connecting between important ideas from others and increasing of their abilities to distinguish between main ideas from sub ideas via strategy of (SLap), determining the goal that subject targets and consequently this increases ability of student to understand and realize. The two strategies of (CSR) and (SLap) help the students to participate by their ideas, feelings and excitations led to creation of a favorite environment for them, hence increasing of attention and interaction and earning of experiences then improvement of their abilities. Effectiveness of teaching by two strategies of (CSR) and (SLap), the reason may be attributed to earning of students and developing of their motivation toward learning and earning of information, led to increase of their marks and developing their criticizing thinking , the right method is that one which leads to the intended goals with simplest effort and less time, and urges the motivation of students and their self-activity toward learning and positive work and active participation in lesson.

Table 1. Analyzing uni-contrast (F) to make sure of evidence difference evidence between groups

Source of contrast	Degree of freedom	Total of squares	Average of squares	F value		Level of evidence
				calculated	tabular	
Among groups	2	2446,89	1223,446	14,13		Function
Inside groups	94	8139,35	86,589		3,07	Statistically with a level of (0,005)
Total	96	10586,24	1310,035			

Table 2. Shiveh's method for diverse dimensional comparison

Balancing		First		Second		Third	
Groups		1st Experimental	Controlling	2nd experimental	Controlling	1st experimental	2nd experimental
Math. average		62,94	52,00	62,78	52,00	62,94	62,78
Two values of Shiveh	Calculated	11,17		10,39		0.003	
	Critical	2,48					
Evidence of (0,05)		Function					Not function

CONCLUSION

The two strategies of (CSR) and (SLap) have the positive effect to increase the ability of students to written expression and speed of conception for a subject. Through the interaction of the researcher with student she finds that depending the two strategies of (CSR) and (SLap) enables students to be able to connect what they have of previous information with new ones that they get.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Basic Education/ University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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Fabrication of a Solar Cells by Organic – Inorganic Hybrid Perovskites

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ABSTRACT

One of the important electronic applications in recent years is organic – inorganic hybrid perovskite materials because of their many useful characterizations particularly the low cost, tunable optical properties and high-efficiency. In this work we used varieties of lead halides, $PbCl_2$ and $PbBr_2$ to prepare two types of perovskites, $MAPbBr_3$and $MAPbBr_2Cl$ by one step method then study their properties; structural, morphological and optical properties, to fabricate solar cells from these perovskites with preparation of TiO_2 nanocrystal as electron transport material ETM by hydrothermal method. The power conversion efficiency PCE achieved is 1.2 % and fill factor FF=0.26 for $MAPbBr_3$ perovskite while the power conversion efficiency PCE for $MAPbBr_2Cl$ perovskite reached up to 0.9 % and fill factor FF= 0.25.

Keywords*: Perovskite, TiO_2, Nanorystals, solar cells, ETM.HTM*

INTRODUCTION

The perovskite one of the most famous materials in researches electronic attention in the last ten years ago because of there are some important properties ,which including long-ranged balanced electron and hole transport, tunable bandgap, facile deposition techniques, low cost and high-efficiency [1-3]. The chemical structure formula of perovskite it is ABX_3 [4,5] where A is a bulky cation which occupies a cubo-octahedral site shared with 12X anions ,usually it is represent methyl ammonium group $CH_3NH_3^+$ or formamidinium group $FA(HC(NH))^+$, and B is a smaller cation stabilized in an octahedral site shared with 6X anions e.g. Pb^{+2}, Sn^{+2} Cu^{+2}, $Ni^{+}2$,Co^{+2}, Fe^{+2}, Mn^{+2}, Cr^{+2}, Pd^{+2}, Cd^{+2}, Ge^{+2},Eu^{+2} or Yb^{+2}, and X is anion halogen e.g. halides chloride Cl^-, bromide Br^- and iodide I^-, respectively [6,7]. The perovskite kind methyl ammonium lead halide perovskite ($MAPbX_3$, MA = methyl ammonium) hybrid organic-inorganic attention has recently increased with these structure in particular as photovoltaic devices, where it's have bandgap easily effectively adjusted by changing the cation, the metal or the halide in addition the power conversion efficiency (PCE) has skyrocketed from 3.8% to more than 20% in just 10 years [2,8]. The optical properties of perovskites explain that $CH_3NH_3PbX_3$ have a direct bandgap and equal 1.55 eV ,2.2 eV and 3.0 eV for $MAPbI_3$,$MAPbBr_3$ and $MAPbCl_3$ respectively, in addition the absorption edges for $CH_3NH_3PbX_3$ perovskites its different values where the $MAPbI_3$ have great value while the $MAPbBr_3$ and $MAPbCl_3$ less than ,this effect at the highest occupied molecular orbital (HOMO) -5.23 eV -5.6 eV -5.82eV and the lowest unoccupied molecular orbital (LUMO) energy levels -3.66 eV -3.4 eV 2.94eV [11,12]. When mixed more one halide element with methyl ammonium under controlled ratios, we get a perovskite have optical properties are different at the primary perovskites $MAPbI_3$, $MAPbBr_3$ and $MAPbCl_3$, which sometimes using as enhancement of perovskites properties [13]. In this study, we focused at the preparation of $MAPbBr_3$,$MAPbBr_2Cl$ perovskites to fabricated a solar cells benefiting from TiO_2 nanorod .

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MATERIALS AND METHOD

Materials

FTO glass , acetone, 2-propanol ,Titanium(IV)

butoxide,$TiCl_4$, Methylamine CH_3NH_2 (MA) , Hydrobromied acid HBr, Hydrochloric acid HCl ,Lead halogen $PbBr_2$, $PbCl_2$ and dimethyl formamide DMF.

Preparation of TiO_2 Nanocrystal

TiO_2 Nanorod (TiO_2Nod) prepared by hydrothermal method , firstly we cleaned FTO glass by acetone ,2-propanol subsequently using the ultrasonic .Immersed FTO in the Teflon stainless steel autoclave contain the precursor of titanium perpend from adding 15 ml HCl , 15 ml deionized water and 0.25 ml titanium(IV) butoxide . The autoclave conducted for 7 hours at 170˚C with a temperature controlled furnace [14]. After hydrothermal process, the samples were cleaned with in deionized water and annealing at 450°C for 45 min .The resulting of TiO_2Ncs treatment with $TiCl_4$ by immersed in $TiCl_4$ aqueous (0.57 ml $TiCl_4$ with 100 ml deionized water) at 80°C for 30 min then annealed at 450 °C 30 min again [15, 16].

Preparation methyl ammonium salt MAX (X= Br, Cl) were synthesis similar report of described elsewhere [17] .Briefly reacting 20 ml from CH_3NH_2 with 30 ml from HBr to prepare MABr and 22 ml from HCl for MACl , in round-bottom flask beaker in the ice about 0 °C for 2h with stirring. The precipitates were recovered by putting the solution on rotary vacuum to evaporated at 60 °C for 1h to remove the solvents .The crystals were wished using diethyl ether and ethanol several times then dried by evaporated again for several hours to result crystal powder and stored it in dark dry place.

Perovskites preparation

$MAPbBr_3$ preparation mixing (0.25g) MABr , PbBr2(3.08 g) with 2 ml from DMF and stirring several hours at 60°C ,by spin-coating we dropped the solution at TiO_2Nod for 1500 rpm/5 sec ,2500 rpm/45 sec at sequentially, then annealed at 60 °C for 30min. $MAPbBr_2Cl$ preparation by mixing equal molar ratio from MACl (0.27 g) and PbBr2(1.5g) dissolved in 2ml from DMF at room temperature with stirring several hours , then dropped the solution at TiO_2Ncs substrate with spin-coating for 1500 rpm/5 sec then 2500 rpm/45 sec ,finally the film annealed at 120 °C for 30 min .

RESULTS AND DISCUSSION

The perovskites $MAPbBr_3$ and $MAPbBr_2Cl$ was fabricated to design a solar cells , first we distinguish the crystallization of perovskites by XRD were there are peaks for $MAPbBr_3$, the most important at 15, 21,30,33.5 , 43 and 46 peaks and the indexed (100), (110),(200), (210) ,(220) and (300) respectively and the $MAPbBr_2Cl$ have same peaks at 15, 21,30, 43 and 46 for same indexed (100), (110),(200), (210) ,(220) and (300) respectively. The phase of the $MAPbBr_2Cl$ it was single phase ,the space group (*pm3m*) and unit cell a=5.95 see Figure 1 [18,19]. Figure 2a shows the absorption spectrum of the perovskites , we found the absorption edge for the $MAPbBr_3$ equal 520 nm and nearly 518 nm for $MAPbBr_2Cl$ which have absorbance value higher than of $MAPbBr_3$ and this is due to the large grain size of $MAPbBr_3$ perovskite which appear in the SEM images [18-21]. The band gaps were calculated by using Kubelka –Munk method which dependent at reflectivity spectrum of perovskites for this perovskites , where the direct band gap about 2.28 eV for $MAPbBr_3$ and for $MAPbBr_2Cl$ Figure 2b, and here, it turns out that the energy gap can be tuning by controlling the component ratios of the halogens, where the energy gap approaching the values of the main compositions ($MAPbI_3$,$MAPbBr_3$ and $MAPbBr_3$) depending at the I, Br and Cl. The morphology of surface devices were determine by Field Emission Scanning Electron Microscope FESEM show in the Figure 5a for the $MAPbBr_3$ and Figure 5b for the $MAPbBr_2Cl$ perovskite ,we can see the crystal size of $MAPbBr_3$ biggest than $MAPbBr_2Cl$ perovskite . The schematic diagram of the perovskite device structure shows in the figure 3 , its consist of FTO/TiO_2Ncs/ $MAPbX_3$/Ag , the TiO_2Ncs/$MAPbX_3$ act as n-type and the $MAPbX_3$/Ag act as p-type when the light incident through the FTO glass substrate. Figure 4 shows J-V and intensity characteristic , the parameters of solar cell for $MAPbBr_3$ perovskite after illumination light equal 1.5 AM (100 $mWcm^{-2}$). The maximum values for voltage and current V_{max}= 0.22 V, J_{max}=5.5 $mA.cm^{-2}$ when the V_{oc}=0.43V , J_{sc}=10.7 $mA.cm^{-2}$ and FF=0.26 which resulted 1.23 % of $PCE = \frac{V_{max}\, I_{max}}{P_{in}} \times 100\%$ $PCE = \frac{V_{max}\, I_{max}}{P_{in}} \times 100\%$.

While the $MAPbBr_2Cl$ perovskite solar cell parameters of the perovskite which were 0.9 % for the *PCE* at V_{max}= 0.21 V , J_{max}=4.3 $mA.cm^{-2}$ when the V_{oc}=0.42V , J_{sc}=8.3 $mA.cm^{-2}$ and FF=0.25. When compared the results in both solar cells the *PCE* of $MAPbBr_2Cl$ decreased than $MAPbBr_3$. This due to of

decreasing the values of V_{max} and J_{max} than the $MAPbBr_3$ perovskite and this because of the difference in the crystal size for these perovskites [22]. The J-V curve appeared near ohmic behavior which due to differ the work function between Ag and perovskites which can be enhancement by addition materials as hole transport materials like spiro-OMeTAD, and the preparation of perovskites under environment controlling of humidity .

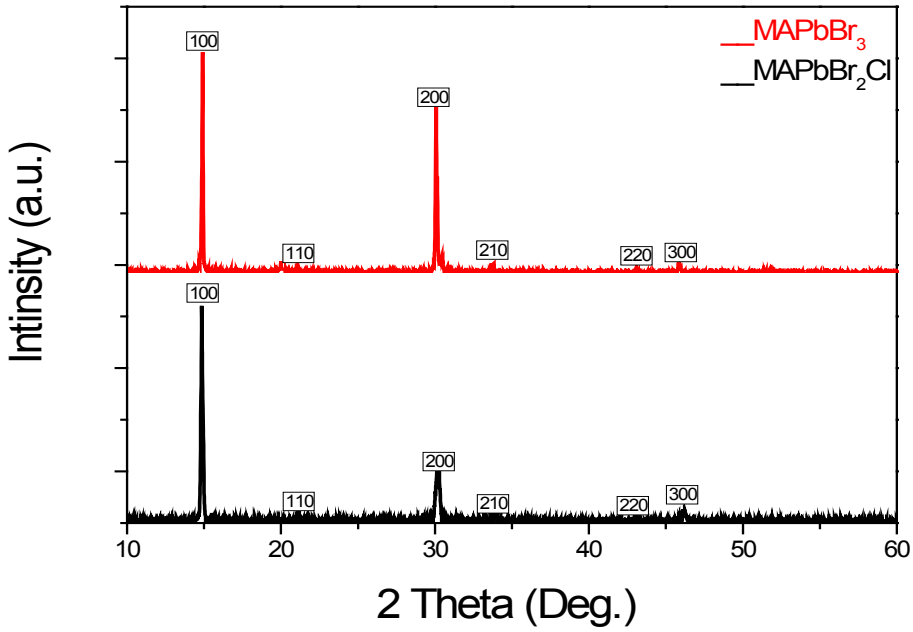

Figure 1. XRD pattern for the $MAPbBr_3$and $MAPbBr_2Cl$ perovskites

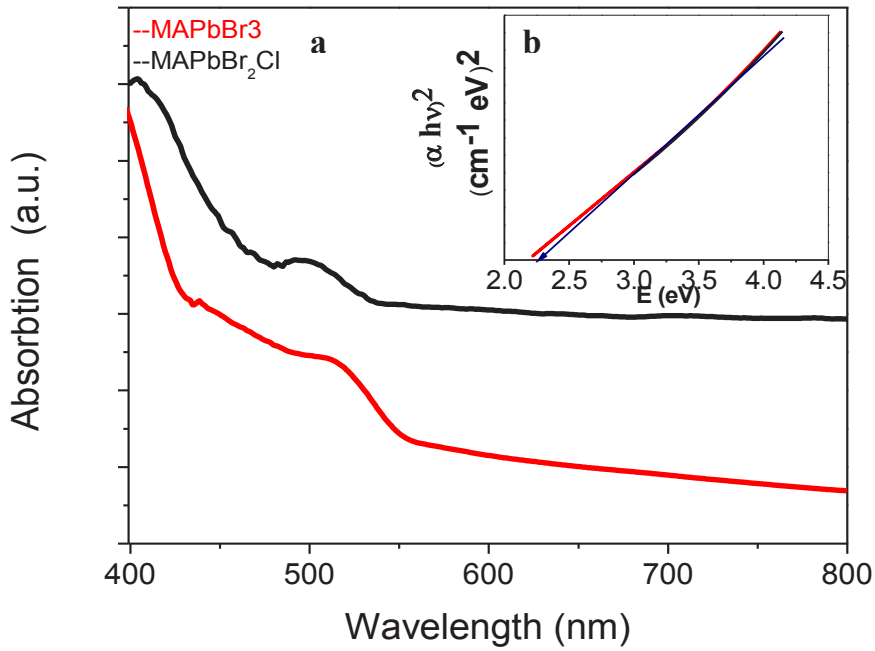

Figure 2(a). Absorbance spectrum to the $MAPbBr_3$and $MAPbBr_2Cl$ (b) The energy of bandgap.

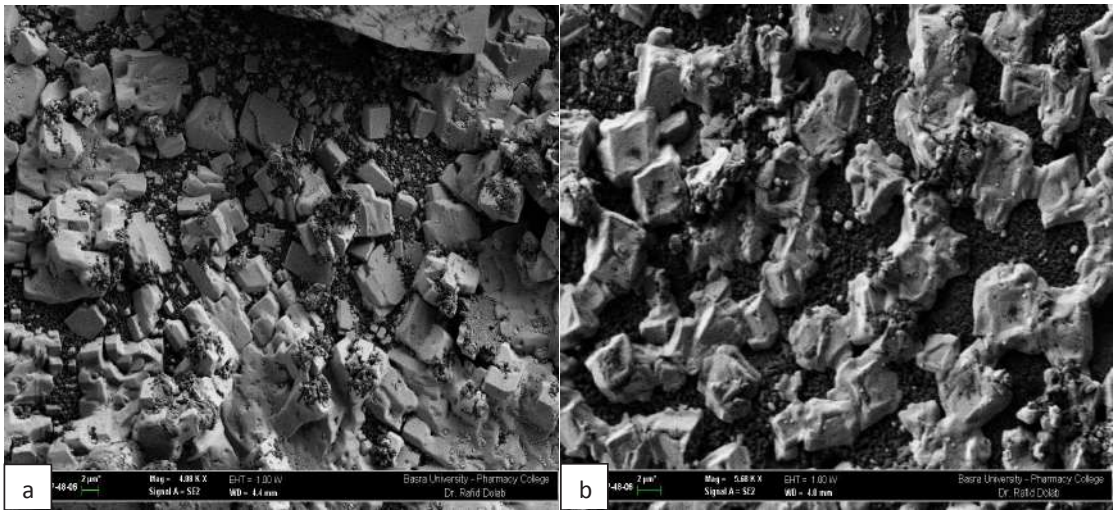

Figure 3. The images of FESEM (a) for $MAPbBr_3$ perovskite (b) $MAPbBr_2Cl$ perovskite

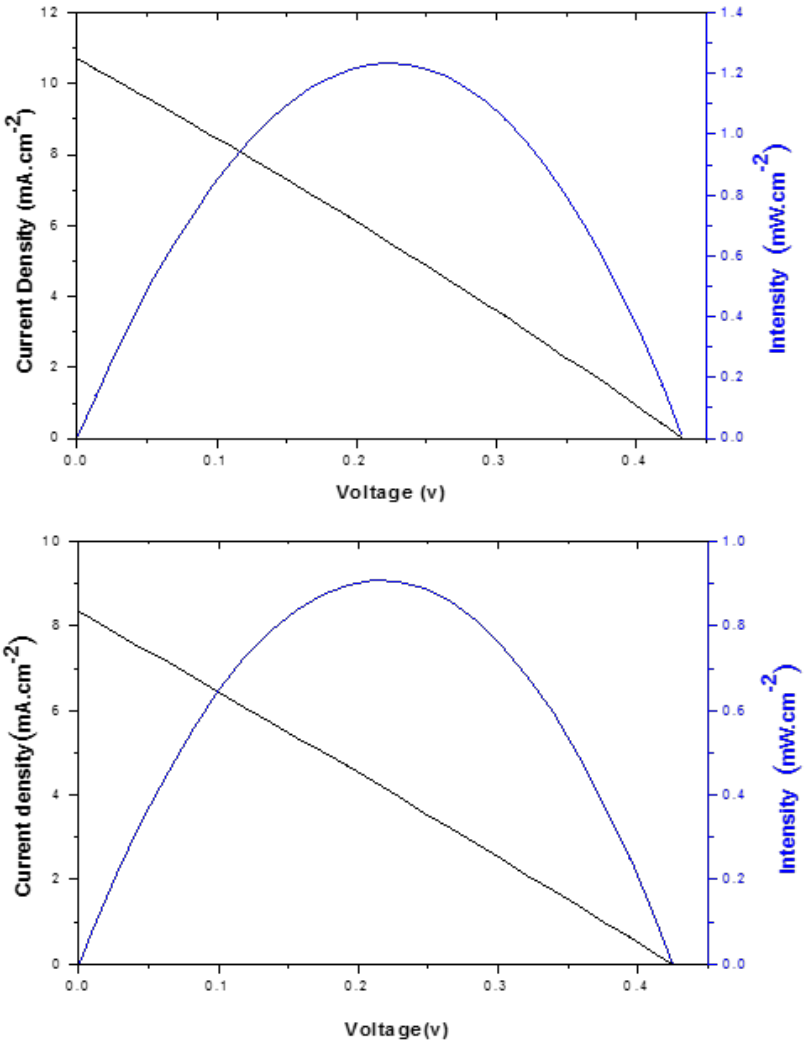

Figure 4. Shows J-V and intensitycharacteristic for $MAPbBr_3$and $MAPbBr_2Cl$ perovskite

CONCLUSION

The solar cells fabricated after prepared of two types organic-inorganic hybrid perovskites $MAPbBr_3$ and $MAPbBr_2Cl$. Changing in the ratio and kind of halogen Br and Cl, allowed to tuning the band gab of the perovskite. These solar cells have 1.23% and 0.9% power conversion efficiency *PCE* for $MAPbBr_3$ and $MAPbBr_2Cl$ perovskite respectively after illumination light equal 1.5 AM (100 $mWcm^{-2}$). The advantage of TiO_2 Nod as electron transport materials to increase the surface area of solar cell an addition it's used as a light harvesting.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Physics department, College of science, Basrah University, Basrah, Iraq and all experiments were carried out in accordance with approved guidelines.

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Improving an Illumination System in the Microscopic Imaging of Nuclear Tracks Using Light Emitting Diode

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ABSTRACT

In this study, images vision of nuclear tracks was increased using two methods. The first is to design a new light system based on Light-Emitting Diodes (LED) light instead of traditional fluorescent light used in the optical microscope. Due to the high dynamic range of the LED light, a high vision and an extra number of tracks were obtained during shooting. The second method is to establish a new scale depended on counting nuclear tracks. That is called No-Reference Image Quality Assessment Based on Wavelet Transform (NIQWT) scale. The quality of captured images was evaluated and no-reference scales like Entropy of First Derivative (EFD), Average Gradient (AG), the Measure of Enhancement by Entropy (EMEE), and (NIQWT) were calculated to be recommended. Then a good correlation coefficient was obtained for these scales. The best correlated coefficient 0.9032 was for (NIAWT) scale. Whereas, the statically results illustrated photography when using LED light much better than Florescent light in the optical microscopy. Therefore, these processes led to augment numbering of nuclear tracks discovered.

Keywords: *image quality assessment; nuclear tracks; CR-39 detector; LED light; wavelet domain.*

INTRODUCTION

Proper illumination is essential for optical microscope. Whereas in early years in candescent light was the only illumination. Today more specialized light sources, such as laser or arc lamp are being used. Due to the high efficiency and brightness of the LED, it has become a serious alternative to almost all types of illumination in the optical microscope. LED has high durability, no need for expensive electronics, and can be switched within a nanosecond. This makes them ideal sources of light when used instead of fluorescent in the optical microscope. The white color LED, which is between 2,600 and 5,000K, is an excellent choice for bright field illumination with the added advantage of simple brightness adjustments without changing the spectrum. This study discusses different types of LEDs, how they are used in fluorescence microscope, and how to use LED as specialized illumination source s for transmitting resonance energy and fluorescent lifetime imaging microscopy [1]. No-reference quantitative evaluation of image quality is one of the most pressing and difficult problems in image processing. Generalized contrast is the most important quantitative characteristic which can determine the objective quality of the image. The objective of study is the process of no reference measurements to assess the image quality of the nuclear tracks. The purpose of the work is to increase the number of nuclear tracks detected at different levels of lightness in the optical microscope using a light emitting diode source. Actually, a new development on the quality of the reference image using the NIQWT scale for the accurate of nuclear tracks is an urgent need in nuclear studies because augmenting the analysis image has led to an increase in the number of nuclear tracks detected. This will also improve the accuracy of nuclear measurements better than conventional method of manual sorting of nuclear tracks. In fact, these methods are able to improve SSNTDs applications, particularly when by image processing techniques [3]. In (2012), *Zylstra* et al. used analysis model to account the tracks in CR-39 detector [4]. Hussain A. Al-Jobori et al. measured track parameters using MATLAB [5]. A computer program named TRIAC

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I and TRIAC II was produced in MATLAB by Patiris et al. [6] to recognize the tracks and track parameters measurements from CR-39 solid state nuclear track detector images.

MATERIALS AND METHOD

This work has for the first time explored a new method of the enhancement of an illumination of optical microscopy in SSTNDs applications[7]. CR-39 track detector: Polyallyle diglycol carbonate - PADC which is generally referred as CR-39 is the most sensitive nuclear detector to record nuclear tracks. It was first discovered by Cartwright [8], and this detector consists of short polyallyle chains joined by links containing carbonate and die ethylene glycol groups into a dense three dimensional. The chemical form of CR-39 detector is . The properties of CR-39 detector[9]:

1. Amorphous polymer.
2. Optically clear.
3. Environmentally very stable.
4. Having non – solvent chemical etchant.
5. Highly cross – linked thermoset.
6. Sensitive to heavy ion damage.

Track formation mechanisms in dielectric media

When the cellulose nitrates can record α-particles (with certain energy depending on the etching condition) The CR-39 plastic can also exposed to thermal neutrons, which yield α-particles from the (n,α) reaction on the boron (or on the lithium)[10].The latent tracks can be etched with the help of a suitable etchant (often a simple alkali or acid, e.g. NAOH or FH), so that they become visible under an optical microscope,(with diameter of a (μm) or more).

Alpha Particle (nuclear track)

The alpha particles were emitted by Americium decay; impinge on a target, producing neutrons over a broad range of energies with an average energy 4.2MeV and a maximum 10MeV [11-13].

Light Source

Light is only one part of the various electromagnetic waves that fly through space. These waves contain frequency and length. Light values can be distinguished from other forms of energy on the electromagnetic spectrum. Light is emitted from a body due to Incandescence, Electric Discharge, Electro luminescence and Photoluminescence [14]. Images cannot be found without lighting.

Moreover, the general factors that effect on the light equality assessment have been determined.

Light Emitting Diode (LED)

The basic operating principle behind light emitting diodes LED is that inducing the conduction by negatively charged carriers (n-type) and some by positively charged carriers (p-type). When charged carriers of different types recombine, the released energy may be emitted as light [15]. LED lamps are the latest and newest addition to the list of energy efficient light sources. And that LED lamps emit visible light in a very narrow spectral band, they can produce “white light”. This is achieved either ~~a~~ by using a red-blue-green array or a phosphor-coated blue LED lamp, as well as its light decay is less than 10,000-hour testing. Although it is still in its infancy, the LED lighting techniques are rapidly and show promise for the future.

No- Reference Image Quality

The development of NR image quality measures is largely motivated by the fact that human beings can easily identify image quality without seeing a distortion-free image, and moreover, different individual observers tend to have similar image quality opinions. However, the HVS is enormously complex and current knowledge of the human visual perception is far from complete. In particular, there exists such factors like learning, visual context, and cognitive relevance in the human visual perception that can hardly be quantified. NR image quality assessment thus turns out to be an extremely difficult task. The field of NR image quality assessment has experienced fast advances in recent years and the number of new approaches that are being proposed is growing rapidly. At present, most existing NR image quality measures are designed with prior knowledge of the distortion. Fortunately, the distortion process is known in many applications, and the task of developing distortion-specific NR quality measures is of practical importance.

Image Quality Measurement (IQM)

Measuring image quality of image is a complex and difficult process because human opinion is influenced by

physical and psychological parameters. Many techniques are proposed to measure image quality but none are ideal for measuring quality. Hence, image quality assessment plays an important role in the field of image processing. Image quality metrics are divided in to two and objective types. Most IQMs are related to the difference between the two images (the original image and the distorted). This type is called reference IQM, while the other IQM is not related to the difference between the two images, such as the reduce reference IQM and the no reference IQM. Three no-reference scales are in use:

RESULTS AND DISCUSSION

There are two methods to improve the lighting system to shoot the nuclear tracks in the optical microscope:

$$c(u,d,T) = \int_0^T u \cdot \frac{1}{(4\pi Dt)^{\frac{2}{3}}} \cdot \exp(\frac{-d^2}{4Dt}) \quad (1)$$

where D is the diffusion coefficient of the communication medium. If more than one nanomachine diffuses a unit u molecules, a receiver nanomachine j accumulates the sensed molecules through the summation of the values of $c(u,d,T)$ over diffusing nanomachines i, i.e., nanomachine j senses molecules in total during the interval $[t, t+T]$

$$\sum_i c(u_i, d_{(i,j)}, T_i) - c(u_i, d_{(i,j)}, [T_i - T]_+) \quad (2)$$

where, $d_{(i,j)}$ is the distance between nanomachines i and j, T_i is the time that passed from the diffusion of nanomachine i up to time $t+T$, i.e., nanomachine i diffused at time $(t+T-T_i)$, u_i is the unit of molecules by nanomachine i at that time, and $[T_i - T]_+$ equals to $\max\{T_i - T, 0\}$. In other words, the receiver nanomachine senses the total amount of molecules that have been in its nearest proximity in the time interval $[t, t+T]$ without being able to distinguish which molecules come from which transmitter. If the amount of sensed molecules is greater than or equal to threshold τ, it will be considered as 1, otherwise it is 0. The curve of the function. In Figure 1, $c(u,d,T)$ (the detected molecules) is computed, which represents the peak of molecular concentration sensed by receiver nanomachines at d= 0.01, 0.5, and 1 from a transmitter nanomachine. The transmitter nanomachine is assumed to diffuse u=1 molecule, in a medium with diffusion coefficient D=10 cm^2/sec, initial value of time t=0 (the parameters values are based on an experiment in [12], the value of threshold is assumed to equal τ=0.5, through the experiment t is incremented by 0.01. The peak of the sensed molecular concentration is inversely proportional to the distance between transmitter and receiver nanomachines.

Time Slots Length

All the nanomachines n in the network are assumed to be synchronized, and can communicate in a predefined time slot T_0. Where T_0 is a system parameter and its length depends on the network's geometric properties, such that $T_0 = v\frac{d_{max}^2}{D}$, where v is a constant that can be equal 1; d_{max} is the transmission range distance of $node_c$, and D is the diffusion coefficient.

New Scale Called; No-Reference Image Quality-Assessment Based On Wavelet Transform (NIQWT)

Wavelet transforms are one of the most important and beneficial tools ~~of~~ for image processing .It has been used in image processing, data Compression and signal processing. in MATLAB program worked on the histogram for HL component for the original images means that discrete wavelet transform, there are only a limited number of wavelet coefficients for each bounded rectangular region in the upper half plan. Then the HL transform image histogram have been created. Finally the calculation of WBH which represent the inverted of a maximum histogram . This method is called No-reference quantitative assessment of image quality (NQWIT) which is one of the most pressing and difficult problems of image processing. This feature can the No-reference quality measure.

Microscopy Florescent Light changed by Light Emission Diode (LED)

Images with good lighting and contrast are of great importance in statistics and get a clear vision of the nuclear tracks. So image quality analysis is important for these tracks. This study determined the quality of the image that changes the light and contrast by controlling the level of light captured by the tracks images under the optical microscope. A new lighting system was used with the light emitting diode (LED) to generate different levels of lightness from (93)Lux to (1255)Lux as needed. In this work, the CR-39 detector was selected with a thickness of 500mm2 and an area of (1X1) cm2. It was exposed to the radioactive source for a period of 3 minutes and it was placed at 3.5 cm far from the detector. The chemical etching was then performed for 180 minutes, after which the tracks were dried. Video images were then taken at different illumination levels using LED light rather than fluorescent light.The light levels were measured by Lux meter device, with (HDEC-50B) camera size (3)µpixel ~~with~~ and zoom (40x) under optical microscope, see Figure (1). The aim of this work was to answer the question: What is the best level of illumination to capture the picture under the optical microscope? The answer is to propose a non-reference scale of images based on the number of nuclear tracks, as tabulated in Table 1. Then calculate the correlation coefficient for all images for different levels of lighting and for different non-reference scales such as (EFD, AG, EME, and NIQWT). At the light level (949)Lux, the highest correlation coefficient using the (NIQWT) scale was found depending on the counting of the tracks, which means that the detected nuclear tracks will be increased in this area. These results are described in table (2). Thus, different levels of lighting were applied that make the image with high quality as shown in the figure [3,4] which show that the use of no-reference NIQWT scale of correlation coefficient is better than other scales.

Table 1. Accounting of nuclear tracks for nine sets of images captured at different levels of lightness under the optical microscope

Intensity (LUX)	a	b	c	D	E	F	g	h	I
93	56	59	66	70	81	96	129	46	42
112	53	56	63	67	78	93	126	43	39
215	51	54	61	65	76	91	124	41	37
334	46	49	56	60	71	86	139	36	32
410	50	53	60	64	75	90	143	40	36
673	52	55	62	66	77	92	145	42	38
949	59	62	69	73	84	99	152	49	45
1238	65	68	77	79	90	105	158	55	51
1255	57	60	58	71	83	97	150	38	43

Table 2. Correlation coefficients for different No-Reference scales comparing with intensity of light

Intensity (LUX)	EFD	AG	EMEE	NIQWT
93	0.4204	0.6807	0.2155	0.8789
112	0.5509	0.3981	0.1741	0.6149
215	0.3423	0.2859	0.4103	0.0926
334	0.2033	0.2025	0.2837	0.2736
410	0.5434	0.5591	0.2835	0.6328
678	-0.0648	0.4765	0.1046	0.2418
949	0.4367	0.3510	0.2894	0.9032
1238	0.5516	0.5967	0.4121	0.6067
1255	0.6433	0.8794	0.4885	0.7870

CONCLUSION

In this work the distribution of lighting for LED source was used. LEDs have gained popularity in our homes and started to migrate to researchers and laboratories, with their ease of use, long lifetimes, and low waste; they will continue to take over the role of the traditional mercury arc lamp. Nine sets of images with different luminance were captured. New Quality scale (NIQWT) was used to calculate quality factor as well as other well-known standards (Entropy, average gradient, and EME) and the extraction of correlation coefficient with comparison of manually account for nuclear tracks for different levels lightness (93,112, 215, 334, 410, 678, 949, 1238, and 1255) LUX with their histogram. The best correlation coefficient to specify the intensity level for CR-39 detector to detect alpha particles was with best resolution for the tracks. Therefore, increasing of nuclear tracks found was due to the increase in an illumination (lightness) in which images are captured. This does not mean the necessarily of increasing in image quality. Thus, there are lighting levels that make the image having high quality which is (949) Lux.

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Social Psychology, Political and Scientific Situation of the Eighth Century AH the era of the Pride Investigators (Fakhr Al-Muhakikin)

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ABSTRACT

Social psychology uses scientific methods to study how people relate to each other. As such, many of its most basic and classic findings are relevant to civil politics. Hilla, is the city of science and scientists, which emerged many scholars and scientists, the beginning of the journey of Islamic sciences started in that era since it was established in 495 AH / 1101 AD, especially in the era of Mohammed bin Ahmed bin Idris Al Aajali, 598 AH / 1202 AD, who criticized the views of Sheikh Tusi that has turned the attentions to Hilla for four centuries, Hilla embraced the scientific schools many centuries. He gave many scholars, whether from Hilla or outside Hilla Ijazats, and most notably Mohammed bin Makki, who turned publishing the science of the people of the prophet's household outside and inside Hilla. He wrote a lot of books in the fundamentals of jurisprudence, theology and other sciences. The social status which lived in by Al-Allamma played a prominent role in Hilla and his father's great love for him and his relation to the Mughal Sultan led him to his killing, in which many scholars differed.

Keyword: *Psychology, Social, Scientific situation, Political*

INTRODUCTION

Social psychology is increasingly asked to solve the problems that civil society is facing. Major societal issues prompt fierce debates and each side tries to bolster their position by reference to scientific evidence and expertise. Social psychologists will praise the usefulness and the relevance of their theories to meet the demand of those fields [1]. It sometimes results in the same research appearing in different specialized journals – modified only to suit the conventions of that publication. If some theories are robust and have been empirically tested with success in different fields, others are more specific and can be transferred to a different field only artificially. Most of those fields are classic (health, education, law, work, organizations, etc) and usually form handbooks of applied social psychology, together with their methodological specifics. However, in addition to these traditional fields [2-3], there now appear more occasional fields, such as environment, economy and finance, media and new technologies, diversity, etc, which pertain to new social needs or preoccupations. This study shed light on the character of Mohammed bin Hassan al-Hilli (the pride of investigators), one of the flags of the eighth century AH, who was characterized and called (Zain Al-Mujtahideen) and knew his knowledge from his father. Mohammad Bin Al Hasan Al Hilli was a great man of high and high regard and raised in the house of his father (Allamma Al-Hilli), he was interested in teaching, completed his father's books in response to the commandment, he recommended and presided over his father's high school (Hilli school) after the death of his father. He was taught by his father and gave a lot of (Igeazats) [4], we shed lights on (Igazat of the pride of investigators) to scholars and jurists from home and abroad. This research is divided into an introduction and three topics [5]. The first deals with Hilla, the center of science, and the role of Al Hilli in this great city, who had the significant role of making (Khadbanda Muhammad), the Sultan of Mughal one of Islamic shia doctrine.

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METHODOLOGY

The second topic deals with the Shikhs of his teaching times, his birth and his children, and the political and social situations of the Islamic eighth century AH. And the third topic is about the (Igazat), dealing with his death and his writings as well. Finally, we hope that God Almighty has helped us to show this great personality in the Islamic and social history of Iraq in general terms and in Hilla city in particular. Hilla is one of the Iraqi rich cities in science, which was characterized by scientific status and appeared in the islamic scientific renaissance for several centuries and then increased the rise of thought by its founder Sadaqa Bin Maziad [1]. It was known as (Two Mosques), which today is one of the areas of the city, compared to the two mosques in which the prince of the faithful (Ali bin Abi Talib) prayed during his return from his battles in Safin and Nahrawan 36, 377 AH / 656 AD, 657 AD, he stayed there for forty-five days waiting for one of his army commanders, Abdul Aziz Al-Saray [2], who was wounded, after his arrival. Imam Ali washed him and buried him and the grave was still there. Al-Hamwi [(5)]said: Hilla is a large city located between Kufa and Baghdad and it was called (two mosques), the house of the sword of the state Sadaqah bin Dibis bin Ali bin Maysaid al-Asadi in Muharram (495 AH / 1101 AD) the first one who discovered and lived there , It was a refuge where the sepulchers were housed , He and his army were housed and built the beautiful and luxurious houses so it became a refuge for him and his people,because of that it became the most beautiful city, the merchants intended to come to the best city in the country of Iraq and the best life during (Saif Al Dawla) time. The first person who gave it the name so-called Hilla (Al saifya) is Al Imam Ali [6] and also visited by many travelers, including what Yadge said during his visit to Hilla in 1307 AH / 1890 AD: Hilla is the most urban and educated for the past centuries [(7)]. The city of Hilla was rectangular, located on the right side of the Euphrates river, extending along the river [1], A problem was based on occurrence of a critical predicament(the divorce of his wife) that he was very angry with his wife and divorces her illegally so he gathered on the necessity of the analysts opinions, who were disagreed by the Sultan divorce of his wife thinking that the divorce was legally, one of his ministers suggested him to reference to the Shia doctrine, which says the invalidity of this divorce and brought the scholars of the doctrine of Hilla in Iraq and rely on their opions, they attended with the scholar Al Hilli expressing the invalidity of the divorce for the condition of the requirement of two witnesses, discussions were held between Al Hilli and scientists and other doctrines violently, At last, Sultan Mohammed Khadabandh believed in Al- Shia doctrine [9],making the shia doctrine is the official one in the country. After the official declaration of Shiism by Khadbanda in all parts of the country, Hilli assigned the establishment of a "Moving school" equipped with all the equipment carried to the various regions in the Azerbaijan in summer and Baghdad in winter [4]. The activity of the intellectual movement in Hilla in the eighth century AH, and the role of scientists a prominent impact of the attention of scientists in the world to take from them sciences And they give them license , including the house of Al Alamma, which became the beacon of scientists and science, however , it was the exit of many scientists and scholars, including Alamma, which was intended to Hilla, Mr. Muhanna bin Sinan civil was the first who read his works in (717 AH) and Alamma Al Hilli praised in all his books and novels[(25)]. Mohammad Bin Al Hasan Al Hilli was his father's partner not only at the Al-(Halayyah school) but in the house of Al-'Allamma also[(27)]. Not only were the teaching houses, there were councils in Hilla, including the Council of Al-Hilli, the son of the Alamma, the teaching was issued after the death of the Allamma Al-Hilli his father and entered the council of a group of scientists (28). Ijazat It is an Arabic word means the permission that one person permits to another to narrate the speech, It has known as ((the words of the summary included the creation of permission in the narration of talk about him after telling him in general and the amounts of common and commonly known in his book this permission includes the mention of books and works. And to mention to the religious sheikhs of the authorized authority in the speech as well as mentioning the sheikhs opinions of each of these sheikhs in social and religious classes after another until the basic ending to the infallible people. His Ijazat (Sheikh Izz al-Din al-Hilli) Hassan bin Ahmed bin Muzaher Al-Hilli who has Ijazat from Muhamad Bin Alhassn Al Hilli in 741 AH, put him Sheikh Faqih Izz al-Din bin Muzaher and the first written on the copy (rules) and dated in (714 AH) (happy jurisprudence, Abi Abd Allah (Ahmad Bin Balko) bin Abi Talib bin Ali Sheikh Abu Abul Fotouh Al Owi for the Ijazat of the Allamma Al Hilli and about his son Muhammad 705 AH, Hassan bin Mohammed bin Ibrahim bin Sheikh Ezz

al - Din ibn Shams al - Din al - Damascene who has Ijazat of Mohammad Al Hilli 753 on the back of the rules, Imad al-Din al-Kashi, Hussein bin Mohammed bin Ahmed, the father of Sheikh Abi Saeed has three Ijazat from Mohammed Al Hilli (759 AH), Hamza bin Hamza bin Mohammed Nasser Al-Din Al-Alawi Al-Husseini is one of his students has Ijazat in the year 736 AH, Haidar bin Ali bin Haidar Al - Amali Husseini Al - Obaidly Sufi has two Ijazat of him in 759 AH and 761 AH, Abu Sa'id ibn al-Husayn ibn Muhammad ibn Ahmad al-Sheikh Taj al-Din al-Kashi has three Ijazat all in the year 759 AH, Abdul Karim Mohammed bin Ali bin Mohammed Al - Aaraj Al - Husseini Ghayath al - Din a student of Mohammed Al Hilli has it in the year 736 AH, Abdullah bin Muhammad bin Ali al-A'raj, who is Zia al-Din ibn Abd al-Din Muhi al-Din (Majd al-Din) Abi al-Fawares Muhammad ibn Ali al-Husseini, the younger brother of Amid al-Din (745 AH),and they were the sons of Al Allamma sister, Ali bin Hassan bin Ahmed bin Muzaher Zain al-Din AlHilli, the owner of the issues of demonstration and has two Ijazat in 741 AH and 755 AH, Mohammed bin Sadaqah Shams al-Din was one of the students of Mohammad Al Hilli his Ijazat in year 758 AH, Shams al-Din (Muhammad ibn Abi Talib) has IJazat in 750 AH, Nizam al-Din Muhammad ibn 'Ala ibn al-Hasan and his Ijazat from Mohammad Al Hilli in 757 AH, Muhammad bin Hilal al-Owi is Shams al-Din Abu Yusuf Muhammad bin Hilal ibn Abi Talib bin Haj Muhammad ibn al-Hasan ibn Muhammad al-Owe has Ijazat in 705 AH of Mohammad Al Hilli, Mahmoud bin Mohammed bin Ali bin Yusuf al-Tabari, which is Mohammed al-Akbar Badr al-Din Abu al-Mahasin a student of Al Allamma and the Mohammad AlHilli in the year 708 AH, Makki bin Mohammed bin Hamed bin Ahmed Jamal al-Din Abu Muhammad al-Amli, the father of Mohammed bin Makki (734-786) and had Ijazat by Mohammad Al Hilli in the year 751 AH, Muhanna bin Sinan bin Abdul Wahab has Ijazat from Him, Al Sayedf Amin Eddin Abu Talib Ahmed bin Zahra al-Husseini has Ijazat from Mohammed Al Hilli in 756 AH, Jamal al-Din al-Istrabadi: Shaykh Jamal al-Din was a full-fledged figure. He was referred by Sheikh Abdul Muttalib bin Fakhr Abdul-Muttalib al-Khuzaie as a student by Mohammad Al Hilli and his father(Alamma), and had given Ijazat,he has studied Sheikh Al-Ahli global Ijazat with (khat al fakhr), Jamal al-Din al-Istrabadi: Shaykh Jamal al-Din was a complete fad. He was referred to by Sheikh Abdul Muttalib bin Fakhr Abdul-Muttalib al-Khuzaie as a student by Al Allamma and his son, Sheikh Mohammed bin Mohammed Al-Esfandiari Amaly: Mohammad Al Hilli gave Sheikh Mohammed al-Esfandiari approved a copy of the book of Al-Murad in the explanation of the disqualification of the belief of Al-Alamma in 745 AH and then read on to His son Mohammad, Sheikh Abu al-Muzaffar Yahya bin Sheikh Fakhr Al Muhakikin (Mohammed Al Hilli): Abu al-Muzaffar Yahya bin al-Sheikh wrote a variety of classifications of his grandfather Al-Hilli, including a summary of words written by his father and his father gave him Ijazat and other Ijazats, Izz al-Din Hassan bin Qasim bin Bulbul (alive 730 AH) : The student of Mohammad Al Hilli and authorized him by saying (I have given Sheikh Faqih virtuous religious Hassan Bin Qasim bin Bulbul bin Kuttab editorial full Ijazat), Ibrahim bin Ali bin al-Hussein al-Turaihi 724 AH: one of his students, he had Ijazat in 717 AH, Ali bin Hassan Al-Sarabashnawi Al Hilli: He had Ijazat from Mohammad in (751 AH). His Works: The works of Mohammed bin Hassan al-Hilli (Fakhr Al muhakikin): Some of his work has not written yet, so next we will present most of his works: Tahseel Al Najat, Izah Al Foa'd fi Sharh Mushkilat Al Quaed =Izah Al Quaed, Jamie Alfawayid Fi Sharah Khutbat Alqawaed, Iirshad Almustarshidin Wahidayat Altaalibayn = Wajib Alaietiqad, Haashiat 'Iirshad Al'adhhan, Alhashiat Ealaa 'Anwar Almalkut Fi Sharah Alyaqut, Thlatht Wa'arbaeun Hdythana Nbwyana, Mueraj Alyaqin Fi Sharah Nahj Almustrshdin, Alfkhrya Fi Maerifat Alnya, Ghayat Alsuwuwl Fi Sharah Tahdhib Alwusul 'Iilaa Eilm Al'usul, Aleaqayid Alfkhryt = Eaqayid Fakhar Aldiyn = Alaietiqadat, Sharah Alfusul Alnsyrya, Alnakt Alaetqadyt = Alrisalat Aljwabya = Almasayil Waljawabat = Alfkhrya Fi Aleaqayd, Alkhilasat Fi 'Usul Aldiyn Waleaqayid, Al Hag, Alkafiya Alwafiya Fi Alkalam, Nihayat Almamul Fi Sharah Mabadi Alwasul, Nihayat Alhal Fi 'Usul Alfaqih, Dawazidh 'Iimama, Wajibat Alslaat, Almasayil Alamlyat = Alhydryt = Al'asyilat Alamly, Almasayil Alnasryat, Almasayil Almzahryat = Alhawashiu Alfkhrya = Jawab Masayil Abn Mazahir, Almasayil Alfqhy, Almasayil Wal'ajuba, Masayil Suyl Eanha Fi Eilm Alkalam, Almasayil Alfkhrya, Wlellha Bieiniha Almasayil Almhnnaya, Ujubat Almasayil Almhnnaya = Almdnya, Ujubat Almasayil Alfqhy, Ujubat Masayil Fqhyat Libaed Alajila, Iijabat Masayil Alsyid Eala' Aldiyn Ely Bin Zahrt. Al-Qami said that the first person who had visited the grave of him said ((The owner of this grave must transfer, it was quoted by his father and then he mentioned the story of the one who visited the grave of his faithful

brother. Abdullah al-Mumqani said otherwise: "I did not stand on the spot of his burial place, which was transmitted by the sheikhs. His body has become unsafe for the cause of mobility, which is not advisable to transfer "[90]. It had been known about father's love for him which his father called him the pride of investigators (Fakhr Al muhakikin) and the pride of religion (Fakhr Al dien).As well as his closeness to the Mughal Sultan and his knowledge and sciences. He was killed on Friday the fifteenth of Jumadi al-Akhra in 771 AH at the age of 89 years.

CONCLUSION

Political psychology applies what is known about human psychology to the study of political behavior, focusing on individuals within a specific political system. Topics such as terrorism, public support for fascism, and ethnocentrism are commonly studied within political psychology to gain better traction on the perennial question of how well citizens are equipped to handle their democratic responsibilities. The scholars of Hilla, especially the family of (Al-Mutaher) AL Allamma Al Hilli and his son, Fakhr Al Muhakikin (the pride of investigators) has a prominent influence in the social and political life of the rule of the Mongols, especially in the era of Muhammad (Khadbanda). Al-Hali and his son who accompanied his father Al-Hasan bin Yusuf bin al-Mutahar in his travels has founded the school in publishing the sciences of the prophet's household people. Muhammad ibn al-Hasan al-Hilli was headed in 771 AH after the death of his father the leadership of science teaching after his father. He completed and wrote his father's books, who recommended that to complete them according to his father's will. He gave many scholars, whether from Hilla or outside Hilla Ijazats, and most notably Mohammed bin Makki, who turned publishing the science of the people of the prophet's household outside and inside Hilla. He wrote a lot of books in the fundamentals of jurisprudence, theology and other sciences.The social status which lived in by Al-Allamma played a prominent role in Hilla and his father's great love for him and his relation to the Mughal Sultan led him to his killing, in which many scholars differed. The family of Al Mutahr presented to the city of Hilla and the Islamic cities many scholars and scientists with a lot of sciences.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Education for Human Sciences, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Effectiveness of the Theory of Expansion in the Development of Mental Skills among Students

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ABSTRACT

The objectives of the current research are to identify the effectiveness of the expansionary theory in the development of mental skills among Fourth Grade students at the Faculty of Education for Human Sciences / Babylon University during the Academic Year2017-2018. To achieve the research objectives, the researchers formulate the following hypotheses: The first hypothesis: There are no statistically significant differences at the level of significance (0.05) between the grades of the experimental and control groups in the performance of mental skills as a whole in the specified level of the questionnaire. The second hypothesis: There are no statistically significant differences at the level of significance (0.05) between the scores of the control group students in the pre-test and post-mental skills.The researchers adopted the experimental method, which has the ability to control the various factors affecting the phenomenon to be studied. The community of the study consists of (506) students, divided into (6) sections. The researchers conducted the pre-test of the sample and then their main experiment on the research sample, A curriculum based on the theory of expansion and then conducted the tests of dimension to be then processed statistically by (SPSS) program.

Keyword: *Development, Mental Skills, Effectiveness*

INTRODUCTION

The teacher preparation is one of the issues that has been and continues to occupy a large area of educational thought, and although it is one of the traditional issues, it is soon to put forward a new proposal with every development or change in dimension of the educational system, On the other hand, the success of development processes depends on the other hand. The teacher is the most important element in the educational process and its basic focus. It is the effective human element, which is the burden of the numbers and upbringing of the younger generations and giving them the basic qualities that are right and the direct responsibility for achieving the educational goals. , The efficiency of the educational system depends primarily on the efficiency and good preparation of the teacher [1-3] . If the student can implement a mental skill successful implementation of time, it means that he has the mental capacity to achieve this whenever he tried, but may be missed because his mind interferes improperly and spoils this mental and mental compatibility and reinforcement and can be demonstrated through the similarity of the process of developing the mental skill of students skills development process In technical development we show each one of them the most efficient techniques in the performance of special skill with advice on the use and with the improvement of students adapts this classical method commensurate with the body style and strength and length of the parties and the personality of the student. Al-Qatami (2011) confirms that the gradation of simple ideas to the most difficult described by the extended model helps to ensure that the learner is always aware of the educational context and the importance of different ideas being taught and allows him to learn the most appropriate level of difficulty, That ideas are not learned before their previous requirements are met and that it integrates the hierarchy with the overall structure of the extended sequence, as well as describing the use of parts of the strategies including learning sequential requirements at different points during the teaching

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process [4]. In the light of what is mentioned above, it has been found that teachers in the Faculty of Education of Human Sciences, to keep pace with the modern scientific development research found the of the theory of expansion effective of the (Rijloth) in the development of mental skills of the students identified the problem of research in the question: The Effectiveness of Raigloth's Expanding Theory on Developing Mental Skills in Students. Education occupies an important place in societies progress, because it aims at bringing about changes in human behavior, developing personality and directing people towards the service of their society. This process leads to a comprehensive change in the individual's intellectual, emotional and performance behavior from the very beginning of life till the end of it [5-7]. Through their curricula, faculties of Education are tackled in three basic aspects : the academic ,the professional and cultural aspect, including the academic specialization materials that the student will teach in the future in the primary , secondary schools, and the professional side which is composed of two elements: facts and information related to the teaching profession, scientific and practical skills that enable him to apply facts and information and to help his students to complete their growth. These two elements are inseparable. They overlap and each complements the master's skill in teaching methods and educational materials .It is natural for a teacher to be successful when mastering the specialization materials, and vice versa i.e., whatever mastered of the specialization materials will help the teacher to be able to connect fully to his students .He will not be able to play his role as education professional without mastering the skills and methods of teaching and other educational materials [9,10]. Building a professional teacher is considered one of the most important basics of enabling his student to achieve the mastery and the desired goals that designed and planned by professionals in education to meet the challenges of comprehensive progress in light of the scientific, technological, social and economic changes of contemporary societies. Due to the importance of teacher preparation, there has been developed systems and teaching methods and programs in Colleges of Education locally and globally so as to raise the faculties outputs of the Faculties of Education and to cope with current scientific and technological developments [11]. The expansionist theory is one of the modern theories that researchers in Education attempt to use to understand educational phenomena in their multiple overlapping dimensions. The systemic approach relies on the so-called system, which essentially means a set of objects that have been grouped together in a field with their interacting relationships to achieve specific goals. Thus, the Education researchers feel there is an urgent need to adopt the systemic approach so that they can pursue the complex nature of the educational problems that are affected by an interactive set of different variables [12]. The theory of expansion is one of the useful means in organizing the American curriculum: elementary, preparatory, secondary and university taking into account the level of difficulty at each stage. It is based on the logical sequence from general to specific and from abstract to the concrete, with details of the content of the curriculum to several stages followed by the summary, synthesis and conclusion stages. It was called the expansionist theory because it deals with the content of the teaching material at the extended level. It deals with the organization of a set of general concepts, principles or procedures that are included in a curriculum unit, or a course of study taught throughout a month, semester or year. The expansionist theory aims at finding a set of codified formulas that depict the content of the curriculum and organize it in a logical sequence that starts from the general to the specific and will help to construct a knowledge-based cognitive structure. This arrangement gives a general idea and then gradually separates it. The overall introduction is followed by a detailed description of the contents of this introduction horizontally or vertically in several stages, depending on the number of stages of detail on the size and level of difficulty of the content of the course material.

METHODOLOGY

In order to achieve the objectives of this research, the researchers adopted the experimental approach which is a control of the variables and their control in experimental situations. The experimental method is characterized by the ability to control the various factors affecting the phenomenon to be studied.

Research community and Samples

Research Community refers to all individuals or objects with certain observable characteristics. The only test of society is the existence of a common property among its members, and the characteristics of the society that can be observed are "milestones of society". The research community consists of the Fourth Grade students in the Faculty of Education for Human Sciences

/ Babel for the Academic Year (2017-2018). They are (506) students.

Research Sample

The sample is a subset of a community with common characteristics, the purpose of which is to generalize the results from a larger community (Abu Hwij, 2002: 45). Researchers choose the intentional method.

Research Communities Parity

The researchers statistically paired between the two groups of research (experimental and control) statistically before the start of the program in some variables that iare believed to affect the safety of the experiment and the accuracy of results. These variables are:

A) Pre-test scores (for mental skills).

b) Mental capacity.

C) The time period calculated in months.

H. Test scores of mental skills.

The researchers obtained data on the dependent variable after applying a pretest prepared to measure the previous intelligence information.

Measuring Tool

To avoid the effect of this variable, the two researchers used the two sets of research (pre-post test) of the mental skills scale: the mental skills questionnaire is used to identify strengths and weaknesses and to follow their progress. The questionnaire is an adopted one which designed by two British psychologists - University of North Wales.

The questionnaire measures seven important aspects of the mental side:

1- The ability to imagine.

2 - Mental preparation.

3. Self-confidence.

4 - Dealing with anxiety.

5. Ability to focus.

6. The ability to relax.

7. Motivation.

The researchers have built an objective test according to the type of importance, since this type of test has many positives like its comprehensiveness and objectivity (truthfulness and consistency), as well as the ease of correction and lack of guessing effect. It is also more exciting and interesting for the student taking no long time to perform. The test paragraphs were derived by examining a number of literature in the curricula and teaching methods, writings related to mental skills, and extrapolating previous research and studies in the field of mental skills development.

Selection of Experimental Design

The experimental design means conducting a basic structure of an experiment, including the description of the groups that comprise the experiment members and the identification of the ways in which the sample is selected). Therefore, the researchers should choose an appropriate experimental design before conducting the experiment in order to test the validity of the results, noting that the educational experimental research did not arrive at a perfect experimental design of the control, and the control process remains partial because of the difficulty of controlling all the variables in the educational phenomenon. Since there are several experimental designs, the researchers chose a design suitable for the nature of the problem in their research. This is the preetest-posttest design. This design is illustrated in Table (1).

RESULTS AND DISCUSSION

Results related to the first main hypothesis

The first major hypothesis is that "there were no statistically significant differences at the level of significance (0.05) between the scores of the experimental and control groups in the performance of mental skills. In order to verify this hypothesis, researchers use the Mann-Whitney test. It appears that there is a statistically significant difference for the benefit of the experimental group. The calculated Mann-Whitney value is smaller than the tabular value at (0.05) Table (2).

Results related to the second hypothesis

The second main hypothesis is that "there were no statistically significant differences at the level of significance (0.05) between the scores of the control group students in the tribal and remote tests. To

investigate this hypothesis, the researchers use the Wilcoxon test. The calculated value of the appears to be greater than the tabular value at the significance level (0.05). Therefore, the null hypothesis is accepted. There is no statistically significant differences between the pre and posttests of the mental skills of the control group Table (3) .

Effectiveness Ratio

To determine the ratio of the effectiveness of the independent variable (the training program) in the dependent variable (the mental skill scale, the theoretical aspect), the researchers applied the equation of MacGujian. The efficiency ratio appears to be 0.83. This indicates that the program is effective since scales denote that it should not exceed (0.60). To verify effectiveness, and if this is less, the program is ineffective (Roebuck, 1973-472-473).

Table 1. The number of the Fourth Grade students in the Faculty of Education for Human Sciences / Babel.

No.	Department	Male	Female	total
1	Mathematics	22	99	121
2	English	14	76	81
3	Physics	21	69	90
4	Biology	26	71	97
5	Chemistry	16	31	47
6	Computer Sciences	24	46	70
total		123	383	506

Table 2. Results of the Mann-Whitney test to determine the differences between the experimental and control groups In the overall performance of the skills as measured by the observation form.

Group	Number of community	Means of rank	Rank total	Mann Whitney Value		Statistical significance 0.05
Experimental	12	16.67	200.00	tabular	calculated	significant difference
control	12	8.33	100.00	37	22	

Table 3. Results of the Wilkinson test to find out the differences between pre and post application to measure the mental skills on the control group.

Group	tests	No.of community	Means of Rank	Wilcoxon Value		Statistical significance 0.05
Experimental	post	12	3.00	tabular	calculated	No significant difference
control	pre	12	4.75	14	19	

CONCLUSION

The interactive guide is effective in developing the mental skills of students / teachers. The highest level of mental skills was the ability to imagine first and then the other skills. They are (self-confidence - the ability to relax - motivation - the ability to focus and finally, the skill of dealing with anxiety) respectively.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon/ Faculty of Basic Education, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Impact of the Clustering Strategy in the Acquisition of Students in Junior High in Grammar Arabic

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ABSTRACT

The aim of this study was to know the effect of the clustering strategy on achievement. The experimental method was adopted as a methodology for conducting research, which included an independent variable (the clustering e strategy, the usual method) and a dependent variable. And the objective of the following variables (age of time calculated months, first grade grades in the rules, educational achievement of parents, test the previous parameters), the researcher to prepare the application requirements of plans, objectives and tests for the research groups, and after the violation After applying the experiment, the researcher applied the research tools to the two research groups. After correcting the students' answers, each student obtained data for the experimental group and the control. The data were statistically processed by the independent testing of two independent samples, and showed that the experimental group according to the clustering strategy exceeded the control group which were studied in the usual way in the variable scholastic achievement.

Keywords: *Clustering Strategy, Learning Achievement.*

INTRODUCTION

The development of the year of life, and the interaction with this development is required, and the world today is witnessing remarkable progress in all areas. The nations and societies are characterized by the knowledge, science and wealth of an educated human being capable of reviving themselves through their abilities to form their future, Therefore, the educational renaissance has to retreat from time to time and return to the fields of self-criticism in order to get what is most valuable in the development of the educational process. And the educational process tracker Found that there has been a remarkable shift in the last quarter of the twentieth century to studies on learning and education, after the psychologists and education focused on the principles of behavioral theory in their interpretation of the processes of learning and education became in the early seventies focus on the principles of theories (constructivism cognitive) [1] Behavioral theory interprets the process of learning as measurable observation responses, reinforced by practice and reinforcement, while cognitive constructivism views this process as internal mental processes expressed by the learner's ability to visualize, understand, absorb, retrieve, and use the information presented in similar situations [2]. that is, knowledge is driven in the mind by mental processes and that the structure of the total mind is constantly working to reorganize the cognitive pattern of the learner where the out put is permanently renewed subject to representation and adaptation influenced mainly by the positive Science and its effectiveness and experience and its unique characteristics, which make the learning process always dynamic process active does not stop at a particular moment and make the mind renew a member at every moment, changing the contents and structure of the time and place and environment elements surrounding the recipient that is the philosophy of constructive structure Antistatic stability, and integrative processes in return for dependence on the linear analytical mind, and positive by the learner. It is certain that the educational process can achieve its objectives in society only by means of communication through which scientific educational systems can be applied, namely,

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the language [3]. Therefore, each of the languages of the world must have rules and standards of language specific to their language, which will organize the language and make it understandable and easy to trade between their sons, without these controls and standards required by the nature of the Arabic language and the treatment of speakers is necessary was impossible to reach the meaning to the mind of the listener Or reader correctly and Understandable. Therefore, the grammars have an importance and a preference for the language, which is the balance of evaluating its validity, its pillars, the axis of its linguistic systems, and the wall that protects the Holy Quran and Sunnah from any attempt. The researcher believes that today we need to codify our science and ideas in Arabic language free of grammatical mistakes of the past and present in the future, and this will be achieved only by learning the rules of the Arabic language. Therefore, the researchers are interested in developing operational strategies followed by the teacher within the class, which is based on the theories of cognitive structure, which emphasizes the student's focus on the learning process without ignoring the role of the teacher as a key to the success of the educational process. Therefore, the educational system becomes more positive when concentrated on a group recent strategies such as self-learning strategy, problem-solving strategy, mental mapping, selective learning, exploratory learning, Active learning strategies, and clustering strategy are one of the Active learning strategies. A special structure is designed to influence the student interaction pattern and aims to improve the mastery of educational outcomes by engaging students in reviewing the covered materials for the lesson and achieving understanding of the content of the lesson. It is a sophisticated structure for students to help each other in small clusters, students seek to achieve a meaningful output for them and for members The students feel that each one of them has a specific responsibility and each one has a specific role to play in order to integrate the work of the whole group, so they become responsible for teaching each other as an alternative to traditional structures such as raising hands and then appointing a student teacher To answer the questions raised.

METHODOLOGY

It includes a presentation of the procedures followed to achieve the objectives of this research in terms of adoption of appropriate research methodology, design appropriate, the research community, the method of sample selection and methods of equivalence of the two groups, and a description of the search requirements, tools and how to apply them and the statistical means used in data processing.

Experimental Design

Since the aim of the research was to identify the effect of teaching on the clustering strategy as an independent variable in the student achievement as a dependent variable, the researcher adopted the experimental design with partial control in two equal groups experimental study.

Research community

The current research community includes fourth grade students of all schools (secondary and preparatory) of the governmental day of the Directorate General of Education in the center of the province of Babylon for the academic year (2017-2018(

The research sample

The researcher chose the random sample of the study. It consisted of a school in the governorate center containing four divisions. Two random groups were also chosen to represent the experimental group and the control group. To achieve the objectives of the study, as in Table (1). The researcher ruled out students who failed because they had previous educational experience in the subjects that will be studied during the experiment. This affects the accuracy of the results of the experiment, although the researcher excluded them from the results only

Equal search groups before the actual teaching, the researcher carried out the equivalence of the students of the two research groups statistically in a number of variables that may affect the safety of the experiment and the accuracy of its results, as follows:

The age of the students calculated in months, the Educational achievement of the parents, the Educational achievement of the mothers, the grades of the students in the first semester of the Educational year 2017/2018 in the rule of the Arabic language

Control of the exotic variables Despite the parity procedures carried out by the researcher between the two research groups, Avoidance of the effect of some extraneous variables in the confidentiality of the

experiment, and then in the results. Here are some of these variables and how to control them .Before the actual teaching, the researcher carried out the equivalence of the students of the two research groups statistically in a number of variables that may affect the safety of the experiment and the accuracy of its results, as follows: The age of the students calculated in months, the Educational achievement of the parents, the Educational achievement of the mothers, the grades of the students in the first semester of the Educational year 2017/2018 in the rule of the Arabic language.

Control of the exotic variables Despite the parity procedures carried out by the researcher between the two research groups, Avoidance of the effect of some extraneous variables in the confidentiality of the experiment, and then in the results. Here are some of these variables and how to control them Experimental extinction: - There was no interruption of the students of the two groups of current research throughout the Experience period.

Conditions and associated accidents: Some experiments may be subjected to natural or abnormal events during the experiment, causing the experiment to be blocked and have an effect on the dependent variable next to the independent variable.

Sample Selection: Randomly selected and the two groups were checked.

The process of maturity: This factor had no significant effect in the current research, because the duration of the experiment was unified between the two research groups, as well as experimental design adopted by the researcher experimental design with partial adjustment, and on this basis, the resulting maturity and growth will return to students of my group search.

The impact of experimental procedures: The researcher worked to limit The impact of experimental procedures that can affect the dependent variable during the course of the experiment.

Preparation of research materials The research materials are basic and according to which the research procedures are carried out, which is: The educational material: The teaching material that the researcher is teaching has been determined for the students of the research groups during the period of the experiment (the second semester) of the academic year (2017-2018) The first seven topics of grammar in the book of Arabic language (Part II) to be taught to students of the fourth.

Behavioral objectives the researcher formulated 68 goals in light of the general objectives and the content of the subject to be taught during the duration of the experiment. The researcher presented a list of behavioral objectives on the five levels of knowledge in the Bloom classification (recall, understanding, application, analysis, A selection of experts and specialists in the language and methods of teaching, and in the educational sciences to take their views and suggestions regarding the soundness of the formulation of the objectives and the extent to which the subjects of the content of the study covered by the experience,

Preparation of teaching plans: The researcher prepared a set of teaching plans for the experimental and control groups in the light of the topics of the book. The number of teaching plans (7) plans for the experimental group according to the clustering strategy and the same for the control group according to the usual method.

Research Tools: The current research requirements include the existence of a standardized tool to measure the achievement of intermediate second grade students in the Arabic Grammar for the experimental and control groups. Therefore, the researchers prepared a collection test consisting of (30)

The truth of the test: The researcher was keen to be a true instrument, and to achieve the objectives of the research so used two types of honesty: apparent honesty and trueness content The results showed that the apparent honesty obtained the percentage of agreement (80%) by the arbitrators and specialists. As for the validity of the content, the results showed that all the paragraphs of the test are statistically significant

Stability of the test: Midterm fragmentation: The researcher used the Pearson correlation coefficient to extract the coefficient of correlation between the individual and marital points of the test and was corrected by the Spearman-Brown formula. To calculate stability in this method, the researcher adopted the sample of the survey sample which reached (100) (0.86) and then corrected by Spearman-Brown equation (0.93).

Application of the achievement test before the end of the experiment a week, the researcher told the students of the research groups that there was a test for

them in the seven subjects that were studied for them. The researcher supervised with the Arabic language school the course of the test and the researcher explained how to answer the test paragraphs before the students began to answer

Statistical means

The researcher used the end-tailed(T-Test) for two independent samples: The researcher used the end-tit test for two independent samples in the equivalence between the experimental and control groups in the following variables: (the age of the students, the grades of Arabic grammar in the half year of the current year, and the final achievement test).

RESULTS AND DISCUSSION

The hypothesis of the research: "There is no statistically significant difference at the level of (0.05) between the average achievement of students of the experimental group who study the Arabic grammar using the clustering strategy, and the average score of students of the control group who study the same material in the usual way. To examine the hypothesis of the research, the statistical averages and the standard deviations of the scores of the two groups were extracted in the post-achievement test in the Arabic grammar, and the results of the T-Test were extracted to detect the significance of the differences between the averages, between the experimental and control groups on the post-achievement test in the Arabic grammar and by reference to the arithmetic averages, it is noted that these differences are in favor of the experimental group. In this way, we reject the null hypothesis and accept the alternative hypothesis, which means that the clustering strategy positively affects student achievement.

CONCLUSION

After correcting the students' answers, each student obtained data for the experimental group and the control. The data were statistically processed by the independent testing of two independent samples, and showed that the experimental group according to the clustering strategy exceeded the control group which were studied in the usual way in the variable scholastic achievement.

Financial disclosure

There is no financial disclosure.

Conflict of interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Methods of Teaching Arabic Language**,** Faculty of Basic Education, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Training Effect on Listening Skills in the Pupils' Achievement with Learning Difficulties in Reading

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ABSTRACT

The research aims to identify the scope of that pupils have in learning difficulties for listening skills and improve these skills by training them on it , through an organized training program, the sample was chosen from the pupils of special education in the fourth class of primary, the sample of the research has made up of (12) pupils (masculine and feminine), the researcher used a questionnaire that was presented to the arbitrators to identify the listening skills which has required for the pupils in the research sample. The test of listening skills is used to identify the scope to which these pupils' possess of these skills. The researcher used the suitable statistical methods such as percentages and (w) test , the results of research reached to put a list contains all the listening skills required, the results of the research refers to a low level of the sample in all the listening skills required especially the organization of ideas skill as it presented in the audible text.

Keywords: *Training Effect, Skills, Pupils*

INTRODUCTION

Training is a modern and effective method to improve and develop any of the different life fields, whether in the personal , academic, financial, practical, family, health, or any other fields it takes a central position in the world as an important and effective method to achieve the aims by dividing it into tasks or small skills, then it refers to the achievement of knowledge and skill, proficiencies as a result of vocational education, or theoretical skills and knowledge that relate to specific useful proficiencies that forms the essence of apprenticeship, the training aims to change behavior and attitudes then develop skills and information especially the managerial behavioral skills in order to prepare pupils for the professional future and develop attitudes , understanding and the ability to solve problems , decision making, innovation, communication, listening art and negotiation , The listening skill needs training to develop in the individual , Economics and philosophies interested in the language, then there is no a doubt that the language form the minds of the nation and guide its thinking and build it, and prepare for the linguistic activity what drives to and reduces the hard of life. [1] Training and human development activity have increased significantly over the past few decades according to Volmer (1988) , more than 40 billion dollars a year is spent on human resources development [11] , In education, teaching and learning requires Teachers turn the educational task into a reality, and as they admit (effective teachers and lecturers are usually responsible for introducing new learning concepts which demonstrate methods of thinking). [12] Most of specialists and practitioners agree with each other that training is organized and planned process according to a specific methodology based on sound scientific foundations. Commitment is therefore necessary for this methodology if wanted to training programs to achieve the expected aims. The design of the training programs is represented a main stage in the methodology of training process, lots of researchers refer to that the design of effective training programs isn't done only in through a scientific assessment of the actual training needs of the participants in these programs. So preparing the training program aims, the determine its content, its subjects, its activities, effectives, diagnosed the suitable training methods, identification of other inputs required by the implementation process and dependent on the assessment of the training needs to.[7] The importance of

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impact moving of training is that the training remains rigid and specific if it isn't move from one educational level to another. We learn to employ what we have learned in our applied life or use in facilitating learning of another kind, The concept of impact transmission is a behavioral phenomenon that's not occur spontaneously, but occurs according to objective and subjective terms. If these conditions be available, it will be easy to transform. [6] Transition is the process that makes the use of previous education in new situations or the use of this learning to acquire another new learning, or it precedes future performance in a new situation, or the process of using something that a person has learned in another situation [3]. Listening is considered a linguistic art or main condition for the intellectual development , so this art is careless in our approaches especially in the Arabic countries, this is due to the lack of understanding of the listening process nature as well as its importance, the perception still that the skills development is limited to making the pupils read aloud of the open book in front of his/her classmates only to the limit that made the pupils lack of this skills and the clear lack of gotten it. So we spend most of our time listening even if there is a difference in the level of achievement and understanding. This is normal among individuals because of the individual differences, and it is a essential factor in the ability to talk , So that the learner can't pronounce the words correctly only if he/she listened well, as well as guiding between the listening skills and writing skills, because the writing mastery depends mainly on good listening that makes the learner able to distinguish between the letters and sounds, undoubtedly the good listener needs to increase the language and intellectual capital and cultural expression, that made his/her expression is more strength, although speaking expressive art and reading receptive art, but there is a great relationship between speaking and reading, each affects the other and influenced by, speaking weakness leads to the ability to read and to write, perhaps The importance of what has been revealed by some Studies that normal human takes in listening one third of what it takes in reading that is one of learning methods that helps to receive information, at the childhood level, the listening period is consider a period of custody for the rest linguistic skills of child, as the speaker reflects in the spoken language that he / she listens at home and the surroundings, so the speaker and his/her accent and fluent is effect on the listener and lead him/her to emulate what has he/she heard, Given the broadening of encouraging conditions for listening art [2]. The importance of language is reflected in the functions it performs. This aspect has attracted the attention of scholars, some of them have been viewed from a philosophical point of view, some of them have seen it from a social point of view and some of them have brought together the two sides, the listening is the origin of the language. But when the two languages were defined as one was audible and the other visual, so there are a lot of studies dealt with the listening skill, some Arabic studies and other foreign languages because of the importance of this skill in shaping the language of the individual, as well as its importance in developing its abilities [4]

METHODOLOGY

It includes a presentation of the procedures that were carried out to achieve the research aims, starting from research methodology, experimental design and identifying the research community and its sample, then prepared requirements and tools of research, as well as the presentation of the statistical methods used. The nature of the research requires an experimental approach that means the way that the researcher adjusts all the variables that effect of any phenomenon, Except for the (independent) experimental variable to measure its effect on the phenomenon (dependent variable).

The Experimental Design of the Research

It includes a particular independent variable (listening skills) and a dependent variable (learning difficulties). The experimental design is the search for a particular method for distributing the processors to the experimental parts so that we can obtain the least possible mistake, so the researcher used the experimental design with one group with pre-test and post- test.

Community and Sample of the Research

The community of the research made up of all pupils of fourth class in primary school of the General Directorate of Education in Babylon Governorate for the academic year (2017-2018), while the research sample, the researcher chose(Al- Al-Marifah Coeducation School) in the city center of Babylon intentionally in order to conduct her research, after choosing (Al- Al-Marifah School) the researcher found that the school made up of (100) pupils (male and female), who aged (10-13) years , the researcher applied the listening skills

test to identify pupils who had a low listening skill, After applying the test, the researcher found out that (12) pupils got the lowest marks on listening skills test. So the sample consisted of (12)) Pupils, who will be trained on listening skills.

Research Instrument

The listening skills test was built to train pupils in the research sample as well as the instrument needs to require the following steps:

Preparation of the Test Items

Through the researcher's knowledge of some of the literature related to the research variables and listening skills tests, the researcher formulated the items of the listening skills test (30) items, then alternatives have given for answering (0,1) , that gives (0) for the wrong answer and (1) mark for the correct answer, so the highest mark be (30) while the lowest mark be (0).

Preparation of the Test Instructions

These instructions aim to explain the test idea in the simplest form to facilitate the process of the test applying, because the clear and understandable instructions contribute to increase the coefficients of the validity and consistency and objectivity of the test, in order to rely on the test, it is necessary to extract the cykometric properties:

The Test Validity

The validity of the test was verified and the validity of the structure was confirmed. The results showed that the apparent validity achieved the agreement percentage (80%) by the arbitrators. As for the validity of the structure, the results showed that all the test items were statistically significant, so the test considered validate.

The Exploratory Applying of the Test: that contains the following:

*** The First Test Applied:**

The listening skills test in the first test stage was applied to a group of fourth class pupils of primary without the research sample , that was (30) pupils , The purpose of it, is to know the clarity of the instructions and the test instructions, the comprehension and clarity of the test items for the pupils and calculate the time required for the test.

*** The Second Test Applied:**

The test was applied to a sample of (100) pupils in the fourth class of primary without research sample, that aims to analyze the test items statistically.

Discrimination Item:

Discrimination item is one of the most important things in test items that means the ability of items to find out about the pupils with the measured character, and the pupils who do not possess it. The value of the coefficient of distinguishing between the test items ranged from 0.32 to 0.60 that considered all the test items with a suitable and good factor.

The Test Stability

Estimation of the stability of the characteristics of the good test, although validity is more important than it, because the validity measure is constant and may not be a fixed measure is true because it may be homogeneous in its items, but measures a property other than that prepared for measuring, and to achieve the stability of the test was found to maintain the method Kyoder Richardson 20.

The Methods of Kyoder Richardson

Stability according to Kyoder Richardson 20, to determine the consistency of internal consistency, by determining how all test vocabulary is related to all other vocabulary and the test as a whole. Internal consistency results when all vocabulary or test tasks are linked. To estimate the stability coefficient, the researcher used the Kjoder Richardson equation 20 of the analysis sample The coefficient of stability of the test (0,75) was a good stability coefficient according to Ebel.

The Program Which Prepared to Train Pupils on Listening Skills:

The sessions of the program were prepared. The sessions of the program consisted of (28) sessions, and the time of each session (60) minutes in which the researcher used strategies (story strategy, summarization and taking roles) and video and recorded stories, the researcher used a variety of activities and each activity commensurate with the skill to be improved The activities and exercises have a great role in improving the listening skills of pupils, especially children, so these stories change in each session, whereas they discuss the

events of the story in the session.

The Statistical Methods Used

The researcher used Wilcoxen's test to compare pre-test and post-test marks for test listening skills.

RESULTS AND DISCUSSION

After the researcher chose the research sample and applied the listening skills test, the program was also applied to the sample, the test was applied to the sample before and after applying the program, the researcher used the Wilcoxen's test to identify the differences between the pre- and post-test, as in Table (1). Through the above table, the results showed that the calculated value was (292.4), which is less than the ruler value of (17) at the level of significance (0,05), indicating that there are differences between the pupils' marks before and after the applied the program in favor of the post-test, so the null hypothesis disagreed, while the alternative hypothesis agreed. In addition, the researcher used the equation (Mac - Gujian) in the extraction of the impact size of the program effectiveness between the pre- and post-test , Table (2). The results of the this research refer to the effectiveness of the program that's used to improve the listening skills of fourth class pupils in primary with educational difficulties. The results showed that the pupils who were exposed to the program improved their listening skills, so that the listening level increased significantly compared to listening before applying the program. The researcher attributed this positive result of the current research to that the training program was built according to the requirements of pupils with learning difficulties, and that the skills contained in the program commensurate with their abilities and potential and training to improve listening skills came in accordance with the structural theory that emphasizes the management of class discussion In addition, the researcher has used several different techniques in training to improve listening skills (verbal reinforcement, applause, praise, feedback). These methods increase the appearance of the desired response in the future and results in this Lib to strengthen its occurrence more and resurface again in other similar situations in the future. The results showed that there is no statistically significant difference between the male and female marks in the post-test within the experimental group in listening skills as a whole. In essence, this process is successful by stimulating the pupils to the topic of the sessions so it can be said that the training programs based on scientific and objective basis may have a great role in helping pupils to face the problems they face.

Table 1. A comparison of pre-test and post-test marks shows the listening skills test

No.	The marks of the pupil in the pre-test	The marks of the pupil in the post-test	Diffe-rences
1-	23	24	1
2-	15	27	12
3-	12	25	13
4-	14	29	15
5-	18	19	1
6-	18	29	11
7-	19	29	10
8-	13	21	8
9-	17	19	2
10-	20	29	9
11-	14	29	15
12-	17	26	9

Table 2. The impact size of the program effectiveness

Average the pre-test marks	Average the post-test marks	Highest mark on the scale	Final sample size	Value of effect size
16‹66	25‹5	30	12	0.55

CONCLUSION

The test of listening skills is used to identify the scope to which these pupils' possess of these skills. The researcher used the suitable statistical methods such as percentages and (w) test , the results of research reached to put a list contains all the listening skills required, the results of the research refers to a low level of the sample in all the listening skills required especially the organization of ideas skill as it presented in the audible text.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon College of Basic Education, Iraq and all experiments were carried out in accordance with approved guidelines.

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Theoretical Study of Extensive Air Shower Effects in Atmosphere by Simulating the Lateral structure of Several Cosmic Radiations

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ABSTRACT

Extensive air showers (EAS) are a cascade of electromagnetic radiation and ionized particles that produced in the atmosphere through the interaction of a primary cosmic ray with the atom's nucleus in the air producing a huge amount of secondary particles such as X-ray, electrons, neutrons, muons, alpha particles, etc. In this work, EAS effects were demonstrated by estimating the lateral distribution function (LDF) at ultrahigh energies of the various cosmic ray particles. The LDF of charged particles such as electron and positron pair production, gamma and muons particles was simulated at ultrahigh energies 10^{16}, 10^{18} and 10^{19} eV. The simulation was carried out using an air shower simulator called AIRES system version 2.6.0. The effect of the primary particles, energies and zenith angle (θ) on the LDF of charged particles produced in the EAS was taken into account. Comparison of LDF for charged particles and experimental results gave good agreement for electron and positron pair production and muons particles at 10^{19}eV for θ=0° and 10°.

Keywords: *AIRES system; lateral structure; extensive air shower; muons.*

INTRODUCTION

High energy cosmic rays have been detected via the EAS that produced in the Earth's atmosphere [1]. In 1930, Pierre Victor Auger, French physicist was discovered EAS through producing more and more particles in the atmosphere[2]. A little part of the primary particle's kinetic energy has been converted into mass energy. Then, the residual kinetic energy can be distributed through the shower. The multiplication process is still continuing till the EAS particles energy still insufficient for producing more and more particles in sequential collisions. This stage of shower development can be called the maximum of shower [2,3]. The LDF of charged particle in EAS is a requisite quantity for the observations of the Earth's cosmic radiation, which are mostly derived from the EAS observables [4]. The parameter that utilized for describing the shape of the lateral structure density is the lateral shape parameter in the NKG function "Nishimura-Kamata-Greisen function [5,6]. The EAS develops in a convoluted way as a combination of electromagnetic and hadronic showers. It is important to fulfill a detailed numerical simulation of the EAS for inferring the primary cosmic radiation properties, which produce them. The number of charged particles in ultrahigh energy EAS may be enormous and may exceeding 10^{10}, therefore the simulations are an important way to challenge this situation [7]. Before the era of high-speed computing, Hitler presented a very simple model for the development of electromagnetic cascade[8]. At the time, Hitler, Rossi, and Gaisser developed more sophisticated analytical tools, which included more physical influences[9,10]. In 2008, Cotzomi studied some observations about the LDF of charged particles at energy above 10^{17}Ev [11]. In 2013, the age parameter of the lateral structure has been studied by Tapia by estimating the chemical composition of EAS particles [12]. Recently, (in 2018), Ivanov was studied the distribution of the zenith angle of the cosmic ray showers measured with the Yakutsk array and its application to the analysis of arrival directions in equatorial coordinates[13]. The results of the current calculations show that the density

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of charged particles reaches the Earth's surface, such as the electron and positron pair production, gamma and muons particles, by simulating the LDF performed using the Monte Carlo AIRES system at ultrahigh energies 10^{16}, 10^{18} and 10^{19}eV. The comparison of the estimated LDF of the charged particles such as the electron and positron pair production and muons with the simulated results by Sciutto and Yakutsk EAS observatory gives good agreement at 10^{19}eV [14,15].

METHODOLOGY

Hitler's model is the simplest conception of electromagnetic cascades and can extends it to the EAS. The purpose of using a very simple model is to show clearly the physics involved. Nevertheless, the most significant properties of the electromagnetic cascades has been predicted by Hitler's model [7]. In the Figure 1a was shown a single photon that radiated by a single electron after transmitting splitting length [7]:

$$d = \lambda_r \ln 2 \quad \ldots\ldots (1)$$

Where, λ_r is the radiation length in the medium; d is the distance over which an electron loses, on average, half of its energy by radiation. After traveling the same distance, the photon is split into $e^{\pm}$ pair. In either case, the particle's energy (electron or photon) is assumed to be evenly divided between two couple particles. After n splitting lengths, the distance x is given by:

$$x = n\,\lambda_r \ln 2 \quad \ldots\ldots (2)$$

The total size of the shower for the electrons and photons is:

$$N = 2^n = e^{x/\lambda_r} \quad \ldots\ldots (3)$$

When the particle energies become too low for pair production, the multiplication of EAS particles ceases. Therefore, Hitler takes this energy of electron as a critical energy that is given by the symbol (ξ_c^e). The average energy lose of collision will exceed the radiative losses.

Through supposing a shower that initiated by a single primary photon with E_o primary energy, the cascade in this shower will reach its maximum size ($N = N_{max}$) when the produced particles have a critical energy ξ_c^e, therefor [7]:

$$E_\circ = \xi_c^e N_{max} \quad \ldots\ldots (4)$$

As shown in figure 1b, the air showers initiated by the hadrons were designed using a method similar to Hitler's method [7]. Charged ($\pi^{\pm}$) and neutral (π^o) pions produced when hadron particles traversing one layer in atmosphere. Through this process, the π^o pions directly will be decayed to photon particles and therefore the electromagnetic cascade initiated [7]. Figure 1b demonstrates the electromagnetic showers through the decaying of the π^o pions (dashed lines). While the $\pi^{\pm}$ pions will continue interacting in the shower until their energy become below the critical pion energy (ξ_c^{π}). Accordingly, the $\pi^{\pm}$ pions will decay to muons that reach the earth [7].

Lateral Distribution Function

The LDF of charged particles in EAS is an important quantity of the ground surveillance for cosmic radiations, from which most cascade observables are deduced [12]. Studying of EAS may be performed experimentally on the surface of the ground, underground and at many mountain rising through determining some LDF quantities, i.e. the density of charged particles initiated in EAS as a function of the shower core distance or in another meaning, the LDF is the shower structure of the cascade at various depths in atmosphere [2]. The expression that used extensively for describing the LDF form is the NKG function that is given through the forum [5]:

$$\rho(r) = \frac{N_e}{2*\pi*R_M^2} * C(s) * \left(\frac{r}{R_M}\right)^{(s-2)} * \left(\frac{r}{R_M} + 1\right)^{(s-4.5)} \quad \ldots\ldots (4)$$

Where $\rho(r)$ is the particle density on the distance r from the shower core, N_e isthe total number of shower electrons, R_M =118 m is Molier radii, s isthe shower age parameter, and $C(s)$ is the normalizing factor which is equal $0.366\,s^2 * (2.07 - s)^{1.25}$ [6].

RESULTS AND DISCUSSION

Simulating of LDF using AIRES system

AIRES is an acronym for AIR-shower Extended Simulations, which is defined as a set of programs and subroutines that used for simulating the EAS particle cascades, which initiated after interaction of the primary cosmic radiations with a high energies in the atmosphere and manage all the output associated data [14]. AIRES provides full space-time particle propagation in a true medium, where the features of the atmosphere, the geomagnetic field and Earth's curvature are taken into account adequately[14]. There are many particles are taken into account through the simulation using AIRES system such as: "electrons; positrons; gammas and muons". The incident primary particle in EAS may be primary proton or iron nuclei or other primaries that mentioned in the AIRES guide document with a very high primary energies that may exceeding 10^{21} eV [14]. Figure 2 shows the density of several secondary particles as a function of the distance from the shower axis that reaches the Earth's surface by AIRES simulation. The effect of the primary particles (proton) and energy (10^{19}eV) on the density of charged particles produced in the EAS was taken into consideration. As shown in figure 2, the density of several secondary particles decreases with increasing the distance from the shower axis. Finally, the primary energy is divided between muons and electromagnetic particles (electron and positron pair production and gamma particles) in sub-showers. Figure 3 displays the effect of the primary particle energies on the density of secondary particles for zenith angle ($\theta = 10^{\circ}$) of the primary particles (iron) by AIRES simulation. Through this figure one can see that the lateral density of different secondary particles is directly proportion to the primary particle energy, i.e. the lateral density increases with increasing the primary energy.

Comparison with Sciutto experience and the Yakutsk Observatory

Figure 4 demonstrates the comparison between the present results of LDF that performed by AIRES simulation (solid lines) with the results simulated by Sciutto (triangle symbols)[14].This figure displayed a good agreement of the secondary particles (electron and positron) that were initiated by primary proton at energy 10^{19}eV and vertical EAS showers. The Yakutsk EAS array studies the very high energy cosmic radiations, which occurs in the field of astrophysics, that is, an important area in the physics. There are two main goals for the construction of the Yakutsk EAS observatory; the 1st goal is the elementary particles investigating of the cascades that initiated by the primary particles in atmosphere. The 2nd goal is the astrophysical characteristics reconstruction of the primary particles such as: " mass composition, energy spectrum, intensity and the their origin" [15]. Figure 5 shows the comparison between the present results with the experimental data that obtained by Yakutsk Observatory [15].The curves in this figure displayed a good agreement for(electron and positron) that initiated by primary proton at energy 10^{19} eV and slanted EAS showers with $\theta = 10^{\circ}$.

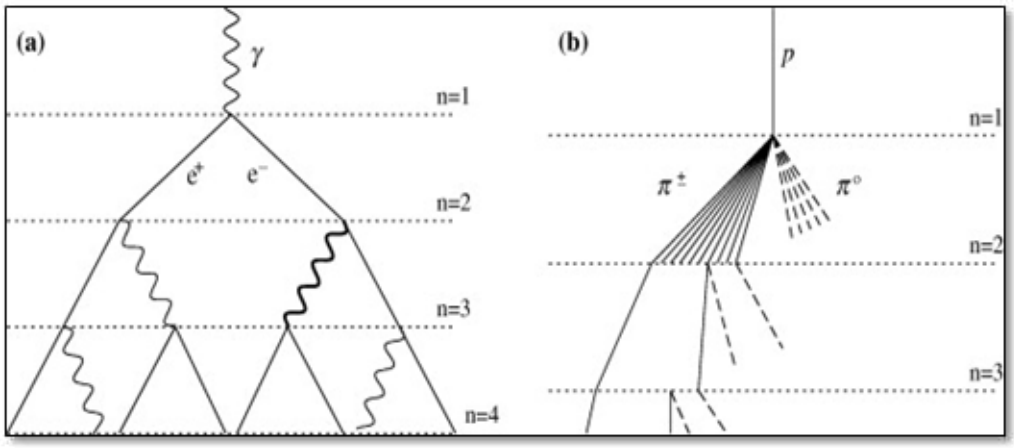

Figure 1. Schematic views of (a) Electromagnetic cascade and (b) Hadronic shower[7].

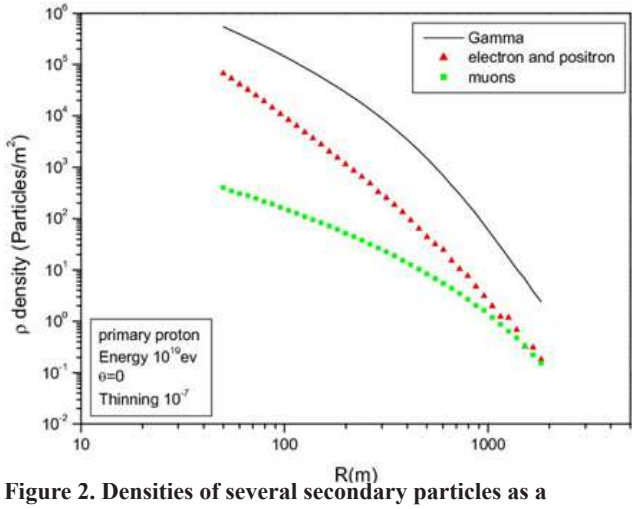

Figure 2. Densities of several secondary particles as a function of *R* that reaches the Earth's surface for vertical showers at energy (10^{19} eV) of proton.

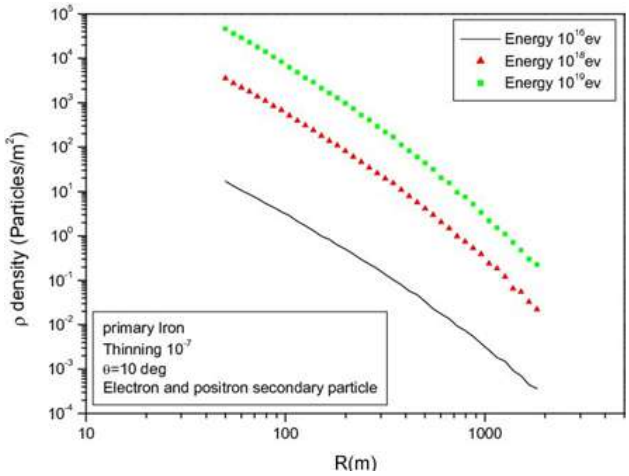

Figure 3. The primary energy effects on secondary particle densities for primary Fe at zenith angle (θ = 10).

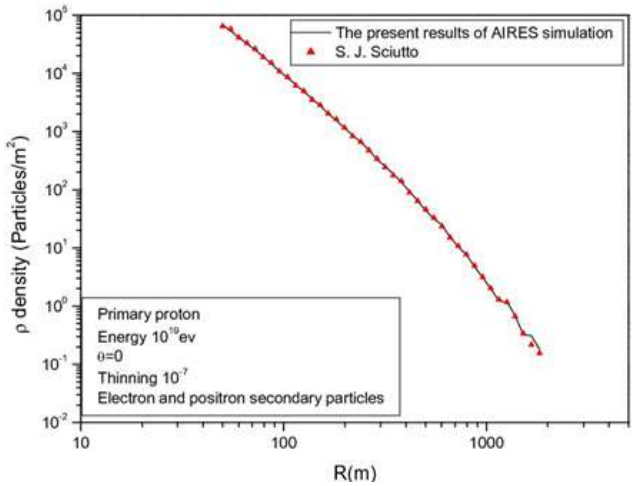

Figure 4: Comparison between the present results of simulated LDF by AIRES system with the results that simulated by Sciutto for primary p at energy10^{19} eV for (electron and positron) secondary particles.

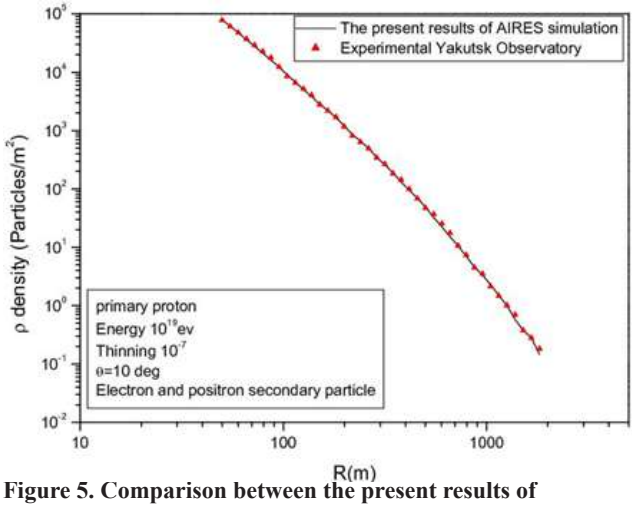

Figure 5. Comparison between the present results of simulated LDF by AIRES system with the experimental data obtained by Yakutsk Observatory for primary p at energy10^{19} eV for (electron and positron) secondary particles.

CONCLUSIONS

In the present work, the lateral distribution function of charged particles using AIRES system for two primary particles such as (proton and iron nuclei) was simulated at different ultrahigh energies 10^{16}, 10^{18} and 10^{19} eV. The simulation of charged particle lateral structure demonstrates ability for identifying the primary cosmic ray particle and its energy. The important advantage of the present work is to make a library of Lateral structure samples that may utilized for analyzing real EAS events that detected and registered with an EAS arrays. The introduced results using AIRES system are identified with Yakutsk experimental data, proving that AIRES system provides an appropriate environment for the study of high-energy cosmic rays. Therefore, charged particles reaching the Earth's surface have many effects on weather, human health and other effects.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Physics, College of Science, Mustansiriyah University, Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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Type II Toxin Antitoxin System in Imipenem Resistant *Klebsiella pneumonia* in Baghdad, Iraq

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ABSTRACT

Toxin Antitoxin (TA) systems have recently received much attention as one of the most promising antimicrobial targets. This study was designed to evaluate the presence of type II toxin antitoxin system and biofilm formation among imipenem resistant *Klebsiella pneumoniae* isolates in Baghdad. A total of 39(22.94%) *Klebsiella pneumoniae* isolates were collected from patients. Antimicrobial susceptibility test was performed and the biofilm formation was assayed by micro titer plate, then PCR was performed for detection of Toxin Antitoxin -Type II, Biofilm and Quorum sensing genes. The results show that the imipenem resistance was seen in 23(58.97%) of *K.pneumoniae* isolates. Then, the isolates showed levels of resistance percentage to antibiotic, with a highest resistance rate reached to (100%) for ampicillin and recorded lowest resistance rate to ciprofloxacin and levofloxacin reached to (10.26%) and (7.69%), respectively. Among these isolates, 22(56.41%) were biofilm producers. All 39 *K.pneumoniae* isolates showed different results for *ompA* and *bap* genes when were found by 9(23.08%) isolates for *ompA*, while, all isolates didn't have *bap* gene. Further, TA system genes were found by 15(38.46%), 15(38. 46%), three (7.69%) and five (12.82%) for *mazEF, ccdAB, relBE*and *mqsR.* On the contrary, all isolates didn't have QS system genes as *lasIR*and*rhlIR* genes.

Keywords: *Klebsiella pneumoniae*, imipenem resistance , persister cells, plasmid.

INTRODUCTION

A toxin-antitoxin (TA) system is a set of two or more closely linked genes that together encode both a protein "poison" and a corresponding "antidote" [1]. Accumulating knowledge about structure and function correlation of toxin-antitoxin systems from pathogenic microorganisms fordevelop antibiotic that target specific bacteria. Toxin antitoxin systems were initially discovered as plasmid in 1983 addiction systems on plasmids with low number due to their ability to stabilize plasmids by post segregational killing [2]. Later on, they were also discovered in chromosome play therole in the stabilization of the chromosome and integrative conjugative plasmids [3]. However, the definition of toxin-antitoxin modules is no longer restricted to entities that provide control over genetic material, but expanded to a wide range of biological functions including defense against phages, growth control, persistence, biofilm formation programmed cell death (PCD), and general stress response [4]. TA systems were classified to six types depending on the activity and nature of the antitoxins: antitoxins :type II, IV, V and VI toxin antitoxin systems [5]. Type II TAs, the most prevalent type on prokaryotic genomes and plasmids, are bicistronic operons which code for a toxin protein and anantitoxin protein. Most of the type II TAs are typically less than 1 kb, encode endoribonuclease toxins [6] and propagate through horizontal gene transfer [7]. Numerous toxin are mRNA interferases, either ribosome dependent (e.g. RelE, YoeB, YafQ and YafO) or ribosome-independent (e.g. YhaV, MqsR, ChpBK, MazF, HicA and PemK) [8].

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MATERIALS AND METHOD

Bacterial Isolates: A total of 343 different specimens were collected from patients in Baghdad hospitals between October 2015 and March 2016 for

isolation *Klebsiella pneumoniae* isolates, the isolates were diagnosis using and vitek 2 system.

Antibiotic sensitivity testing and MIC to imipenem

The sensitivity testing of all isolates to different antibiotics and the MIC to imipenem were testing by usingVitek-2 system using antibiotic sensitivity test number (AST-GN69) and (AST-N222) cards according to the manufacturer's instructions which included antimicrobial agents as follows: Ampicillin(AM), Amikacin(AK), Amoxicillin/clavulanic-acid(AUG), Ampicillin/sulbactam (SAM), Aztreonam(AZT), Cefazolin(CZ), Cefepime(CPM), Cefotaxime (CTX), Ceftazidime(CAZ),Ceftriaxone(CRO), Ciprofloxacin(CIP), Doxycycline(DXT), Gentamicin(GM), Imipenem(IMI), Levofloxacin(LEV), Meropenem(MEM), Nitrofurantoin(NIT), Piperacillin(PRL), Piperacillin/tazobactam(PTZ),Tetracycline(T) Ticarcillin/clavulanate (TIM), Tobramycin(TM) and Trimethoprime/sulphamethoxazole(TS.

Detection of Biofilm Formation

In the present study, we screened the isolatesfor their ability to form biofilm by micro titer plate according tothe procedure described by Badmasti *et al*. (2015) [9]. Briefly, *K.pneumoniae* isolates were grown overnight in LB broth+0.25 % glucose (LBG) prepared at 37 °C. On thenext day, theculture diluted 1:50 infreshly prepared LBG pre-warmed to 37° C. Then, 200 ml suspension was used to inoculate sterile 96-well polystyrene microtitre plates, followed byincubation for 72 h. at 37 °C .After washes with PBS prepersed any remaining biofilm wasstained with crystal violet for 30 min after drying at room tempreture for 15 min .Washed with PBS again. The dye bound to the adherent cells was resolubilized with 200 ml ethanol/acetone (80:20, v/v) and OD570 quantified using an ELISA reader. The O.D value for control well was deducted from all the test O.D value.

Molecular Detection of Toxin Antitoxin -Type II, Biofilm and Quorum sensing genes

The imipenem-resistant *Klebsiellapneumoniae* isolates tested for Toxin-antitoxin (TA) (TypeII) system genes, Biofilm genes and Quorum sensing(QS) system genes by using primers (Table 1). DNA genomes from isolates were extracted by using a commercial purification system (Genomic DNA Purification Kit) and Plasmid DNA was extracted by PureYield™plasmid Miniprep system, then PCR was used to amplify these genes in a total volume of 25 µl containing 1 µl PCR buffer, 2 mM MgCl2, 2 mM dNTPs, 10 pmol of primers, 0.25U *Taq* DNA polymerase and 5 µl of template DNA. PCR products were analyzed by electrophoresis on 1% (w/v) agarose gel containing DNA safe. Agarose gels visualized by gel documentation (**10**).

RESULTS AND DISCUSSION

Bacterial Isolates

In this study, a total of 39 isolates (22.94 %) *Klebsiella pneumoniae*was isolated from 343 different clinical samples in Baghdad city.It was clear that it could be found as causative agent of RTI (sputum) 11(28.20%), also it is mainly associated with blood samples 9(23.08%); beside to 7(17.95%) from burns and 6(15.38%) from wound swabs; with low percentage from urine samples and ear infection which showed, 4(10.26%) and 2(5.13%), respectively.

Antimicrobial Susceptibility of *K. pneumoniae* isolates

In current study, isolates of *Klebsiella pneumoniae* showed a different levels of resistance rate to antibiotic (table 2), with a highest resistance percentage reached to(100%) for ampicillin, (89.74%) for piperacillin,(84.62%)for cefazolin, ceftazdime and cefepime, (82.05%) for ampicillin/sulbactam, ceftriaxone, aztreonam and cefotaxime,(76.92%) gentamicin, (71.8%)ticarcillin/clavulanic acid, (66.67%) amoxicillin /clavulanic acid and tobramycin, then moderate resistance percentage reached to (48.72%) for nitrofurantation, (30.77%)for tetracycllin and doxycycline, and recorded lowest resistance rate to ciprofloxacin and levofloxacin reached to (10.26%) and (7.69%), respectively. The numbers of *K.pneumoniae*isolates that gave MIC values more than break point for imipenem were 23 (58.97%) and these values assure resistance of studied *K.pneumoniae*isolates for this antibiotic.

Biofilm Formation

The results obtained that out of 39 *K.pneumoniae* isolates, 22(56.41%) were biofilm producers isolates by using micro titer plate. The current results recorded

that the highly percentage of biofilm production, and imipenem resistance for *K.pneumoniae* isolates was located within theweak and then moderate patterns. Therefore, these isolates may need this resistance but in this type of patterns of biofilm formation more than other patterns. From weak pattern of biofilm producers for *K.pneumoniae*, results showed that the highly number of biofilm producer's isolates and biofilm producers imipenem resistant isolates were isolated from sputum specimens. The results showed that the *ompA* gene was presence in 9(23.08%) isolates of *K.pneumoniae*, while, all isolates didn`t have *bap* gene.

Detection of Toxin-antitoxin (TA) (Type II) and QS systems genes

All *K.pneumoniae* isolates were tested for detection of toxin-antitoxin (TA) (Type II) and Quorum sensing (QS) systems genes by PCR technique. The PCR products have been confirmed by comparing its molecular weight with 100 bp DNA Ladder (table 3).The presence of *mazEF* system genes that which composed of *mazF* and *mazE* genes were in 15(38.46%) isolates (figure 1) and also *ccdAB* system genes that which composed of *ccdB* and *ccdA* genes were presencein 15(38.46%) isolates of *K.pneumoniae* (figure 2). On the other hand, results showed that *relBE*system genes (*relE*toxin and *relB*anti-toxin)were presence in three (7.69%) isolates (figure 3). All isolates contained plasmids. Eight of isolates has just one mega-plasmid (more than 10kb). Seventeenth of isolates has just one large plasmids, their molecular size between 4kb-10kb.In addition, three of isolates has just one large plasmidstheir molecular size more than 2kb. While, six of these isolates pose more than one plasmids, their molecular size between (4kb-10kb).On the other hand, 4, 14 and 4 eluted plasmid DNA of *K.pneumoniae* were positive to *mazEF, ccdAB, mqsR* genes respectivly, while 11, 1, 3 and one isolate were positive to *mazEF, ccdAB, relBE*and *mqsR*when we applied monoplex PCR on the chromosomal DNA of these isolates.

Relationship between biofilm formation and genes of biofilm , TA and QS systems for all imipenem resistant isolates under study

All of imipenem resistant isolates showed different results between them after tested for detection of some genes under study and their relationship with biofilm formation. From the detection results, 17 *K.pneumoniae* isolates which imipenem resistant and biofilm producers showed positive results for *ompA* reached to seven (41.18%), while didn`t have *bap* genes. Further, for TA and QS system genes, these isolates showed positive results reached to seven (41.18%), 10(58.82%) and three (17.65%) for *mazEF, ccdAB*and *relBE*,while didn`t haveothers genes as *mqsR, lasIR*and *rhlIR*. Therefore, the results revealed to that no- relationship between biofilm production and these genes except *ccdAB* and it is interesting, for clarify the relationship between these parameters may be need to study gene expression for these genes to determine this relationship. DNA sequencing was performed on PCR products, sequenced PCR products revealed strong sequence identity (99 -100%) to the reference TA system sequence. Interestingly, results in present study showed approximately that all *K.pneumoniae* isolates were multidrug resistant isolates (MDR). Fouzia and Damle, (2015) [11] observed that ≥80% isolates of *K.pneumoniae* were resistance to third generation cephalosporins and other antibiotics, making them multidrug resistant (MDR) isolates. The results of antimicrobial susceptibility test of *K.pneumoniae* in current study were consistent with other results as Al-Sehlawi (2012) [12] who showed that the resistance rate of *K.pneumoniae* isolates toward the antimicrobials was (92.2%) to piperacillin, followed by(59.2%) to nitrofurantoin, (50%) to gentamicin and (48.5%) to tobramycin. Recently, the study by Hussein and Hamed(2017) [13] obtained the antimicrobial resistance patterns of isolates was (100%) resistance for ampicillin, (87.6%) for cefazolin, (85.71%) ceftazdime and trimethoprim/sulf., (83.92%)cefepime and ceftriaxone, (78.58%) ampicillin/sulbactam, (66.07%) gentamicin, (57.14%) tobramycin. Local study done by Al-Marjani and Khadam (2016) showed that 64.29% and 85.71% of isolates were resistant to ceftazidime and cefotaxime respectively and ciprofloxacin 37.5%. From weak pattern of biofilm producers for *K.pneumoniae*, results showed that the highly number of biofilm producers isolates and biofilm producers imipenem resistance isolates was isolated from sputum specimens. One of the present study objectives was to detect the existence and prevalence of common biofilm encoding genes among all clinical isolates. The results showed that the *ompA* gene was presence in 9(23.08%) isolates of *K.pneumoniae*, while, all isolates didn`t have *bap* gene. The antitoxin physically forms a toxin–antitoxin complex (TA complex), resulting in toxin sequestration from the cellular target. The antitoxins have a high turnover rate due to rapid degradation by proteases like

Lon, while toxins are relatively stable. The TA complex binds to the promoter/operator region of the TA operon, thus inducing transcriptional repression. This auto-regulatory mechanism prevails in most of the type II TAs characterized to date [8],One of the powerful antibacterial strategies is an artificial activation of the toxin, which could be accomplished by using small compounds or peptides as inhibitors of the protein (toxin)-protein (antitoxin) interactions [14]. Then, from PCR analysis of plasmid DNA did not yield any positive amplification, indicating that in *A.baumannii*, the screened TA systems were chromosomally mediated. Then, Yamaguchi *et al*.(2011) [8], revealed to the presence of at least 33 TA systems in *E.coli*and more than 60 TA systems in *M. tuberculosis* suggests that the TA systems were involved not only in normal bacterial physiology but also in pathogenicity of bacteria.

Table 1. Primers used for detection of genes encoding TA, biofilm and QS genes in imipenem resistant *K.pneumoniae* isolates.

Primer name	Sequence (5'-----3')	Product size(bp)	Reference
ompA	F: GCTACTATGCTTGTTGCTGCT R: CGCTTCTTGACCAGGTTGAAC	1023	Badmasti *et al.*(2015)
bap	F: ATGCCTGAGATACAAATTAT R: GTCAATCGTAAAGGTAACG	1449	
mazE	F: ATGATCCACAGTAGCGTAAAGCGT R: TTACCAGACTTCCTTATCTTTCGG	249	Hematie*t al.* (2014); Karimie*t al.* (2015)
mazF	F: ATGGTAAGCCGATACGTACCC R: TGGGGCAACTGTTCCTTT	288	
ccdA	F: GACAGTTGACAGCGACAGCT R: TCACCAGTCCCTGTTCTCGTC	199	
ccdB	F: GAGAGAGCCGTTATCGTCTGTT R: TCCCCAGAACATCAGGTTAATG	272	
relB	F: ATGGGTAGCATTAACCTGCGT R: TCAGAGTTCATCCAGCGT	240	
relE	F: GACGAGCGGGCACTAAAGGAAT R: TCAGAGAATGCGTTTGACCG	267	
mqsR	F: ACGCACACCACATACACGTT R: GCCTGGGTCTGTAAACATCCT	194	
lasI	F: GTGTTCAAGGAGCGCAAAGG R: AACGGCTGAGTTCCCAGATG	238	Hematie*t al.* (2014)
lasR	F: TCGAACATCCGGTCAGCAAA R: GTTCACATTGGCTTCCGAGC	128	
rhlI	F: CCGTTGCGAACGAAATAGCG R:CAGTTCGACCATCCGCAAAC	308	
rhlR	F:TCGCTCCAGACCACCATTTC R: GACGGAGGCTTTTTGCTGTG	284	

Table 2. Antimicrobial sensitivity test results of imipenem-resistant *K.pneumoniae* isolates

Antimicrobial agents.	Resistance (%)	Antimicrobial agents.	Resistance (%)
Amikacin	24(61.54)	Gentamicin	30(76.92)
Amoxicillin/clavulanic-acid	26(66.67)	Imipenem	23(58.974)
Ampicillin	39(100)	Levofloxacin	3(7.69)
Aztreonam	32(82.05)	Meropenem	22(56.41)
Ampicillin/sulbactam	32(82.05)	Nitrofurantoin	19(48.72)
Cefazolin	33(84.62)	Piperacillin	35(89.74)
Cefepime	33(84.62)	Piperacillin/ tazobactam	24(61.54)
Cefotaxime	32(82.05)	Tetracycline	12(30.77)
Ceftazidime	33(84.62)	Ticarcillin/clavulanate	28(71.8)
Ceftriaxone.	32(82.05)	Tobramycin	26(66.67)
Ciprofloxacin	4(10.26)	Trimethoprime/sulphamethoxazole	24(61.54)
Doxycycline	12(30.77)		

Table 3. Number and percentage of TA Type II and QS genes for *K.pneumoniae* isolates.

No. of isolates	39*K.pneumoniae*	
Genes name	No.(%) (+V)	No.(%) (-V)
mazEF	15(38.46)	24(61.54)
ccdAB	15(38.46)	24(61.54)
relBE	3(7.69)	36(92.31)
mqsR	5(12.82)	34(87.18)
lasIR	0	39(100)
rhlIR	0	39(100)

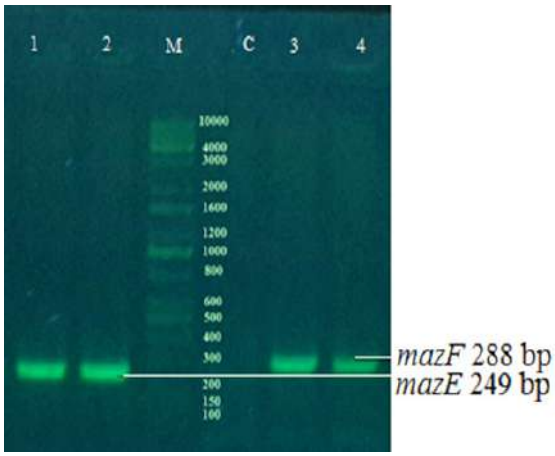

Figure 1. Detection of *mazEF* system genes by monoplex PCR. lanes 1-2,*mazE*; Lane M, 100 bp DNA ladder; Lane C, Negative control.; lanes 3-4, *mazF*; was done on agarose gel (1%) at 5 V/ cm for 1 h, stained with Red Safe dye and visualized on a UV transiluminator documentation system.

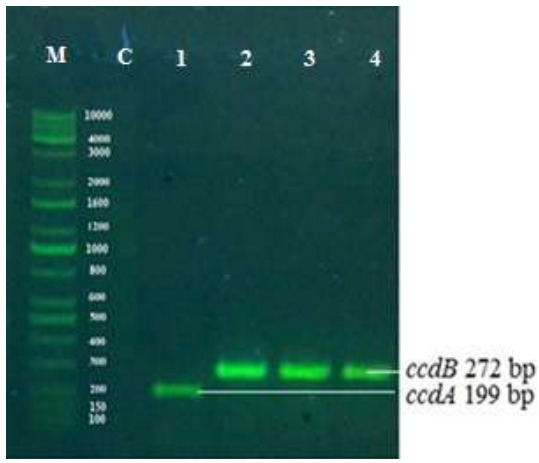

Figure 2. Detection of *ccdAB* system genes by monoplex PCR. Lane M, 100 bp DNA ladder.; Lane C, Negative control.; lane 1, *ccdA*.; lanes 2-4*ccdB*,; was done on agarose gel (1%) at 5 V/cm for 1 h, stained with Red Safe dye and visualized on aUVtransiluminator documentation system.

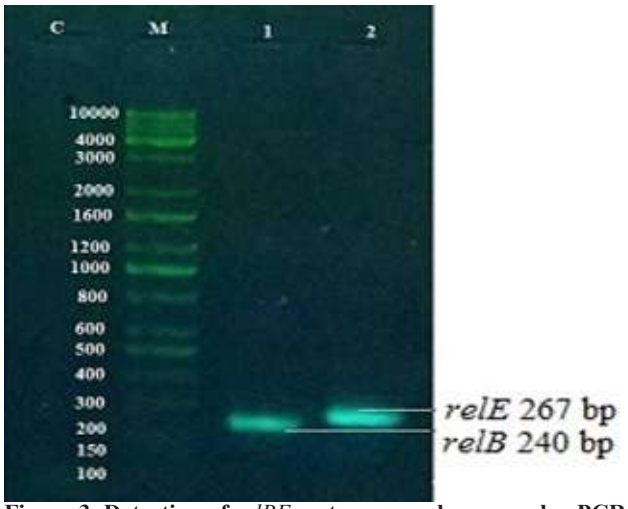

Figure 3. Detection of *relBE* system genes by monoplex PCR. Lane C, Negative control.; Lane M, 100 bp DNA ladder. Lane 1, *relB*, Lane 2, *relE*.; was done on agarose gel (1%) at 5 V/cm for 1 h, stained with RedSafe dye and visualized on a UV transiluminator documentation system

CONCLUSION

In conclusion, the *mazEF*, *ccdAB*, and *mqsR* are widespread in *Klebsiella pneumonia* clinical isolates in Baghdad.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Biology, College of Science, Mustansiriyah University, Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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Impact of Distinctive Education Strategy on Fourth Students Achievements in Physics

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ABSTRACT

The research aimed at identifying the impact of the distinctive education strategy in the achievement of students in the fourth class in physics. The researcher adopted the experimental research method as a methodology for conducting his research. It included an independent variable (the differentiated education strategy, the usual method) and a dependent variable. In order to obtain accurate and objective results in the following variables (the first course, the age of the month calculated by the months, the IQ test), before the application of the experiment equivalence, the researcher applied research tools to the two groups of the research. After correcting the students' answers, the researcher obtained the data of the two research groups. The data were statistically processed by (t –test) The results showed that the experimental group which was studied according to the differentiated education strategy, was superior to the control group which was studied in the normal way in the scholastic achievement variable.

***Keywords**: Differentiated Education Strategy, Achievement, Fourth Grade Students, Physics.*

INTRODUCTION

Education in general and science education are witnessing a great interest in the Arab and international countries there is a continuous development towards the best to keep pace with the characteristics of the scientific and technical age and the requirements of the twenty-first century and its challenges in the future. It is a continuous development movement to raise and improve the level and outputs of education and its quality in various types of education, Modern education has to keep up with the tremendous developments that happened in all aspects of life, so the teacher is no longer just a teacher but a learner of knowledge , the learner has an important role in the process of education and learning, and the teacher became organizer and guide of those processes[1]. The concept of teaching refers to the intended process and the organization through which the elements of the educational process (teacher, learner, curriculum) interact, which are carried out in accordance with scientific procedures planned for it and seeks to achieve desired goals and objectives in individuals. The important aspects through which the objectives of the educational system are achieved and to achieve the objectives of the learners must be paid attention to modern methods and methods of teaching [1-3].

The teaching of physics today has witnessed the use of different methods and techniques that provide learners with the means of learning that suit their abilities and speed of learning, whether learning individually or in groups. This helps to improve their skills for a better understanding of concepts. The emotional aspects that occur during the learning process play an important role in guiding the behavior of learners, especially at this age [4], which recently resulted in a lot of strategies and methods of modern teaching the educational process has become the Emphasizes on learning of the learner by himself through active participation rather than relying on the teacher [5], One of these strategies is the distinctive education strategy, which is a tool for teaching the scientific material. This type of strategy raises the capacity of the teacher and Learners and move them towards research, investigation, observation of behavior and the ability to measure. The use of this type of education is to raise the levels of all learners in the classroom all of them and not only focused on the weak learners.

METHODOLOGY

The researcher followed the experimental method, and the experimental is the researcher's interest to

ensure the impact it leaves on a set of independent variables on another set of dependent variables. The current study includes one independent variable (distinct education strategy) and a dependent variable. Therefore, the researcher selectes in this study a partial experimental design of two groups, the experimental group and a post-test control group. As in Table (1). The research society consists of students of the fourth clasd in the governmental schools of the General Directorate of Education in Babylon province for the academic year (2017-2018). The number of the students is not less than four divisions. In order to apply the current research experience, and after the researcher chose (junior high school) to apply the experiment, he found that it consists of four divisions of the fourth class (A, B, C, D), the researcher chose Division D in the random drawing method to represent the experimental group and the number of students (33) which will the students will be learend in accordance with the Education distinctive Strategy), the same way the researcher chose randomly Division (b) to represent the control group and the number of students (33) which students will be learend according to (the usual way). The researcher made sure to eqaul between the experimental and control groups so that the results of the research is more honest. so the difference between the experimental group and control rutern to the independent variable and remove all variables that may affect the results of the experiment and those variables are (age calculated by months, first chorus grades, IQ test) ,And the results were shown in table 2. For the purpose of maintaining the integrity of the experiment, the researcher tried to control the non-experimental extraneous variables, as they are not controlled can lead to improper results since it is impossible to distinguish between the impact and the effect of the independent variable .Here some of these variables and how to adjust them: Accidents associated with the experience: Experience in the search did not experience any emergency accident that impedes its progress. Experimental Extincation: No case of interruption, abandonment, or transfer of any student were carried out throughout the experiment. Sample Selection: The two research groups were chosen by the method of intent and the equivalence of the two groups were checked. Maturity factor: Since the duration of the experiment is unified between the two research groups and the age of the students were convergent so the growth will return to the members of the two groups at the same level, so this factor has not affected the search. Impact of experimental procedures: The researcher worked to limit the effect of experimental procedures that may affect the dependent variable during the course of the experiment. For the purpose of applying the research, the researcher prepared some of the requirements, including: The scientific material (content): The scientific material that the researcher is teaching, has been determined for the students of the two research groups during the period of the experiment (the second semester) of the academic year (2017 - 2018) The last five chapters of the fourth grade physics book, The researcher then prepared the behavioral goals: Here the researcher based on Bloom classification of the cognitive field consisting of six major levels of difficulty (recall, understanding, application, analysis, synthesis, assessment). The number of teaching plans is (16) for the experimental group that is taught according to the differentiated education strategy and the same for the control group which is taught according to the usual method.

Research Tool: The steps of the research tool (the collection test) are:

Determining the purpose of the achievement test: The requirements of applying thecurrent research are to prepare an achievement test that is used to measure the academic achievement of the research sample in physics. Therefore, the researcher has prepared an achievement test related to the studied subject and related behavioural purposes in accordance with the level of the research sample.

Determination of the purpose of the test: The objective of the test is to measure the achievement of students in the fourth grade scientific (research sample) in the chapters (sixth,seventh, eighth, ninth, tenth) of the book physics after teaching them.

Determining the number of test paragraphs: The researcher determined the number of paragraphs that constitute the test of achievement as the number of paragraphs of the test.

Preparation of the test map (table of specifications): The researcher prepared the specification table according to its basic steps, where he determined the relative importance of the five chapters (light, reflection and refraction of light, mirrors, thin lenses, static electricity), and determined the relative weights of each level In the light of the number of pages of the book chapters, after determining the paragraphs of

the test with (40) paragraph, the number of questions per cell was calculated in the specification table.

The formulation of the test paragraphs: After the preparation of the specification table, the researcher prepared (40) objective test results of the type of multiple choice with four alternatives to measure the level (knowledge, understanding, application, analysis, synthesis and evaluation) and the five topics of the book Physics , Reflection and refraction of light, mirrors, thin lenses, electrostatic).

Formulation of the test instructions: The researcher prepared instructions for the test of the collection, including how to answer (choosing one correct alternative to the paragraph, answering all paragraphs, the time period for answering, writing the triple name, the class and the division in the assigned space).

Correcting the test answers: After the test paragraphs were formulated and the test type was selected, a standard was established to correct the answers. It was developed (one score for each correct test paragraph) and (0) for the wrong answer and the unanswered paragraph that the student did not answer. Therefore, collective is (40 marks) and minimum (0).

The validity of the test: The veracity of the test was verified and the validity of the content was confirmed. The results showed that the virtual honesty is (80%) obtained a percentage of agreement by the arbitrators and specialists. As for the validity of the content, the results showed that all the test subjects were statistically significant. Measuring the comprehension of students in the fourth class in physics.

The pilot application of the test of achievement: It was in two phases

The first test application for the test of achievement: To clarify the clarity of the paragraphs and the instructions of the answer and to determine the test time, the test was applied to a sample of (40) students of the fourth class non-research sample to calculate the time taken to answer the test paragraphs through the calculation of the average (The first student and the last student). The average time required to answer the test scores was (18.5 minutes) and the test clauses were clear and the test instructions were understandable and there was no ambiguity.

The second pilot application for the test of achievement: The test was applied to a sample of (100) students of the fourth class non-research sample, the purpose of which is to analyze the statistical achievement test paragraphs represented by the coefficient of paragraph difficulty.

Statistical analysis of the test scores: The test scores were analyzed as follows:

The difficulty factor of the paragraph: By conducting statistical analysis of the terms of the test of achievement, it was found that the coefficient of difficulty of the paragraphs ranged from (0.20 —— 0.80), so the test scores are appropriate in terms of difficulty and ease.

The coefficient of distinguishing the paragraph: The important qualities that must be provided in the paragraphs of the test is the characteristic of discrimination and means the possibility of items or paragraphs to identify the individual differences of students and the test items are valid as the coefficient of discrimination items (0.25) and above the value of the coefficient of the test achievement is between(0.33—— 0.52) and with this the subjects of the achievement test have a good and appropriate discrimination coefficient.

Effectiveness of the wrong alternatives: The researcher conducted a statistical analysis (highest 27% and lowest 27%) degree to find the effectiveness of the wrong alternatives ranging from (- 0.3 — - 0.26) and it turned out that the alternatives of the test paragraphs are all effective and thus the collection of all appropriate.

The stability of the test: depends on the relationship between each paragraph or between all test paragraphs. The test paragraphs have a clear meaning that must be both true and consistent. Stability indicates that the test scores are identical when they are returned again, i.e., indicates the balance and stability of the students' grades in the test was found by method of half-fragmentation: This method is one of the most used methods, because it avoids the disadvantages of some other methods and in order to obtain two images of the test The researcher divided the paragraphs of the test into individual and marital paragraphs and choose the answers of students sample, which are (100) answers Pearson correlation between the scores of individual and conjugated vertebrates was obtained by the coefficient of constancy and its value was (0.75). Since the indexation stability coefficient of the test does not measure the total

homogeneity of the test (because it is only half constant), the correction was done using the Spearman Bruen coefficient, (0.88) which is a good coefficient of stability from the point of view of specialists.

Application of the research tool: The experimental and control groups were informed of the date of application of the test, one week before it was carried out, and it was applied after the completion of teaching the specific material for the two research groups at one time.

Statistical methods: The researcher used the t-test equation for two independent end-points to make the equivalence between the experimental and control groups in the following variables: (the age of time calculated in months, the achievement of students in half the year in physics, intelligence test).

RESULTS AND DISCUSSION

The results showed that the students of the experimental group who studied according to the differentiated education strategy are better than of the control group students who studied according to the usual method in the achievement test and this agrees with the studies that confirmed the superiority of the experimental group which was studied according to the differentiated education strategy on the control group which studied according to the usual method, as confirmed by previous studies.

Table 1. Experimental Design for the Research.

Group	Independent variable	The dependent variable
Experimental	Differentiated Education Strategy	Achievement
Control	The usual method	

Table 2. The (T-test) results of two independent groups samples of the research (age calculated in months, first course grades in Physics, IQ test)

Variables	Group	Arithmetic mean	Variance	Degree of freedam	T value		Level of significome
					Tabubr	Calcubted	
Age Calculated inmounths	Experimental	166.82	91.23	64	0.776	2.000	Not statistically Significant
	Control	165.82	29.92				
First course Grades	Experimental	63.73	191.82	64	0.548	2.000	Not statistically Significant
	Control	65.64	208.22				
Tntelligence test	Experimental	33.12	35.88	64	0.884	2.000	Not statistically Significant
	Control	31.88	28.52				

Table 3. Arithmetical mean, standard deviation, variance, T calculated value, tabular values of experimental and control groups scores in the achievement test.

Statistics / Group	Number	Arithmetic mean	Standard Deviation	Variance	Degree of Freedam	T value		Level of signifi-cance
						tabubr	calculated	
Experimental	33	12.28	17.5	26.73	64	4.359	2.000	Not statistically Significant
Control	33	22.18	5.88	34.57				

CONCLUSION

Using of a differentiated learning strategy has helped students to do different activities according to their abilities, aptitudes and learn according to their own potential. Using of a differentiated learning strategy has resulted diversification in the presentation of content and the use of more style and activity during the lesson has made the classroom interesting and renewable, away from stagnation and boredom.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Basic Education, University of Babylon, Babylon city, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Role of Religion and Spiritually in the Care of Patients in Family Medicine

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ABSTRACT

Religion and health care are two subjects that important to a patient suffering from any illness. However, the two concepts drifted apart at the start scientific revolution era although today the disciplines are closely connected. The study investigated the association of the two subjects by use of questionnaires which were mailed to 158 patients. The results were analyzed using various statistical methods and revealed that nearly 88 % of the respondents appreciated the role spirituality and religious beliefs played in medicine and healthcare. However, nearly 57 % percent of patients had a discussion on religion matters with their family doctors because of varied reasons such as time constraints and different religious background. The study revealed that spiritual and religious beliefs play an important role in the patients' medicine and healthcare.

Keywords; *spirituality, religious beliefs, medicine, health care.*

INTRODUCTION

People are confronted with life threatening diseases that leave them questioning the reasons for their existence or the purpose of their life. Thus they turn to their religious beliefs to strengthen their sense of control, support their hope or relieve their stress. Although the patient may seek medical help from specialists, they also turn to the creator in prayers and trust that the supernatural being will render a helping hand [1]. Thus for many centuries science and religion has always been closely interlinked. Actually, history indicates that medical and spirituality care was be conducted by the same individual. Christianity provides record of instances when God healed using similar remedies that were practiced in medicine. However, at the beginning of the Renaissance era, scientific revolution took place and faced rejection from the religious communities. Thus there occurred a drift between medicine and religion, because the earlier adopted the advanced scientific methods while the later served as a barrier to both knowledge and advancement. For instance, the Cartesian philosophy that was adopted by medicine viewed body and mind as two different items thus widening the gap between religion and spirituality [2,3]. At the start of 1900s the idea of importance of spirituality in medicine and psychological health was reintroduced by Carl Jung. He indicated that in all his patients, the religious outlook in their life has always been their last resort [4]. More so, Victor Frankl who survived the Nazi concentration suggested in his book named *Man's Search for meaning* that was published in 1946 stated that spirituality has a role to play in the mental health[5]. Religion and spirituality do not follow the scientific conventions and could thus be alienated further whenever its contribution to medicine is gauged using the scientific models. However, their main objective is to help an individual find the purpose of life and find their place in the world. Thus various prayers have been conducted to ailing persons as they continue with their conventional medication and positive outcome has been observed as indicated on this study. The duration between 1980 and 1990 witnessed the increased integration of religion and spirituality in medicine and healthcare. Popular press has published numerous articles that highlight the connection between of the two concepts in relation to both healing and comfort. Some of the practices that are applied are pastoral counseling, prayer in healing, evoking forgiveness or compassion. A survey was conducted by the National Center or Complementary and Alternative Medicine (NCCAM) in 2004 and discovered that prayer was preferred among the approaches that were listed in the survey. Thus the religious affiliation in addition to the patient's religious practices was related to their health and mortality [6]. Lee-

Poy conducted an in-depth interview on patients as well as a survey on family physicians. The outcome showed that religious and spiritual beliefs were crucial in the patient care in family medicine. However, the barrier that was identified was the physician comfort level but could be enhanced through medical education on religion and spirituality [7]. There is evidence that indicate that the importance of spirituality in coping with illness because it offers protection against despair in patients with terminal illnesses [7]. Saliman attended to persons termed as challenging patients that were referred to him by physician-in-chief in his medical center. One of such patient was Tina who believed that she had multiple sclerosis which she felt was not being treated properly even with her monthly visit to the Emergency Department (ED) for magnetic resonance imaging. The results read normal and this made her really upset thus prompting her to write complaint letters after every visit. However, after she visited Saliman's office, her attitude changed because when he noticed she was wearing a golden cross on her neck, he requested they pray after every session. Tina was fighting to be given 1g of IV steroids but the physician reasoned with her that she cannot be given medication without evidence of what was being treated. The prayer session continued for nine months and she kept away from ED and instead of asking for steroids, visiting ED or writing complaint letters she wrote commendation letter to the hospital administration. The medical practitioner concluded that prayer is a crucial component in patient's lives and thus he welcomed any chance of saying a prayer at the end of office visits [8]. Analysis on various studies on how patients pray reveals that some individuals preferred conversational prayers while others relied on memorized prayers like the Lord's Prayer for Christians or seven tools for Muslims. Some patients did not have a specific time or place for prayer and some appreciated praying with others [9-12]. A literature review conducted by Jors et al., [13] provided some of prayer items that patients include as well as the quotes they refers to in table 1. According to Ellen Barlow, [18] potential effect of spirituality and religion on a person's health cannot be ignored. The Spirituality, Health and Health Disparities Symposium conducted in December 2014 by the Harvard Medical School indicated that religion offers patients an opportunity to share their pain thus becoming more bearable and gain an intense sense of power. A medical practitioner named White-Hammond highlighted the experience of a 5-year-old girl who was suffering from Leukemia and stated that healing includes exercising compassion to ease pain and not necessarily save lives. Mindfulness techniques such as relaxation, meditation, yoga and prayers have both psychological and physiological changes.

MATERIALS AND METHOD

Various studies have been conducted regarding the importance of discussing with patients about their spiritual and religious beliefs. Some of the studies are directed towards the physicians' practices and opinions on asking their patients about their religious beliefs thus measuring their comfort levels when handling the topic[7, 19, 20]. This study will follow the same procedure; however, it will focus on the role of religion and spirituality in patients' healthcare.

Design and sample

This was a cross-sectional study with self-administered questionnaire mailed to patients about the role of religion and spirituality in the healthcare. The sample frame was obtained from the general practitioners and physicians practicing between 2009 and 2018 in Kitchener and Waterloo, Ontario region. The list of family physicians was obtained from the Ontario Medical Association. The sample size was 158.

The development of questionnaire

The self-administered questionnaire was organized to assess how the patient's religious beliefs helped me in their recovery or coping with their illness. It also assessed how they felt when the family physicians discussed with them about their spiritual beliefs during their office visits. The questions were drafted based on the previously conducted studies' literature search although they did not indicate any authenticated questionnaire[7].

Data collection

The self-administered questionnaires were distributed using a revised Dillman method thus increasing the response rates of the mailed questionnaires to the patients[21]. Together with the mailed questionnaires was a stamped return envelope and a reminder postcard was sent to non-responders two weeks later. Additionally, a second set of questionnaire and a stamped envelope was sent again five weeks later followed with final reminder postcard in the ninth week.

Variables and data analysis

The 5-point Likert scale consisting of variables such as never, rarely, sometimes, most of the time and always was used to measure the role of religion and spirituality in the medicine and healthcare of patients. The independent variables consisted of patients' demographic characteristics, their religious and spiritual beliefs, and their opinion on the role of religious beliefs on their healthcare as well as the frequency of discussing their beliefs with their family doctors. The 1-way ANOVA that analysis variance and *t* tests was used to carry out bivariate analyses as appropriate. The Multiple linear regressions were used to conduct multivariate analysis on the role of religious beliefs, frequency of their discussion with their physicians. In the bivariate analysis, the independent variables were statistically significant ($p \leq 0.05$).

RESULTS AND DISCUSSION

Out of the 158 questionnaires that were mailed to patients, 140 returned thus, a response rate of 88.6%. The patients responded differently to the five questions that were provided. For example, 140 provided their demographic details, 130 provided the number of years they have been sick while 115 indicated they were spiritually inclined and confirmed that religious and spiritual beliefs helped them to cope with their illness while 25 felt religious beliefs have no connection with health care and recovery. However, 80 indicated to have regular discussion with their family doctors regarding their religious beliefs or pray together their office visits. Additionally, the only similarity between the 18 non-respondents and respondents is that they were of the same gender but there was no other similarity in terms of variable was established. Approximately 51.4 percent of the respondents were female. Age ranged from 27 to 70 and their mean was 48.9 and standard deviation (SD) of 9.5 years. The patients had been sick between 2 to 42 years, thus a mean of 20.8 and SD of 10.3 years. 82.1% were spiritually focused and relied on their spiritual beliefs to cope and maintain a positive outlook. They participated in pastoral programs, attended seminars, yoga program or counseling programs. The patients were Christians, Muslims or Buddhists. 57.1% discussed with their family doctors their religious beliefs, prayed together or shared a scriptural thought together or received a recommendation of pastoral and counseling programs. However 42.9% did not discuss with their family doctors any religious matter because of varied reasons such as the perception that religious and spiritual beliefs were personal matter, they were not relevant to the healthcare, there was limited time for such discussions or the family doctors were either not religiously inclined or had a different religious background. Thus the patients and the physicians were reluctant to share their religious or spiritual beliefs. The multivariate analysis, 6 factors were statistically significant in the bivariate analyses and were thus included in the analysis of multiple linear regressions**.** The importance level of religion and spirituality *($p<0.001$)* and the patients opinion on the role of religion and spirituality in the health care of a person *($p=0.01$)*. The study indicates that it is important for the patients to have religious and spirituality beliefs because it helps them in their recovery and to cope with their illness. There are some studies that support the discussion of the religious and spiritual beliefs with their patients [22]. This study confirms too that religious ad spirituality contribute significantly to the well-being of the patient. Thus the family doctors should take an interest in the discussion with their patients about their spiritual beliefs because it enhances their recovery and coping with terminal illnesses or any other form of diseases.

Table 1. Example of quotes.

Category	Example quote
Improvement in patient's health and wellbeing	"When in pains and aches or whatever, Pray to God and will He relieve it" [14]
Disease management and decision-making	"Pray when scared, and ask God for wisdom, understanding and insight when making decisions." [15]
Prayers for others	"Focus on praying for your family members, friends as well as other loved ones because they love and need you too." [16]

Table 2. Demographic characteristics of the respondents: N=140

Gender	
Male (%)	Female (%)
48.6 (68)	51.4 (72)
Ages in years (percentage)	
< 40	20 (14.3%)
41- 50	40 (28.6%)
51-60	36 (25.7%)
≥ 60	44 (31.4%)
Number of years of being sick : N= 130	
< 10	22 (16.9%)
11 - 20	49 (37.7%)
21 - 30	31 (23.8%)
≥ 30	28 (21.6%)

Table 3. Factors statistically significant in the bivariate analysis.

Factors	**B coefficient**	***P* value**
Demographic details		
Gender	0.023	0.761
Age	0.021	0.789
Opinion on having religious and spiritual beliefs		
Importance of spirituality	-0.116	0.138
Role of religious and spirituality beliefs o health care and medicine		
They help in recovery and coping	0.277	0.001
Importance of discussing with family health care		
importance to discuss	0.010	0.905

CONCLUSION

Religion and medicine was initially closely linked together and was offered by the same person. However during the Renaissance era the two subjects parted ways because of the widening gap in the understanding of body and mind. However, various studies indicate that spirituality and religion is important in the recovery of the patient because it helps them to find the purpose of their life. Many patients have been prayed for either knowingly and unknowingly and have positive outcome. Many popular presses have published articles that show the linkage between medicine and spirituality. Medical schools in America have also incorporated spirituality and faith related courses in their programs. The study on the 158 patients gathered 88.6 % responses and out of the 140 who responded 115 indicated that they possessed some spirituality and religious beliefs opinion and were important in coping with their illnesses and maintenance of a positive outlook in life. On the other hand, 11.4 % felt spirituality is not linked to their recovery and medication was sufficient in their recovery. However, 57.1 % of the physicians have a regular discussion with their patients about their religious beliefs as well as pray together with them when they visit their offices. Therefore, spirituality and faith courses should be included in the medical curriculum to reinforce the practitioners comfort levels thus increase such interactions. This will enable them to engage patients on such topics because they play an important role in the patients' medicine and healthcare.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Ministry of Public Health, Maysan Health Department, Maysan governorate, Iraq and all experiments were carried out in accordance with approved guidelines.

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Analysis of the Association between Sebum Levels and Staphylococcus Epidermidis Infection Identified by PCR in Comedonal, Papular, and Nodular Acne Vulgaris

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ABSTRACT

Acne vulgaris is a common inflammatory disease of pilosebaseous follicles. This study aims to determine the relationship between sebum levels and Staphylococcus epidermidis infection in patients with acne vulgaris through PCR. The study was conducted in Dr. Wahidin Sudirohusodo Hospital, several network hospitals, and several high schools in Makassar City from May 2016 to June 2016. The study used cross sectional research design. The samples were patients aged 15 – 25 years, with mild, moderate, or severe type of acne vulgaris who came to the dermatovenereology clinic of Wahidin Sudirohusodo Hospital, other network hospital, and several high schools around Makassar City. A total of 45 subjects were identified and were divided into three equal groups each consisting of 15 subjects with mild, moderate, and severe acne, respectively. Samples from comedonal, papulopustular, and nodular lesions were taken followed by examination for Staphylococcus epidermidis infection. The results showed a quite high incidence of Staphylococcus epidermidis infection in acne vulgaris patients, with positive PCR results in 32 out of 45 samples, while 12 samples showed negative PCR results, suggesting Staphylococcus epidermidis as a dominant bacteria in such disease.

Keywords: *Acne Vulgaris, PCR, Staphylococcus epidermidis*

INTRODUCTION

Acne vulgaris is a chronic and multifactorial skin condition which predominates in patients aged 11 – 30 years. The characteristics of this disease include open and closed comedones, papules, nodules, and cysts which, in mild type are located on the face and around body in severe type. The condition may then be followed by post inflammatory pigmentation that may give rise to adverse psychosocial effect. Hence, acne vulgaris is one of the most common reasons to visit dermatologists.[1]

Acne is formed in hair follicles of skin consisting dead cells. The accumulation of such cells together with hyperkeratosis retention and an increase in sebum production lead to the formation of comedones (follicles blocked by sebum, keratin, and normal flora), which was then followed by inflammation. The normal bacteria inside the follicles is known as *Staphylococcus epidermidis*. It is not a pathogen but is involved in acne development. The gathered bacteria will release proinflammatory mediators that cause papules and pustules formation that may worsen the condition. These papules and pustules can develop into nodules and cysts which will be a concern for the dermatologists.[2] The classification is based on comedonal, papulopustular, and nodulocystic types. Pustules and cysts are considered inflammatory types.

A previous study conducted by Dhillon et al in India aimed to detect bacterial agents behind acne vulgaris through culture examination and followed by the evaluation of broad spectrum antibiotic sensitivity.[3] The samples were collected from nodulocystic and pustular lesions of 50 subjects aged between 18 and 27 years. The

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microorganisms found from the lesions in both aerobic and anaerobic conditions included *Propionibacterium acne, Micrococcus spp, Staphylococcus epidermidis,* and *Staphylococcus aureus.* Different bacteria were discovered from different types of lesions that were cultured in different conditions in both males and females. In an aerobic condition, the incidence of *Staphylococcus aureus*, *Staphylococcus epidermidis, Propionibacterium acne,* and *Micrococcus spp infection* were 45%, 49%, 0%, and 45% respectively. Meanwhile, the culture from anaerobic condition showed 41% *Staphylococcus aureus* infection, 20% *Staphylococcus epidermidis* infection, 32% *Propionibacterium acne* infection and none of *Micrococcus spp* infection. Regarding antibiotic sensitivity, it was found that *Propionibacterium acne, Staphylococcus epidermidis* and *Staphylococcus aureus* infection tended to be more sensitive to Rifampisin. It was revealed that the effect of the combination between Clindamycin and Benzoil Peroxide was not superior to Rifampicin alone. The study also showed different effects of antibiotics to isolated bacterial from pustular and nodulocystic types.

Another study in Brazil examined *Staphylococcus epidermidis* which carried biofilm-producing genes through multiplex PCR examination.[4] The study used 18 reference strains and 149 clinical Staphylococcus strains and aimed to identify *Staphylococcus epidermidis* and its three gene sequence: recN for recombinant protein coding, mecA for methicillin resistance, and icaAB for biofilm formation. Amlicons from 219 bp (S. epidermidis-recN gen), 154 bp (mecA gen), and 546 bp (gen icaAB) were obtained. The result revealed that the multiplex PCR approach was beneficial for an accurate identification of methicillin-resistant *Staphylococcus epidermidis* which is capable of producing biofilm.

The objective of this study is to evaluate the assosiation between sebum levels and *Staphlococcus epidermidis* infection using PCR method.

MATERIALS AND METHOD

Location and Time

The study was conducted in the dermatovenereology clinic at Wahidin Sudirohusodo Hospital, Hasanuddin University teaching hospital, several high schools around Makassar, South Sulawesi, Indonesia, and Hasanuddin University teaching hospital laboratory from May to June 2016.

Study Design and Variables

This study used a cross sectional research design. The variables examined consisted of independent variables (endogenous and exogenous factors), dependent variables (mild, moderate, and severe acne vulgaris), and intervening variables (sebum level and *Staphylococcus epidermidis* identification).

Population and Samples

The population of this study was female aged 15-20 years with mild, moderate, or severe acne vulgaris who came to the dermatovenereology clinic at Wahidin Sudirohusodo Hospital, Hasanuddin University teaching hospital, and several high schools around Makassar City. Subjects who did not receive retinoids, antibiotics or anti-inflammatory drugs in the last one month were assessed for acne severity with the Lehman Criteria and classified into mild, moderate, or severe acne vulgaris.[5]

Data Collection

Sebum level was measured using Sebumeter SM 815 (Courage & Khazaka Electronic Co, Cologne, Germany). The plastic film from the device was applied to the skin for 30 seconds to allow the sebum to be absorbed; which was then analyzed by the photometer inside the device.in $\mu g/cm^2$.

Specimens obtained from comedonal, papulopustular, and nodular lesions from patients with acne vulgaris were evaluated for the presence of S. epidermidis by using PCR (Biorad ®, California, USA) examination the following primer sequence; forward (PR 264): 5-GCA GGC AGA GTT TGA CAT CC-3, reverse (PPA.R): 5-ATG TTG AGG GCG GTG ACG TT-3, and target ban 334 bp. Informed consent from each subject has been previously acquired.

Data Analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS) 18.0 for Windows (SPSS Inc. Chicago, IL, USA). All results were presented in tables and graphs. The Mann-Whitney test was used and significant results were denoted by a p-value of < 0.05 with 95% CI.

RESULTS

A cross sectional study was conducted to identify the association between sebum levels and *Staphylococcus*

epidermidis infection in acne vulgaris using PCR method. The study was done in the dermatovenereology clinic at Wahidin Sudirohusodo Hospital, Hasanuddin University teaching hospital, several high schools around Makassar City, and the laboratory at Hasanuddin University teaching hospital from May to June 2016. There were 45 female participants with mild, moderate, and severe cases of acne vulgaris.

Table 1. Differences of PCR Results between the Mild, Moderate, and Severe Acne Group

Group	Positive	Negative	P-value
Severe Acne	5.122[a]	8	0.744
Moderate Acne	5.476	8	0.706
Mild Acne	.381	1	0.537
Total	46		

Note: Chi-Square Test

There was no significant difference in *Staphylococcus epidermidis* infection between lesions from mild, moderate, and severe acne vulgaris lesions (Table 1). However, sebum levels between the three grades of acnes differed significantly ($p<0.05$). P-values of those in mild-moderate group, mild-severe group, and moderate-severe group were <0.001, 0.005, and 0.005 respectively (Table 2).

Table 2. Distribution of Association between Sebum Levels and *Staphylococcus epidermidis* Infection in Different Grade of Acne (Mild, Moderate, Severe)

(I) Acne	(J) Acne	Mean Difference (I-J)	Std. Error	Sig.
dimension3	Moderate	231,34167*	16,03518	,000
	Mild	279,20000*	16,29176	,000
dimension3	Severe	-231,34167*	16,03518	,000
	Mild	47,85833*	16,03518	,005
dimension3	Severe	-279,20000*	16,29176	,000
	Moderate	-47,85833*	16,03518	,005

*. The mean difference is significant at the 0.05 level.

It was found that the sebum levels were significantly associated with acne vulgaris grade (mild, moderate, severe) ($p<0.001$). Meanwhile, *Staphylococcus epidermidis* infection was not assosiated with acne vulgaris grade ($p=0.439$) Table 3.

Table 3. Distribution of Sebum Levels and *Staphylococcus epidermidis* Infection through PCR

			Acne	PCR	VAR00009
Spearman's rho	Acne	Correlation Coefficient	1,000	-,117	-,841**
		Sig. (2-tailed)	.	,439	,000
		N	46	46	46
	PCR	Correlation Coefficient	-,117	1,000	,020
		Sig. (2-tailed)	,439	.	,897
		N	46	46	46
	VAR00009	Correlation Coefficient	-,841**	,020	1,000
		Sig. (2-tailed)	,000	,897	.
		N	46	46	46

**. Correlation is significant at the 0.01 level (2-tailed).

Staphylococcal infection was found in 9 cases of severe acne vulgaris (28.1%), 12 cases of moderate acne vulgaris (37.5%), and 11 cases of mild acne vulgaris (34.4%) Table 4.

Table 4. Distribution of the Association between *Staphylococcus epidermidis* Infection and Acne Grading System (Mild, Moderate, Severe)

Positive Negative			**PCR**		**Total**
Acne	Severe	Count	9	6	15
		% within Acne	60,0%	40,0%	100,0%
	Moderate	Count	12	4	16
		% within Acne	75,0%	25,0%	100,0%
	Mild	Count	11	4	15
		% within Acne	73,3%	26,7%	100,0%
Total		Count	32	14	46
% within Acne			69,6%	30,4%	100,0%

DISCUSSION

This study showed that the incidence of *Staphylococcus epidermidis* infection in patients with acne vulgaris was quite high. There were 32 out of 45 samples with positive PCR results for *Staphylococcus epidermidis* and 12 out of 45 with negative results.

The data showed that there was no significant difference in PCR examination between the mild,

moderate, and severe acne vulgaris patients. This study aims to identify *Staphylococcus epidermidis* infection associated with three gene sequences: recN for recombinant protein coding, mecA (methicilin resistance) and icaAB for biofilm formation. Amplicons from 219 bp (S. Epidermidis-recN gene), 154 bp (mecA gene), and 546 bp (icaAB gene) were obtained. The results that achieved 100% of strain were then evaluated showing that the new multiplex PCR approach can benefit to accurately identify methicillin-resistant *Staphylococcus epidermidis* due to its potential for biofilm formation.[4]

The age distribution of subjects consisted of 33 patients aged 15-16 years and 12 patients aged 17-18 years. Based on this data, it was suggested that adolescents are more prone to have acne compared to the other age. The initial lesion starts to be visible at the age of 8-9 years and approximately in more than 50-60 % juveniles.[6] The prevalence of acne vulgaris in adolescence is around 80-85% with its peak incidence is between the age of 15 and 18 years old, 12% in women aged more than 25 years and 3% in those who aged 35-44 years. 58% cases is affected those who aged 15-25 years. According to many studies, mostly the disease affects subjects who are 18-25 years old. Another also suggested the age of 12-39 years is the most common one.[7]

Meanwhile, the sebum levels of those with had mild, moderate, and severe acne vulgaris differed significantly. As we know, increased sebum level is one of the pathogenesis of acne formation. There are many ways to measure sebum level in skin such as gravimetric method using white film, cigarette paper method, photometric, and sebumetric. The parameter used to quantify sebum excretion is casual level (CL), defined as the amount of sebum per unit skin. [8, 9]

CONCLUSIONS AND SUGGESTIONS

The available data suggests that acne grading is associated with sebum concentration, both from the significance and empirical aspect. The incidence of *Staphylococcus epidermidis* infection was higher in the mild, moderate, and severe acne vulgaris compared to other bacteria such as *S.aureus, Bacillus, Bacillus,sp, Enterobacter*. However, it was not found to be significantly associated with acne vulgaris severity. Future related study is needed to compare the identification of *Staphylococcus epidermidis* between PCR and microbiological culture.

Conflict of Interest : None

Source of Funding : Hasanuddin University

Ethical Clearance: Obtained from Medical faculty committee, Hasanuddin University

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The Influence of Diabetic Foot Gymnastic to Body Balance in Elderly Diabetes Mellitus Patients in Gatoel Mojokerto Hospital Diabetic Club

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ABSTRACK

Diabetes mellitus suffers from insulin deficiency which inhibited the transfer of glucose to cells in body tissues that cause starvation cells an in the increase in glucose in the blood that leads to muscle weakness thus disrupt the body's balance and increase the risk of falling. Diabetic foot exercises aim to improved blood circulation in the feet of people with diabetes mellitus, so that nutrient smoothly to the network. The purpose of this study to determine the effect of diabetic foot gymnastics on body balance elderly people with diabetes mellitus in Diabetic Club Gatoel Hospital Mojokerto in the 27 February – 25 March 2017. This research used a Quasy Experimental method with Pretest-Posttest with Control Group Design. The sampling technique used Simple Random Sampling with the sample of 17 respondents for the control group and 17 respondents for the intervention group. Wilcoxon Signed Rank Test obtained p-value 0,000 < 0,05 concluded that there is an influence of diabetic foot exercises on body balance in elderly people with diabetes mellitus in Diabetic Club Gatoel Hospital Mojokerto. The study recommended that elderly people with diabetes mellitus is expected to take advantage of diabetic foot exercises as an effort to improve the balance of the body to reduce the incidence of fall.

Keywords *: diabetic foot exercises, body balance, diabetes mellitus*

INTRODUCTION

Elderly is a part of family members and communities that are increasing in number in line with increasing life expectancy. The older a person, he will experience a setback, especially in the field of physical ability, which can lead to a decrease in social roles that lead to dependence. In old age, a good balance is needed by someone in supporting their daily mobility.[1,2]

The prevalence of diabetes mellitus based on physician diagnosis and symptoms increases with age, in East Java (2.5%) and increases in age 55-64 years (5.5%). In Mojokerto City the percentage of the elderly population was (9.94%), with th e percentage of men (9.26%) and women (10.62%) and an estimated 20% of elderly people suffered from diabetes mellitus. (BPS East Java Province, 2015). Based on the results of a preliminary study on December 6, 2016, at 11.00 WIB in the Diabetic Club of Gatoel Mojokerto Hospital, there were 50 elderly people with diabetes mellitus who received gymnastics. And there are 10 elderly diabetics who complain of foot tingling and numbness.

Diabetes mellitus is a major risk factor for impaired lower limb function, balance disorders, and mobility. Compared to other elderly people, the risk of physical limitations is 2-3 times that of elderly people with diabetes mellitus, and this risk is greater in women. The impact of all this is that more elderly women with diabetes mellitus experience falls and fractures. Balance in the elderly also experienced a setback. The existence of a balance disorder in the elderly will cause falls in the elderly[3,4]. In addition, other researchers regarding the influence of elderly gymnastics on body balance in the elderly in the Dajan Bingin Sading environment showed

a significant change between the balance of the elderly body before and after being given gymnastics for 35 minutes in the afternoon for four weeks. This is evident from the improvement of the balance of the elderly body after being given gymnastics for the elderly[5,6]. In addition, hatha yoga modification training and tai chi exercise can also improve balance.

Physical exercise of diabetic foot exercises keeps it moving because by moving indirectly it will keep the muscles and joints to regulate the balance of both legs and strengthen joint muscles in order to reduce the risk of falling in the elderly with diabetes. and the risk of other complications[7]. Diabetic foot exercises are carried out 2-3 times a week for 15 minutes to get effective results.[8,9]

The research objective was to analyze the effect of diabetic foot gymnastics on the body balance of elderly people with diabetes mellitus in the Diabetic Club of Gatoel Hospital in Mojokerto.

MATERIALS AND METHOD

This research was conducted using the experimental Quasy design with Pre-Posttest design with Control Group Design. This research was conducted at the Diabetic Club of Gatoel Mojokerto Hospital on 27 February - 25 March 2017. The population in this study were 50 elderly people with diabetes mellitus in the Diabetic Club of Gatoel Mojokerto Hospital and sampling techniques with Simple Random Sampling as many as 17 samples respondents for the control group and 17 respondents for the intervention group.

Measurements were carried out in two ways, namely pretest and posttest, a pretest was before being given diabetic foot exercises using Berg Balance Scale (BBS) and posttest was given diabetic foot exercises using Berg Balance Scale (BBS) 2 times a week for 4 weeks.

RESULTS

Table 1. Distribution of Pretest Body Balance Frequency in Control Groups and Intervention Groups

Based on table 1. shows that the pre-test in the intervention group more than 50% of respondents have a good body balance that is 10 respondents (58.8%). Whereas in the pre-test control group, the majority of respondents had a good body balance as many as 11 respondents (64.7%). Based on the research data, the body balance of respondents with diabetes mellitus before intervention tends to be in the medium category.

Table 2. Distribution of Posttest Body Balance Frequency in Control Groups and Intervention Groups

	Group	Body Balance						Total	
		Good		Medium		High			
		F	%	f	%	F	%	F	%
Post Test	Control	10	58,8	6	35,2	1	6	17	100
	Intervention	15	88,2	2	11,8	0	0	17	100
	Total	25	73,5	8	23,5	1	3	34	100

Based on table 2. shows that in the intervention group almost all of the post-test respondents have a good body balance that is 15 respondents (88.2%). Whereas in the control group most of the respondents in the post-test had good body balance (58.8%). Based on research data it was found that respondents who did diabetic foot exercises 2 times a week experienced a significant increase in body balance compared to respondents who did not do diabetic foot exercises.

Table 3. Frequency Distribution of the Effects of Diabetic Foot Gymnastics on Body Balance in the Elderly Patients with Diabetes Mellitus in the Diabetic Club of the Gatoel Mojokerto Hospital on February 27 - March 25, 2017

No.	Body Balance	Control				Intervention			
		Pre Test		Post Test		Pre Test		Post Test	
		f	%	f	%	f	%	f	%
1.	Good	11	64,7	10	58,8	10	58,8	15	88,2
2.	Medium	4	23,5	6	35,2	6	35,2	2	11,8
3.	High	2	11,8	1	6	1	6	0	0
	Total	17	100	17	100	17	100	17	100
	p *value*	Uji *Wilcoxon Signed Rank Test* = 0,131				Uji *Wilcoxon Signed Rank Test* = 0,000			

Based on table 3. using the Wilcoxon Signed Rank Test test in the control group with a significance value of 0.131> 0.05 indicating that there is no effect of diabetic foot gymnastics on body balance in elderly diabetics in the Diabetic Club of Gatoel Hospital in Mojokerto. While the Wilcoxon Signed Rank Test test in the intervention group with a significance value of 0.000 or p <0.05, which means that H1 is accepted means that there is an effect of diabetic foot gymnastics on body balance in elderly people with diabetes mellitus in the Diabetic Club of Gatoel Hospital in Mojokerto.

DISCUSSION

1. Body Balance Before Given Diabetic Foot Gymnastics in the Control Group and Intervention Group

A speed of reaction time, relaxation and functional work. Furthermore, decreased function and muscle strength will result in a decrease or decline in the ability to maintain body balance. Obstacles in sitting motion to standing increased the risk of falls, changes in posture. Problems with the ability to move and function, are closely related to muscle strength that is individual in the elderly[10]. With sports such as jogging, running, lifting weights, badminton, tennis or other sports will maintain the bone density of the elderly. In addition, exercise can also strengthen the muscles of the elderly and help balance the posture so that the possibility of fracture (fracture) is smaller[11]. Patients with diabetes mellitus have characteristics of hyperglycemia, high blood sugar levels cause various disorders of the somatosensory system (visual, vestibular, proprioceptive) and motoric (musculoskeletal, muscle, soft tissue joints) which can interfere with the balance system thereby increasing the risk of falls. In addition, diabetics have insulin deficiency which inhibits the transfer of glucose to cells in body tissues which causes cells to starve and an increase in glucose in the blood. This creates obstacles in perfusion to muscle tissue which will result in muscle tissue getting less oxygen and nutrients which causes cells to lack the material for metabolism so that the energy produced decreases which result in the onset of weakness and can further result in muscle atrophy. Muscle weakness causes interference in static and dynamic body balance. These disorders will cause the body to falter and become unstable, increasing the risk of falls and fractures[12].

Physical activity can be done at leisure, the scope of work, and daily routine activities such as homework, gardening, hobbies, recreation, and sports[13]. This is reinforced by the opinion of Lord, et al which states that the average incidence of falls in elderly women is 40% while men 38% and will continue to increase at the age above 65 years. This event can be caused by reduced muscle strength in elderly women and lack of ability of elderly women to restore body stability. Elderly women also experience muscle weakness in the lower extremities so that they cannot support their weight.

The results of the analysis of the researcher, respondents who participated in this study were aged 60-74 years old who had entered the elderly but were

still active in gymnastics activities and the majority of respondents were mostly female. The risk of physical limitations in elderly people with diabetes mellitus is greater in women, the same effect is that more elderly women with diabetes mellitus experience falls and fractures.

2. Body Balance After Given Diabetic Foot Gymnastics in the Control Group and Intervention Group**.**

Based on the research data in table 2. it was found that almost all respondents in the treatment group experienced an increase in body balance to be good, namely 15 respondents (88.2%) while almost half of the respondents in the control group had a moderate body balance, namely 6 respondents (35.2%). This means that respondents who did diabetic foot exercises 2 times a week experienced a significant increase in body balance compared to respondents who did not do diabetic foot exercises.

The results of this study are in line with the research in Switzerland by Rocher cited by Wibisono in patients with diabetes mellitus with neuropathy, the results of irregular exercise research are at risk of developing diabetic ulcer 4 times higher than regular exercise[14]. The results of this study are consistent with a statement explaining that the physiological effects of foot exercises routinely will achieve simultaneous or separate effects. Therefore, diabetic foot exercises that are carried out regularly and in a balanced manner can have a positive impact on elderly people with diabetes mellitus, especially those who experience body balance disorders.

3. The Effect of Diabetic Foot Gymnastics on Body Balance in the Elderly Patients with Diabetes Mellitus in the Diabetic Club of Gatoel Hospital in Mojokerto.

The results of the analysis of the researchers, the increase in body balance from the medium to good after diabetic foot exercises in elderly people with diabetes mellitus in the intervention group in the Diabetic Club of Gatoel Hospital in Mojokerto was due to the respondents doing diabetic foot exercises correctly and regularly according to the movements determined by the frequency of exercise 2 times a week for less than 10-15 minutes in 8 weeks. Diabetic foot exercises physical exercise is able to keep it moving because by moving indirectly it will maintain the muscles and joints to regulate the balance of both legs and strengthen joint muscles as a way to reduce the risk of falling in the elderly and the risk of other complications.

CONCLUSION

Based on the results of the discussion about the effect of diabetic foot gymnastics on the balance of the body between groups that apply diabetic foot exercises and not in elderly diabetes mellitus can be concluded that :

The balance of the body before being given diabetic foot exercises in the control group and the intervention group in the elderly with diabetes mellitus in the Diabetic Club of Gatoel Mojokerto Hospital tend to be in the medium category.

The balance of the body after being given diabetic foot exercises in the control group and the intervention group in the elderly with diabetes mellitus in the Diabetic Club Gatoel Mojokerto Hospital experienced an increase from the moderate to the good category in the intervention group.

There is an effect of diabetic foot exercises on body balance in elderly people with diabetes mellitus in the Diabetic Club of Gatoel Hospital in Mojokerto.

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Conflict of Interest : None

Ethical Clearance : obtained from STIKIP PGRI Pacitan

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The Model of Supervision for Impermanent Food Sellers by Women Volunteer in Kendari City Indonesia

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ABSTRACT

Objectives: Many fast food sellers emerged in Kendari city of Southeast Sulawesi Province Indonesia. The number of staff in Environmental division in Primary Health Services was limit, so they could not supervise for all fast food sellers in that area. Therefore, involving of women volunteer in the villages of Kendari City was necessary. Therefore, this study aimed to find out the model of supervision for impermanent food sellers by the women volunteers in Kendari City, Southeast Sulawesi Province in Indonesia.

Methods: This study used Quasy Experiment with the One-Group Pre-test-Post-test Design. The study was conducted in 3 villages in Kendari City. This study recruited 17 women volunteers and 39 fast food sellers. The statistical analysis used linier regression.

Results: The model of supervision under the women volunteers could be found in this study. The characteristic of women volunteers which involved and be active to supervise were they who have be active in social activities in their village. They have also been involved in Primary Health Services in the village for more than 6 years, they were above 41 years old. They were married and had 3 children in average. Each village involve about 4-10 women. Each village was organized by 1 person as a village coordinator. The village coordinator had responsibility to communicate or mediate to primary health services, especiallay to environmental division. Every month the coordinator reports the results of women's supervision for the fast food sellers. The time of reaching the fast food sellers was found to be significant relation with the seller's behavioural change and fast quality improvement.

Conclusion: Women volunteers can supervise to the fast food sellers in kendari City in southeast Sulawesi Province, Indonesia. They have closed with the food sellers and with sanitation and environmental staff in primary health service.

Keywords: *Women volunteer, Fast food, Supervision, Food seller*

INTRODUCTION

Insecure food remains globally crucial issue, including in Kendari City of Southeast Sulawesi Province, Indonesia. As reported by Kendari City Health Department[1], there were about 176 food sellers (20.21%) who were insecure in Kendari City in 2015. This number was the highest compared to other districts, such as South Buton (7.19%) and North Konawe (10,09%)[1]. That condition has increased the incidence of diarrhoea and hypertension in Kendari City. In 2015, the incidence of diarrhoea in Kendari city was about 63,28%[1]. This incidence was higher than North Konawe (6,64%) and Wakatobi (15,87%)[1]. While the prevalence of hypertension were also higher (14,83%) compared to 7.15% of Bau-Bau city in 2015[1]. To reduce the negative effect of hazardous food in the public places, so the government applies several strategies as

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described in the strategic planning inn 2015-2019. The strategies include collaborated programs between the producers, governments, non-government organization and communities[2]. Because the fast food sellers were huge, while there were a few health workers in Kendari City Health Department, so communities had big responsibilities to involve in controlling the fast food which were sold in the public places. However, the community involving model is unclear. Therefore, understanding the model of community involvement in the fast food control is necessary in Kendari city. Based on that phenomenon, the aim of this study is to find out the model of community involvement in controlling to fast food sellers in Kendari city to increase the quality of food hygiene and sanitation.

MATERIAL AND METHOD

Research Design

This study applied a Quasy Experiment method using The one-Group Pretest - posttest Design as described below.

notes:

0_1 : Pre-test

X : treatment from communities as controller and educator

0_2 : Post-test

Pre-test	Treatment	Post-test
0_1	X	0_2

notes:

0_1 : Pre-test

X : treatment from communities as controller and educator

0_2 : Post-test

Figure-1. The Quacy-Experiment method using The One-Group Pretest-posttest Design

The Study Site and Time

This study was conducted in Andonohu, Rahandauna and Wundumbatu villages in Kendari City. This study was conducted from February to July 2018.

The Population and Samples

a. Population

The population of this study were all of the fast food sellers in Kendari City namely 119 sellers.

b. Sample and sampling technique

This study recruited 39 fast food sellers in 3 villages in Kendari City with 5% of error tolerance. The samples were selected with using the purposive sampling. The inclusive criteria of sampling technique included the sellers were included in 3 villages, the fast food sellers and there were civil communities who willing to control the fast food sellers.

Data collection

Data was collected through in-depth interview, observation and laboratorial test of food sample. The interview was purposed to the fast food sellers, women volunteer, health workers in Health Department of Kendari City and Poasia Primary Health Care Services.

Data analysis

The data was analysed through descriptive and inferential analysis. The descriptive analysis produced distribution of each variable such as the characteristic of

women volunteers, the model of the fast food supervision. The inferential analysis was proposed to understand the relationship between the time of supervision and the food seller's behavioural change to the quality improving of the food hygiene and sanitation. The statistical analysis used linier Regression.

RESULTS

Characteristic of Women volunteers

This study identified 17 women volunteers who could take supervision to the fast food sellers in Andonohu, Rahandauna and Wundumbatu Villages of Kendari City. The characteristic of women volunteers who actively involved in this study is presented in this below table.

Table-1. The Women volunteers' characteristic who involved in the Fast food control in Andonohu, Rahandauna and Wundumbatu Villages of Kendari City

characteristics	Number	Percentage
Education:		
Primary School	1	5.9
Junior High School	3	17.6
Senior High School	9	52.9
Diploma/ Bachelor/Post graduate	4	23.5
Age: (year): mean (±) 1 SD*	41.5 ±7.3	
30 - 34	2	11.8
- 39	5	29.4
40 – 44	7	41.2
45 – 49	2	11.8
> 50	1	5.9
Occupation:		
No working	12	70.6
Private/ trader	3	17.6
Teacher	1	5.9
Civil servant	1	5.9
Number of children: mean (±) 1 SD*	3 ± 1.3	
One	1	5.9
Two	7	41.2
Three	4	23.5
Four	1	5.9
Five	4	23.5

SD*= Standard Deviation

The time of reaching to the fast food sellers behaviour and the quality of fast food.

Table-2. The time of reaching to the Fast Food Sellers in 3 Village of Kendari City in 2018

	Number	Percentage (%)
The time to reaching to the food seller (minute): mean (±) 1 SD*	6.7 ±3.2	
< 4	4	23.5
5 – 9	8	47.1
10 – 14	3	17.6
15 – 19	1	5.9
20	1	5.9

SD*= Standard Deviation

Table.3. The Seller's Behaviour and the Quality of fast food Hygiene and Sanitation between before and after women volunteer supervision for the Fast Food Sellers in Kendari City

Category	Before		After	
	n*	%	n*	%
Poor	0	0	0	0
Medium	10	25.6	3	7.7
Good	29	74.4	36	92.3
total	39	100.0	39	100.0

n* : Number of fast food sellers

Table 4. The relationship between the time of reaching to food seller be women volunteers and the food seller's bahavior and food quality improving

Model	Unstandardized coefficients		Standardized Coefficients	t	Siq	95% confidence Interval for B	
	B	Std.error	Beta			Lower Bound	Upper Bound
The time of reaching to food seller (minute)	2.947 -.175	.951 .128	 -.219	3.097 -1.366	.004 .180	1.019 -.434	4.875 .084

Note: Linier Regression result

DISCUSSION

This study showed the women volunteer could supervise the fast food sellers in 3 villages in Kendari City. This can be explained that the women volunteers can help Poasia Primary Health Care Services especially for environmental division. As identified that the women volunteers who were active in social activities in their village. They have been trained by Poasia Primary health care services [3]. The women volunteers who involved in this study have been the health volunteer about 6.9 years in average. They have also gotten training or workshop about 9.2 times. They are given responsibility to do health planning and health promotion to the communities in their village [3]. This means they have had huge experiences, especially in community engagement towards better healthy life behaviour. Furthermore, they got support from their family member including from their husband because all of the cadres were women (94.1% of married and 5.9% of widow). Family support is reinforcing factor to determine the individual behaviour. Thus, women volunteer have high motivation to take social responsibilities[4]. As mentioned in the above table that about 52.9%, they passed from senior high school. This means they could synthesize health information which they got[5]. Women Volunteer with more higher educational level tends to have awareness about science and information[5]. Some previous study also found that individual knowledge is determinant factor of successful cadres to take their responsibility in the comprehensive community health care services in the village[6].

Furthermore, motivation is also the essential factor of successful for women volunteers. Motivation has significant relationship with human basic needs[7]. The human basic needs include physiological, safety, love, esteem and self-actualization needs[7]. This is true that women volunteer's involvement in the fast food control in this study because they want to get new experiences and self-actualization. This is based on depth interview with women volunteers. Another thing, they hope to get an incentive from Poasia Primary Health Care Centre or from their village leader. Some of them (70.6%) do not

have job. They are wives who do domestic chores only. If they got incentive such as a few money, there will be increasing their family income. Additional household income will give significantly impact for their children nutrition because they will increase their purchasing power for food[8]. Increasing in the household income also can improve their household facilities such as water and latrine facilities. The housing condition also influence significantly to their under-five children's nutrition status[9]. Some of women volunteers have under-five years' old children. Also, they can buy gasoline for their motor cycle because there are about 82.4% of them used motor cycle when they supervise the fast food sellers. This means that incentive includes in intrinsic factor which motivate the human to involve in the activity like involving in the fast food control. Other previous study also argued that women volunteers' motivation was important factor for them to be active in the social activities in their village[6].

Other important factor why they were effective to involve in the fast food control is they have lots of free time. As above mentioned that there were about 70.6% of cadres were no job. Thus, they had lots of time to involve in the fast food control. This activity took about 6.7 minutes only. Even some of cadres (29.4%) who had a job, they still could use their free time to involve in this activity. The distance between the women volunteers' home and the fast food seller is about 766 meters in average. They have 3 children in the average. Therefore, they do not have heavy burden between their responsibility in their home and in this fast food control. As we known, the wives in this culture have responsibility to child rearing including the domestic chores.

Furthermore, women volunteer have had some experiences in the previous activity could do the best approach and communication with the fast food seller. Thus, they could also give health promotion to the sellers during supervision. They were about 41.5 years old in the average. They included in the adult people who changed their interest and responsibility towards socialist people[10]. With the simple instrument of control the fast food quality, the women volunteers could show their ability to involve in the fast food control. The form includes several aspects such as about environment, the seller's behaviour towards the food hygiene and sanitation. Thus, they could give health education for the food sellers during supervision. The number of assessment (0-10) of the quality of the food hygiene and sanitation is easier for them. The number of 5 becomes the basic to determine the good or poor because this number was agreed as a middle number.

The mechanism of reporting to the environmental staff in the Poasia primary health care services also could be done by the cadre because the coordinator only who reported to the environmental staff every month. The women volunteers have become familiar with all of health staff in this primary health care service. Every Saturday morning, they also take gymnastic in this primary health care. The gymnastic is purposed to increase fitness for people who are above of 40 years old and prevent for the chronic diseases such as hypertension, stroke and others. Therefore, their involvement in the fast food control was significant effective to increase the quality of the fast food.

CONCLUSIONS

This study has explained that the women volunteer can supervise the fast food traders in Kendari city, especially in Andonohu, Rahandauna and Wundumbatu villages. They are volunteers who have gotten lots of trainings and experiences in the health promotion program by primary health care services and others. Thus, they can influence the fast food traders to change their hygiene and sanitation to manage their fast food. The women volunteers can use their free time in the social activity because they have trained to manage their time effectively.

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Resistance Status in *Aedes Aegypti* Strain from North Toraja, Indonesia to Malathion and Temephos Insecticides

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ABSTRACT

Organophosphates is the main choice in controlling *Aedes aegypti* mosquito as the main vector of Dengue Hemorrhagic Fever. This study aims to determine resistance status of *Aedes aegypti* collected North Toraja District to malathion and temephos. This type of research is a quasi experiment. Assays to determine resistance status were conducted using WHO standard method. The samples were 600 *Aedes aegypti* F1 3rd and 4th instar larvae; and adult *Aedes aegypti* F1 female mosquitoes aged 3-7 days obtained from ovitrap survey at high dengue endemic area (Rantepao sub-district) and non endemic area (Sanggalangi sub-district) in North Toraja District. The adult samples were tested to Malathion 0.8% and 5%. The larva samples were tested to Temephos 1% concentration with 3 times replication, the number of each test was 20 mosquitoes. The statistical test used is univariate and probit analysis. The results showed that *Aedes aegypti* (high endemic strain) adults was resistance to Malathion 0.8% concentration, and that was tolerance to Malathion 5% concentration, whereas *Aedes aegypti* larvae was susceptible to Temephos 1%. *Aedes aegypti* (non endemic strain) were susceptible to Malathion 0.8%, Malathion 5% and Temephos 1%. There were a difference in lethal time (LT50, LT90, LT95, and LT99) between *Aedes aegypti* high endemic and none endemic strains to both malathion and temephos. The value of lethal time of *Aedes aegypti* high endemic strain were higher than those non endemic strain

Keywords: *resistance test, malathion, temephos, Aedes aegypti*

INTRODUCTION

Aedes aegypti is a major vector in the spread of dengue virus. DHF can occur throughout the year and can affect all age groups [1,2]. According to WHO, it is estimated that the number of dengue fever cases amounts to 390 million per year, of which 96 million are serious cases. Southeast Asia, the United States and the Western Pacific are high dengue-endemic areas where 2.5 billion people or two-fifths of the world's population are at risk of contracting DHF. In Southeast Asia, Indonesia is one of the endemic countries of DHF. An estimated 500,000 people with DHF incidents require hospitalization each year and about 2.5% of them experience death[3].

Vector control using insecticides is one of the strategies in eradicating mosquitoes that are considered more effective, fast and easy [4]. Resistance occurs when a vector cannot be killed by a standard dose or a vector successfully avoids contact with an insecticide[5]. Continuous exposure to insecticides causes mosquitoes to adapt so that the number of resistant mosquitoes multiplies. The resistant mosquito can bring resistance to its offspring[6].

Salim et al[7] was found in Palembang city, that the adult stage of Aedes aegypti mosquitoes are still susceptible to malathion dose 5%. Suwito[8] found in Surabaya, that in the location with high case of dengue fever already exist mosquito population that tolerant to insecticide malahion dose 5%. Research in three municipalities of DKI Jakarta shows that Ae. aegypti has been resistant to 1% temephos insecticide[5]. Research Handayani et al[9] found in Semarang that Ae. aegypti larvae in the Tanjung Emas port in the perimeter region is already tolerant and in the buffer region has been resistant to temephos.

North Toraja is a dengue-endemic district in South Sulawesi Province. According to the North Toraja Health Office, there were 31 cases (IR = 13,84) in 2014,

increasing by 39 cases (17.29) in 2015 and increasing dramatically in 2016 with 96 cases[10]. These conditions allow the occurrence of resistance to Aedes aegypti due to the use of insecticides in fogging and abatezation in the eradication of DHF vectors. Until now, the North Toraja Health Office still uses 5% malathion insecticide in fogging and 1% temephos for abatezation.

This study aims to determine resistance status of *Aedes aegypti* collected from North Toraja District to malathion and temephos.

MATERIALS AND METHOD

Aedes aegypti was collected using ovitrap at locations representing different endemicity levels in North Toraja District, namely: high endemic (Rantepao sub-district) and non endemic (Sanggalangi sub-district). This type of research is quasi experiment.

The population in this study were all Aedes aegypti mosquitoes in high endemic areas and none endemic DHF in North Toraja District, while the samples of Aedes aegypti larvae F1 third and fourth instar amounted to 240 larvae and Aedes aegypti F1 3-5 days old was 360.

Assays to determine resistance status were conducted using WHO standard method. Testing of Aedes aegypti resistance status to the concentration of malathion and temephos refers to Bottle Bioassay test. Bioassay tests were conducted at the Entomology Laboratory of Faculty of Medicine Hasanuddin University. Primary data were obtained from observation of larvae and Aedes aegypti mosquito larvae during contact with insecticide for 1 hour observation, (as follows 5 minutes, 15 minutes, 30 minutes, 45 minutes, 60 minutes) and death within 24 hours. DHF incidence data as well as fogging and abatization program data were received from North Toraja Health Office.

Univariate analysis was done to know the frequency distribution and percentage of mosquito mortality test against malathion and temephos insecticides. Probit test was done to analyzed lethal time values (LT50, LT90, LT95, and LT99).

RESULTS

The results showed that Aedes aegypti resistance status in North Toraja Aedes aegypti high endemic area was resistant (mortality 55%) to malathion concentration 0.8%, and that was tolerance (mortality 93.5%) to malathion 5% and that was vulnerable (mortality 100%) to 1% temephos; whereas Aedes aegypti non endemic area is still susceptible (mortality 100%) to insecticide malathion concentration 0.8%, 5% and temephos 1% (See Figure 1). Table 1 shows a significant difference in Aedes aegypti mortality in high endemic and none endemic strains to malathion exposure of 0.8%, 5% and 1% temephos. The result of chi-square test for malathion insecticide 0,8%, 5% and temephos 1% had significant p value = 0,000 <0,05.

Table. 1. Chi-Square test results difference in mortality of Ae. aegypti high endemic and none endemic strains to exposure to malathion and temephos insecticides.

Concentration of insecticide	Significance
Malathion 0,8%	0,000
Malathion 5%	0,000
Temephos 1%	0,000

The lowest (55%) average Aedes aegypti mosquito mortality of endemic strain against exposure to Malathion concentrations of 0.8%; and the highest mortality (100%) of none endemic strain to Malathion exposure concentrations of 0.8% and 5%. Figure 2 shows the difference in mean percentage mortality of Aedes aegypti larvae at each time observation of 1% temephos exposure in non endemic areas higher than endemic areas up to 60-minute interval. In 1440 the average number of Aedes aegypti larvae mortality was 100% in high endemic areas and not endemic. Figure 3 shows the values of LT50, LT90, LT95, and LT99 malathion insecticides concentrations of 0.8%, 5% and 1% temephos in high endemic areas higher than non endemic areas.

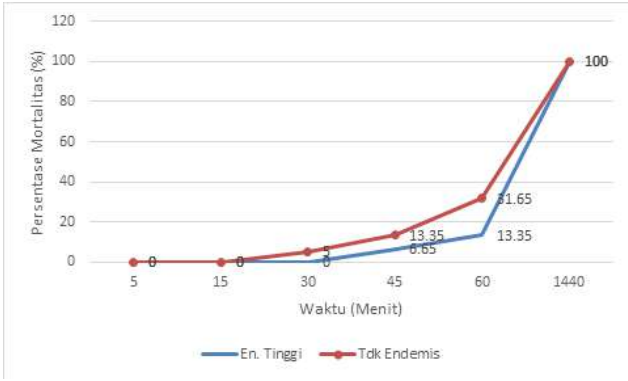

Figure 1. Average mortality of *Aedes aegypti* high endemic and non-endemic strains in North Toraja to Temephos 1%

DISCUSSION

This study shows that *Aedes aegypti* mosquitoes have been resistant to Malathion 0.8% in high endemic areas of North Toraja. The results of this study are similar with research conducted by Prasetyowati et al[5], in East Jakarta, West Jakarta and South Jakarta found that the three regions of the Aedes aegypti mosquito were resistant to Malathion 0.8%. In line with the research of Widiarti et al (2011), conducted in Central Java and Yogyakarta that *Aedes aegypti* mosquitoes were resistant to Malathion insecticides in very low concentrations of 0.8%.

This study shows that Aedes aegypti is tolerant to Malathion concentration of 5%. This result is similar to that of Suwito[8], finding that Aedes aegypti mosquito populations are already tolerant to 5% malathion. In line with Sing et al (2011) research, in Koderma, India it was found that Aedes aegypti mosquitoes had a mortality of 95.83% against malathion 5%, which means that Aedes aegypti mosquitoes at the site have been in tolerant or potential resistance category.

However, different conditions were found in several regions. Research conducted by Sundari & Orbayinah[12], in Yogyakarta found that Ae. aegypti from endemic research sites (Bogoran and Badegan) are still susceptible to malathion insecticides.

This study shows that Aedes aegypti is still susceptible to temephos 1% in high endemic areas and not endemic to North Toraja. This research is in line with research conducted by Salim et al[7], in Palembang City found that Ae. aegypti larvae stage still tend to be susceptible to temefos dose 1%. Research by Sinaga et al (2016), found that larvae Aedes aegypti from Jatiasih Village, Bekasi City, is still vulnerable to temephos. In Buah Batu Subdistrict, Bandung City, it was also found that Aedes aegypti larvae were still susceptible to 1% temephos[13].

Polson research in Phnom Penh (Cambodia) found that the difference in susceptibility of Aedes aegypti to insecticides between regions due to the different intensity and duration of insecticide use. The more frequent use of these insecticides, the faster resistance will occur[14]. This can be seen from the differences in Aedes aegypti mortality in high endemic areas and not endemic in North Toraja.

Another factor that influences the vulnerability of Aedes aegypti based on endemicity is population density. The denser an area of vector density is also increasing, the greater the potential for transmission of DHF, so the use of insecticides for vector control is also getting bigger[15].

CONCLUSION

In this study, although the concentration of 5% is still tolerant of *Aedes aegypti* mosquitoes in high endemic areas, but the lethal time value shows a long time (LT99) 1827.26 minutes (30.45 hours) or 1 day 6 hours, when associated with biting characters which is multi-biter (repeatedly bites) then with the chance to live even if only 1 day 6 hours allows mosquitoes to still be able to play a role as transmitters of the dengue virus. These results indicate that a concentration of 5% is not effective for use in high endemic areas in North Toraja.

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Can The Length of Nurse Employment Lead to Work-related Stress at Inpatient Ward in Hasanuddin University Hospital, A Teaching Hospital, Makassar, Indonesia

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ABSTRACT

Nurse is the most common stressed profession. They works with life threatening patients, emergency and stressed patients. The sources of stress can be personal, interpersonal and environment factors. Some literature stated that a new graduated nurse may feel more stressful when they work at hospital for the fist time. This condition can decrease nursing performance and become harmful to patients. However, the study of correlation between work experience and work related stress in teaching hospital is still limited. Therefore, this study will analyze the correlation between length of nurse employment and work related stress on nurse at in-patient ward in Hasanuddin University Hospital, a teaching hospital in Makassar, Indonesia. This study is a quantitative study with applied cross sectional study. This study collected information from 72 sample (total sampling). They filled in valid questionnaires regarding work related stress. The length of nurse employment was how many years of samples works as a nurse. Chi-square was applied to this study and the result showed that p value is 0,038. It means, statistically, there was a correlation between the length of nurse employment and work related stress on nurse at inpatient ward in the hospital. The shorter of the length of employment, the more stress on nurse. This fact showed that inexperienced nurse will get more stress than experienced nurse when they work in hospital. The result implies that self efficacy of graduated nurses and working environment are important to reduce their stress. Working in a good condition can improve patient safety

Keywords: *Working experience; nurse; work related stress*

INTRODUCTION

Nurse is the most common stressed profession in the world. There is a substantial evidence to support this statement. A survey in France found that work related stress on nurse was 74% of all nurses. Gong *et al.*[1] reported that in France almost 30% of nurse managers got depressed and in Canada 1 out of ten nurses were depressed due to their professions and in 2012, there were 35.28% of Nurse working in a emergency ward become stress in Iran. Gholamzadeh *et al*[2] also found that 27% nurse were suffered from psychosomatic symptom and 38% visit doctors. They work with life threatening, emergency and stressed patients. In addition, most of them have heavily workload, lack of power, role ambiguity and role conflict[3-8].

Work related stressed (WRS) can be recognised from somatic symptom such as emotional exhaustion, low back pain[9]. This condition will influence productivity of nurse, thus WRS has to be well managed, otherwise it would have impact on nurse performance, such as inefficiency, ineffectivity and the most considerable impact is patient safety. Some research showed that a lot of adverse events in hospital occurred due to burnout and occupational stressed. Nielsen *et al*[10] stated that the incidens of adverse events increased as a result of work related stress among nurses. Other studies reported that the work hour of health care workers have impact on adverse events. Some radiologist did misconduct by cause of stress syndrome[11,12.]

In a decade, the topic of WRS among health care professional has been studied seriously. Moustaka & Constantinidis[13] researched the causa of work related stress among nurses. They said that nurses had ambiquity in their task and sometimes come to conflict. They have responsibility to care patient, sometimes they have to

be a pharmacist regarding administer drugs to patients, occasionally, the nurses should be a psychology, at the same time they have to do administrative work as a result they get exhausted. This condition exist in midwife as well[14]. Other researchers has concerned counterbalancing of work related stress in intensive care unit[15]. Likewise Deklava *et al*.[16] studied stress coping mechanism and professional burn out among lativian nurse. Golubic *et al*. identified some factors can be occupational stressors, they are financial issues', 'public criticism', 'hazards at workplace', 'interpersonal conflicts at workplace', 'shift work' and 'professional and intellectual demands'. Even though nurses are the most stress profession, the number of graduated nurse growth steadily in Indonesia. Board for development and empowerment human resources of health in Indonesia reported that From 2015 the number of nurse students were 17,779, then in 2016 19..058, it increases steadily to 21.017(Indonesia 2018). It seems graduated nurse to be large workforce

Recent years, the government has development some new teaching hospitals like Hasanuddin University Hospital, it has responsibility to employ them. Nevertheless, the majority studied revealed that more novice nurse experienced stress when they start to work at hospital for the first time. Their psychosocial and psychology changed because of environmental change from education to working environment. They were lacking in self confidence in caring patients, they have to be real professionals, having new role, new friends and new regulation[17-20]

As discussed previously, it may be harmful for patients if they are handled by a novice nurse. Hence, most hospital may not recruit new graduated nurse unless they have some experience before working at their hospital. The length of employment for nurse reflects the experience of nurse. Thus, the research question is that can the length of nurse employment lead to work-related stress at inpatient ward in Hasanuddin university hospital, a teaching hospital, Makassar, Indonesia, so this study will analyze the correlation between length of nurse employment and work related stress on nurse at in-patient ward in Hasanuddin University Hospital, a teaching hospital in Makassar, Indonesia

MATERIALS AND METHOD

This study was a quantitative study with applied cross sectional study. Population is all nurses working in inpatient wards at Hasanuddin University Hospital (72 respectively). The research has been conducted for a month, during April 2017. It collected information from 72 sample (total sampling) regarding their physical symptom when they were in the working place. The change of physical sign such as the increase of pulse, heart rate, headache, palpitation, fatigue syndrome, dizziness are functional somatic syndrome (FSS) resulting from decrease quality of life, anxiety and depression. They are recognized as stress symptoms[23]. The respondents were asked to give their perception regarding their physical sign when they were working. Their perception was categorized into 4 categories: never, seldom, almost and frequently. Than, the data was analyzed using chi square test. This test was used for several reasons; 1) this study analyzed association between two variables from one population, 2) the data was categorical.

RESULTS

Table 1. Association Between The Lenght of Employment and The Work Related Stress at inpatient wards in Hasanuddin University Hospital, A Teaching Hospital, Makassar, Indonesia

The Length of employment	Work Related Stress				Total		Statistic Test
(year)	No		Yes				
	n	%	n	%	n	%	
0 – 3	4	25	12	75	16	100	**ρ = 0,038**
4 – 5	26	49	27	50	53	100	
6 - 7	3	100	0	0	3	100	

As seen in this tabel that most of nurses with the length of employment 0-3 years felt stress when they were working. However, nurses had the length of employment more than 5 years had no stress. Chi squre test showed p value = 0,038 < α = 0,05 means hyphothesis null was rejected and hyphothesis alterinative was accepted. It reflected that statistically, there is association between the length of employment and work related stress in the inpatient wards at the teaching hospital of Hasanuddin University.

DISCUSSIONS

Although this study is based on small sample in a teaching hospital in Indonesia, the result proved that the inexperience nurse had more stress than experience nurse when they worked at teaching hospital. The symptom of stress can be determined from their answer. Most of nurses had worked for 1-3 years at hospital answered that, they got headache when they were in working place, their heart rate increased progressively when they met patients. They also experienced like fatigue syndrome, such as lack of energy and tired. They stated that they placed under pressured, sometimes they felt guilty, hopeless when they were working. All this feeling may evoke because the inexperience nurse perceived that they lost confidence in caring patients. In addition, high demand nursing care from patients triggered this situation.

Moreover, in the teaching hospital like this hospital, nurses have other responsibilities to coach a nurse student. Some of them may feel stranger among the experience nurses. They have to adapt to new environment, new responsibility, new role, at the same time they have to handle with care anxiety patients and family.

The majority of studies were in favor in this situation. Duchscher[24] revealed that most of novice nurse experienced exhaustion at the first 18 months at working place. The novice nurses need to adapt the transition period from education to working environment. At this stage, new graduated nurse perceived all situation become complex, uncertainty, difficult and puzzlement. They will start to work professionally and become member of a teamwork. Team work in hospital consists of multi professions, the nurse requires professional integration. However most of inexperience nurse is lack of confidence working with other professional[25].

CONCLUSION

Statistically, there was a correlation between the length of nurse employment and work related stress on nurse at inpatient ward in the hospital. The shorter of the length of employment, the more stress on nurse. This fact showed that inexperienced nurse will get more stress than experienced nurse when they work in hospital. The result implies that self efficacy of graduated nurses and working environment are important to reduce their stress. Working in a good condition can improve patient safety.

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Potential Honey Propolis Trigona to Prevent Arthritis Rheumatoid by Increase Foxp3 Level; A Preliminary Study

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ABSTRACT

Background: Rheumatoid arthritis is an autoimmune disease and need the balancing of immune system. Foxp3 Treg level is one of critical regulator to balance system immune. This study aim to analyze potential of propolis and honey propolis for prevention rheumatoid arthritis based on Foxp3 Treg as a target. **Methods:** It was a quasi-experimental study with pretest-posttest control design, Subject divided into 3 groups, group 1 control did not give anything, group2 given propolis 60 mg/capsule and group 3 given honey propolis 35 mg/pack. Propolis and Honey Propolis Trigona was giving through 14 days and blood sample for ELISA examination taken three times, Before intervention (baseline), 7 day after intervention and 14 days after intervention. **Results:** Analysis mean difference between baseline data with 14 days data show giving honey propolis has the highest increase of Foxp3 Treg and giving propolis has the lowest increase of Foxp3 Treg. Among the three groups, only the group given honey propolis has a significant effect. **Conclusion:** Honey propolis has potential effect as therapy for prevention arthritis rheumatoid by increase Foxp3 Treg level. Adherence to consume honey propolis is necessary to provide the maximum effect.

Keywords: *Honey Propolis, Trigona, Arthritis Rheumatoid, Autoimmune*

INTRODUCTION

Rheumatoid arthritis (RA) is a severe inflammatory disease and categorized as one of autoimmune disease, unproper treatment will make it improve to joint damage and disability. The most disturbing is pain and swelling due to inflammation. In advanced conditions, the disease may increase the risk of cardiovascular disease and changes in bone metabolism. [1 2]

T regulatory (Treg) cell is critical regulator in autoimmune disease, impaired self-tolerance in autoimmune diseases such as rheumatoid arthritis occurs due to Treg cell failure to regulate its suppressive function. Reduction of Treg frequency correlate with increase of RA.

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Manipulating Tregulator cells with Foxp3 as transcription factor or marker of Treg as a target of prevention and therapeutic is a very important factor in immune homeostasis. [1 3-5]

Several studies has tried Treg injection to the the patient and successfully affect the duration of remission. [6 7] Several studies also use Salmonella bacteria that has been attenuated as a vaccine for cases autoimmune diseases, it has ability to induce Foxp3 Treg. Although successful in inducing the expression of Foxp3 Treg, using pathogenic bacteria is still being debated. [8 9] Tregulator cell involvement is the latest pathologic mechanism developed in the therapeutic target of rheumatoid arthritis, but it requires intervention to increase of Foxp3 Treg without debate and doubts about intervention safety.

South Sulawesi is one of honey and propolis producing regions and honey bee products include propolis and honey has ability to promote Foxp3 Treg both in healthy and unhealthy subject. This ability

associated with polyphenol, quercetin and vitamin content of its. [10-12] Studies of honey and propolis and its correlations with immune systems have been numerous, but studies that correlate honey and propolis with Foxp3 Treg are rare. The combination of honey and propolis is also rarely studied and usually researched distinctly.

This study aim to analyze potential of propolis and honey propolis for prevention rheumatoid arthritis based on Foxp3 Treg as a target.

MATERIAL AND METHOD

Material

Trigona honey and propolis used was local honey bee products, it was taken from Masamba, a district in South Sulawesi. Honey bee farmer has been produce in a large scale and become the raw material for some industries of honey and propolis.

The water content of honey is lowered dehumidifier up to 20% then stored for 3 days in a stainless container to precipitate the dirt. Propolis extracted using water and dried using fresh dryer as long as 24 hours. Honey propolis then mixed with 85% honey and 15% honey in 35 mg/pack. Propolis packed in capsule as much as 60 mg/capsule.

Methods

Protocol Recruitment of Subject

Ethical clearance has been accepted by Hasanuddin University Ethical Committee (1046/H4.8.4.5.31/ PP36-KOMETIK/2017). To recruit subject of study, we offering free rheumatic screening to those who have a rheumatic-like symptom. Thirty people were willing to take part and twenty of them were positive for rheumatic suspect (examination of ASTO, CRP and Rheumatoid Factor). They were giving information about protocol of study and asked to join the study, informed consent were giving both to them who had suspect of rheumatoid and normal subject.

Design and protocol of Study

It was a quasi experimental study with pretest post control design, Ethical Clearance from Ethical Committee of Medical faculty, Hasanuddin University). Subject divided into 3 groups, group 1 was control did not given anything, group2 given propolis 60 mg/ capsule and group 3 given honey propolis 35 mg/pack. Group 1 and 3 consist of 10 subject and group 2 consist of 7 subject, because 2 subject exclude after informed consent given because they had allergic with honey.

It was a quasi-experimental study with pretest-posttest control design, Subject divided into 3 groups, group 1 control did not give anything, group2 given propolis 60 mg/capsule and group 3 given honey propolis 35 mg/pack. Group 1 and 3 consist of 10 subject and group 2 consist of 7 subjects, because 2 subjects exclude after informed consent given because they had allergic to honey.

Propolis and Honey Propolis Trigona was giving through 14 days and blood sample for ELISA examination taken three times, Before intervention (baseline), 7 day after intervention and 14 days after intervention. Protocol of ELISA was use standard od human ELISA Kit produced by mybiosource.

Statistical Analysis

Data analyse using Statistical Package for Social Sciences (SPSS), statistical test were Wilcoxon and Paired-Sample T Test to compare of mean. Mean difference considered significant if probability value (p-value) less than 0.05.

RESULT

Analysis result after seven days giving honey propolis, it has the highest effect to increase Foxp3 Treg, and it is significant statistically while propolis and control also increase Foxp3 Treg but it is not significant (Table 1). After 14 days, data indicated a decline of foxp3 both group giving honey and honey propolis while control group shows an increase of Foxp3 Treg (Table 2).

Table 1. Comparison of Mean Difference Between Baseline with 7 days After Intervention

Groups	Level of Foxp3 (pg/ml)			P
	Mean±SD			
	Baseline	7 days	Mean Difference	
Control (n=10)	0.898±0.343	1.071±0.612	0.173	0.416*
Honey Propolis (n=10)	0.538±0.539	0.901±0.581	0.363	0.005**
Propolis (n=7)	0.417±0.581	0.425±0.110	0.008	0.917**

**Paired Sample T-Test*

***Wilcoxon*

Analysis mean difference between baseline data with 14 days data show giving honey propolis has the highest increase of Foxp3 Treg and giving propolis has the lowest increase of Foxp3 Treg. Among the three groups, only the group given honey propolis has a significant effect (table 3 and 4).

Table 2. Comparison of Mean Difference Between 7 days with 14 days After Intervention

Groups	Level of Foxp3 (pg/ml)			P
	Mean±SD			
	7 days	14 days	Mean Difference	
Control (n=10)	1.071±0.612	1.194±0.916	0.123	0.441**
Honey Propolis (n=10)	0.901±0.581	0.888±0.529	-0.013	0.897*
Propolis (n=7)	0.425±0.110	0.616±0.262	-0.191	0.172**

**Paired Sample T-Test*

***Wilcoxon*

Table 3. Comparison of Mean Difference Between Baseline with 14 days Afte Intervention

Groups	Level of Foxp3 (pg/ml)			P
	Mean±SD			
	Baseline	14 days	Mean Difference	
Control (n=10)	0.898±0.343	1.194±0.916	0.296	0.646*
Honey Propolis (n=10)	0.538±0.539	0.888±0.529	0.350	0.037*
Propolis (n=7)	0.417±0.581	0.616±0.262	0.199	0.173*

**Uji Wilcoxon*

Table 4. Comparison of Mean Difference Between Baseline with 7 days After Intervention

Groups	Mean Difference of Foxp3 (pg/ml)		
	Mean±SD		
	Baseline-7 days	7 days-14 days	Baseline-14 days
Control (n=10)	0.173	0.123	0.296
Honey Propolis (n=10)	0.363	-0.013	0.350
Propolis (n=7)	0.008	-0.191	0.199

**Paired Sample T-Test*

***Wilcoxon*

DISCUSSION

Intervention use honey propolis showed the significant increase of Foxp3 Treg compare to another group, both control and propolis intervention. Analysis in detail shows that increase of Foxp3 Treg happens in the first week and in the second week Foxp3 decline, we have an assumption that adherence of subject is determinant why the data is not consistent. In the first week, all subjects reported that they did not take their honey propolis and propolis regularly. Majority of subjects give a reason, they forget ones or too busy even we have remembered them. It shows that adherence is just consistent in the first week.

Propolis has the anti-inflammatory and immunosuppressant effect, the component of it that maybe has a role is Artepillin. Mechanism how propolis and honey bee products affect immunosuppressant still not clear and this study may be one explanation that Foxp3 Treg is the keyword of it. [13-15]

Prevention from arthritis was associated with increased of Foxp3 Treg ratio and decrease of inflammation such as IL-17. [16] Rheumatoid arthritis is a chronic systemic autoimmune disease characterized by synovitis and joint erosion and involves activation of T cells in its pathogenesis. [17] The abnormality that is encountered in rheumatoid arthritis due to the growth of synovial cells that damage bone and cartilage. The pathogenesis is the activation of autoreactive T cells that migrate into the synovial cavity and B cells, through a cytokine that is folded by T cells. The synovial membrane becomes hyperselular due to the accumulation large amounts of lymphocytes in various stages of activation, plasma cells and macrophages. All cells exhibit high activity and interactions between the cells that form the formation of immunoglobulin and rheumatoid factor. [18-20] Activation of excessive immune cells and the inability to recognize self-antigen is a determinant for arthritis rheumatoid an another autoimmune diseases, for this problem requires therapy that can lead to homeostasis of the immune system.

One of the main targets of therapy in rheumatoid arthritis patients is restore the immune balance system, regulatory T cells are the ideal targets in this case because their function can suppress inflammation. The better thing is that the increased amount of Treg to prevent inflammation will not inhibit the ability of the immune response to fight infection. [6 21 22]

Honey propolis has a potential effect to promote Foxp3 Treg in human suspect artritis rheumatoid. This study just an eliminary study and need more studies that controls more variables so it is clear that the effect of immune balance is derived from the intervention that is done.

CONCLUSION

Honey propolis has potential effect as therapy for prevention arthritis rheumatoid by increase Foxp3 Treg level. Adherence to consume honey propolis is necessary to provide the maximum effect.

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Ethical Clearance: from Faculty committee

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Conflict of Interest: Authors declare that there is no conflict interest related this study.

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Human Dimension Plays a Role in Realizing The Health of the Urban Dwelling, Jakarta, Indonesia

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ABSTRACT

Currently, in urban dwelling planning, the comfort and the health of the human living is set with parameters of the design standard. The human's dimension as the residents has not been considered to play actively in realizing the health of self and their residence. Meanwhile, the density and limitation of urban dwelling is an issue that causes the difficulty in designing the comfort and the health adequately. The purpose of this study was to reveal that the human dimension can play a role in the health of their home by identifying the indoor air quality. The method was quantitative and used Structural Equation Modelling (SEM). Human dimension in urban dwelling involved the dimension of residents and managers and was influenced by their knowledge. The residents' dimensions that assessed were the physical comfort, psychic comfort, potentially pollutant activity, and health participation. The result of this study indicates that the human dimension can contribute 19% in the realization of the residents' health via indoor air quality beside the design standard. The recommendation of this study is the need to include a human participation program in the policy of applicating the health in an urban dwelling.

***Keywords**: urban dwelling, human dimension, indoor air quality, health participation*

INTRODUCTION

Previous studies on the measurement of building quality and the environment tend to assess buildings and their environment with certain parameters professionally recognized. These studies have not place the role of humans as a factor that can be an asessment tool in influencing the value of the measurement of the buildings and the environment.[12] Unfortunately, such studies revealed that all interested human and being part of apartment operations are not already intended to optimize their healthier dwelling.[34] Residents and managers without good awareness tend to reduce the quality of building and its environment atmosphere that affect human health. Preliminary investigation proved that educated residents and managers still carry out actions which cause negatively the indoor health quality such as smoking, using chemical finishing materials, do not clean the room, and do not even care about things that can damage the health of neighboring units. Thus, a study that explores the role of the human dimension in this focus of residents and managers to maintain the health in building through air quality becomes important.

The novelty of this study is the health in an urban dwelling can be optimized with the unity of the human dimension: the residents and managers through the right knowledge, behavior, and participation. The healthy urban dwelling is not only determined by luxury finishing, the reliability of occupancy, ventilation system and outdoor air quality but is also influenced by the unity of knowledge, behavior, and participation of the residents and managers as the social capital in an urban dwelling.

Jakarta has developed into a megapolitan city where many economic interests are intertwined with the surrounding cities. Therefore, Jakarta as big-city influences the lifestyle of their inhabitants and the workers particularly who work in this urban area interested live in vertical housing. Vice versa, sometimes, they still carry on negative behaviors from their origin when they live in an urban dwelling densely. They did not realize that living in an urban dwelling there are some disciplines in order

living sustainably. Meanwhile, the hazardous of IAQ was potentially caused by 4 things, that are contaminated outside air penetration, indoor human activity that carried out combustion activities (like cooking and smoking), inappropriate waste management, cleaning with chemical liquid, and building finishing materials which contains certain chemicals.[5] The operations in building through the maintenance activities need to be supported by a social-cultural system.[4] The supporting data shows that the prevalence of respiratory disorders in urban vertical dwellings in Jakarta was 42.4% while the Basic Health Research[6] on the prevalence of ARI (Acute Respiratory Infection) in Jakarta was 22.6%.[7] This shows that apartment residents are more likely to be infected with ARI double greater than the general occupancy in Jakarta.

The factor of the human dimension that care on the good ventilation condition is social capital that is important in realizing healthy air quality indoor in the urban vertical housing.[8] Researchers looked at the factors of knowledge, behavior, and participation based on the fulfillment of the physical and psychological aspects of occupants by managers will affect the sustainability of urban dwellings. If the role of the human dimension of the occupants and managers can be improved through the right perception, behavior, and participation, then the healthy and sustainable urban dwelling can be realized.[9] Maslow[10] uses the fulfillment of physiological terms, security, ownership and love, self-esteem, self-actualization, and self-transcendence to describe patterns that motivate people to move. Thus, the interests of the fulfillment of the physical and psychological comfort of residents can be predicted as a factor that influences health in addition to directed activities and participation to realize shared health. In addition, the manager's capacity will certainly influence his ability to encourage residents. In Indonesian Government Regulation 1988 number 4 on Flat Housing,[11] it is stated that there are 3 manager capacities, they are the ability to manage, ability to inspect, and ability to serve. In this study, the author added a capacity manager, it is the ability to motivate according to Maslow's theory.

MATERIAL AND METHOD

The data were taken on the middle-income apartment located in central Jakarta. the total area of the apartment is 2.9 ha, located on the main road of Ahmad Yani Road with the density of the vehicle is quite dense. The road consists of 8 lines and freeways (4 lines) and vehicle speeds between 60-120 km/hour, so it is quite noisy and the hazardous level of air pollution.

Most of the participants have lived in this apartment for 2-4 years. Most of the residents' participants live in 2 towers of the 6 towers that have been built, namely the blue and yellow towers. The youngest participant is 16 years old while the oldest is 60 years old. Participants occupy almost evenly at the levels of apartment towers. A unit of participants is occupied by 1 to 4 people but most of them are occupied by 2 people. Unit area is 33m^2, consisting of 2 bedrooms, 1 living room, 1 bathroom and 1 balcony. The balcony is very narrow, it can only be put for cleaning equipment and AC machine. Manager participants are from related divisions to IAQ services: maintenance staff, garbage attendant, technician, customer service, and human resource development. Manager participants are between the ages of 23 to 50 years and on average have worked between 2 and 6 years in this company. The total number of participants is 176 people, 88 residents, and 88 managers. Data collection is mostly carried out from June to August 2017 but the measurement of biological pollutant data was taken in February 2018.

This study used a quantitative method. For collecting participants data was used a questionnaire. The residents' questionnaire consists of 4 part which are the physical comfort, psychological comfort, potentially pollutant activity, and health participation. The managers' questionnaires consist of 4 parts, which are the ability to serve, ability to inspect, ability to manage, and the ability to motivate. The IAQ data consists of the measurement of physical pollutants, chemical pollutants, and biological pollutants by IAQmeter. The questionnaires and the measurements use a Likert scale (1-5). The physical pollutants were temperature, humidity, and particulate meters. The chemical pollutants consisted of carbon monoxide, carbon dioxide, and formaldehyde. Furthermore, for biological pollutants, only bacterial data was taken. The parameter for determining the scale range of pollutant measurement was used regulation of the ministry of health of the Republic of Indonesia, number 1077.[12]

The participants data were as the dependent variable and the measurements data were as the independent variable. There was a suppressor variable which strengthened the influence of the variable dependent to

the independent variables that were the residents' knowledge and managers' knowledge. The knowledge consisted of the education level, the knowledge of the pollutants impact, and the knowledge of hygiene. All data were processed using the SmartPLS 3.2 with a reflective order formation.

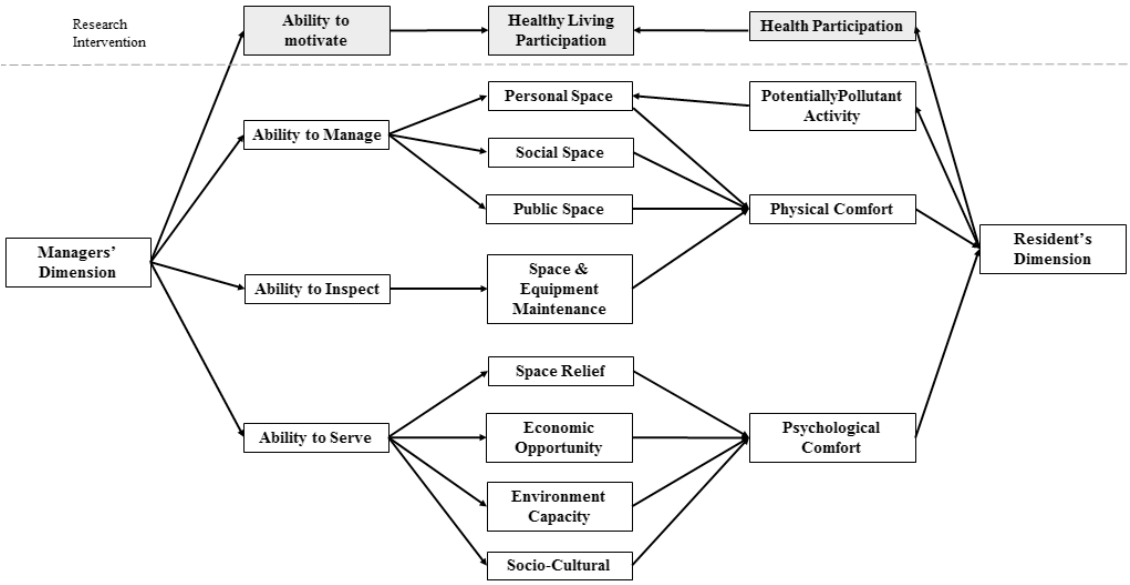

Figure 1 . The construct of SEM: the human dimensions of the Residents-Managers

Figure 1 shows how to meet the interests and responsibilities of residents and managers. From the residents' dimensions, the physical comfort relates to personal space, social space, public space, and equipment maintenance. It meets to manager's dimensions, which are an ability to manage and ability to inspect. The psychological comfort relates to space relief, economic opportunity, environmental capacity, and socio-cultural and meets the manager ability to serve. Apart from this, for this research intervention, added one variable indicator related resident and manager participation, those are the health participation and the ability to motivate.

FINDINGS

The observation and IAQ measurement show that the unit condition was influenced by the resident behavior such as determining the finishing material, doing hygiene lifestyle, and checking AC regularly. The unit which is finished with the wallpaper showed the higher formaldehyde which prevalency causes respiratory symptoms.[5] Although the measurement results do not exceed than the parameter limit, this could be a warning that this common wallpaper is not good for children health ,[13] moreover in the new apartment.[14] The daily materials which particularly annoying smell was revealed: cigarette smoke, strong odor food which thrown to sink, and chemical air fragrance. The strong odor food that thrown away to the sink, can be smelled by the others unit via the plumbing pipes, which caused an unpleasant smell or the neighbors. The residents who choose a good quality and care the maintenance of AC, do the indoor air condition feel fresher. The unit with good quality AC has the humidity and temperature and meet the parameters. Then, a unit which is inhabited by people who diligently clean their room, has a low bacterial number and determinate to ventilate the spaces.[15]

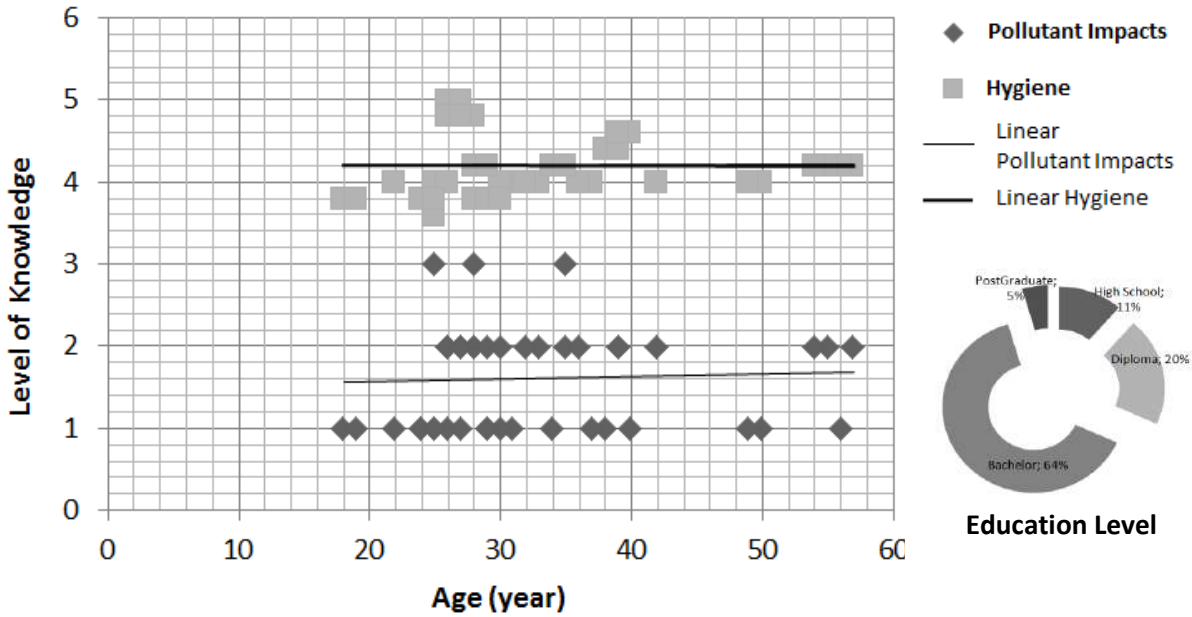

Figure 2. The characteristic of the residents' participants: Age, Level of knowledge consists of pollutant impacts and hygiene, and Education Level.

Figure 2 shows that most residents' participants are the young age 18-40 years old. The young age even single and spouse enjoy new life experiences, living in an urban dwelling as a trend lifestyle in Jakarta. Related the experience, young adults choose to live in a metropolis with mixed-use facilities and ease of transportation in one place.[16 17] It is moreover for creative and good education workers.[18] The education level shows that most residents graduated bachelor, a good education level. According to PERMENDIKTI number 44/2015[19] in Indonesia, diploma and bachelor graduates are categorized as a level who able to work as executors and analysts and have the critical knowledge to solve the problem. This figure also shows that almost all of the resident state they know the hygiene and the elder age has more this knowledge than the younger. However, they confess do not have enough knowledge of pollutant impacts. Almost half of the residents have lived for 2 years and the rest have been more than that. It shows that the residents still in the adjustment period living in an apartment and newly married couples. At this stage, learning to live independently far from parents and need the presence of people nearby can help to provide the instrument and emotional support.[20] This means they need to do social support for fulfilling comfort living.

According to the theory of human dimension in architecture perspective, there is two dimension of human which fully needed that are physical and psychological comfort on indoor.[21] Figure 3 shows the residents' physical comfort and residents' psychological comfort. For the physical comfort, the residents stated the furniture size quite decent. Figure 3 reveals that most residents feel the private room is already comfortable. It means the private room is relieved enough to do their private activities. However, half less of them do not feel comfortable for the family activity. It is concluded that the residents agree that the unit room good for a couple but not good enough for a family. Further, most of them feel comfortable in the neighboring space. It means the residents are satisfied with the public space around the building.

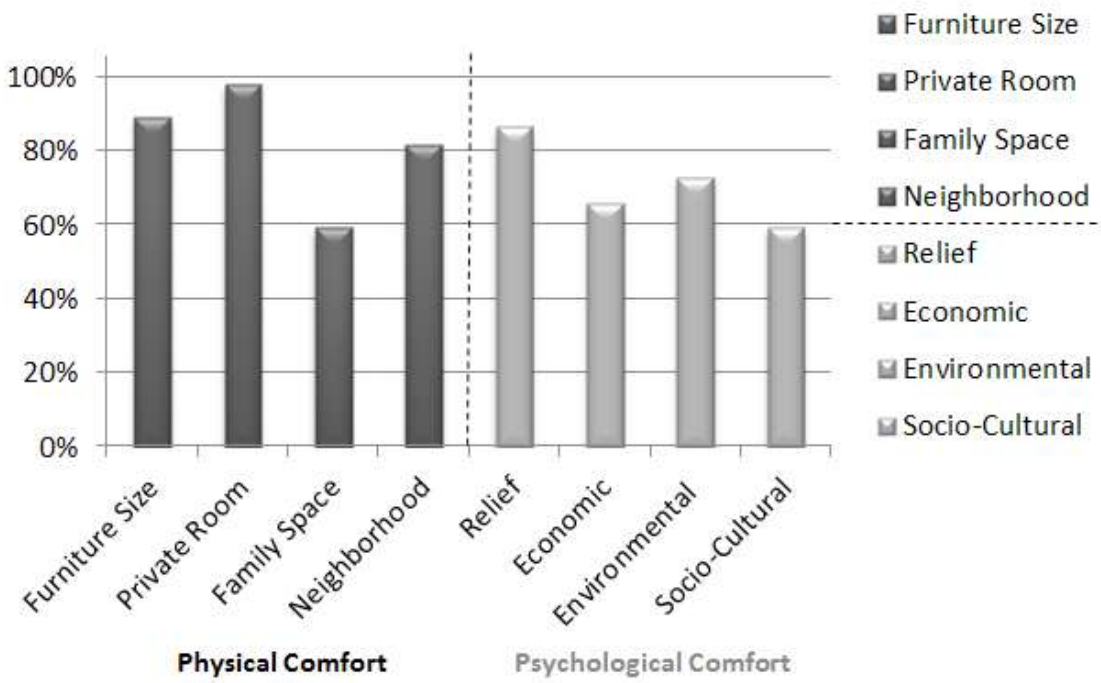

Figure 3. The physical and psychological comforts of the Residents

Further, Figure 3 shows the resident psychological on relieved space, economic opportunity, environmental capacity, and socio-cultural program. Most residents feel that the rooms in this dwelling are relieved, especially for the couple. It means that they feel appropriate on the wide of spaces. The residents state that the economic opportunity in this apartment is less good related to the cost of living, savings, and money-making opportunities in this area. On environmental capacity, most residents feel its support for their activities. Then, for the socio-cultural program, a half residents state that less program for it. In fact, there were some like joint gymnastics and worship together on Muslim holidays but those are the rare event. The improvements in quality of life and life satisfaction while health assessment and education programs encourage positive health behaviors.[22]

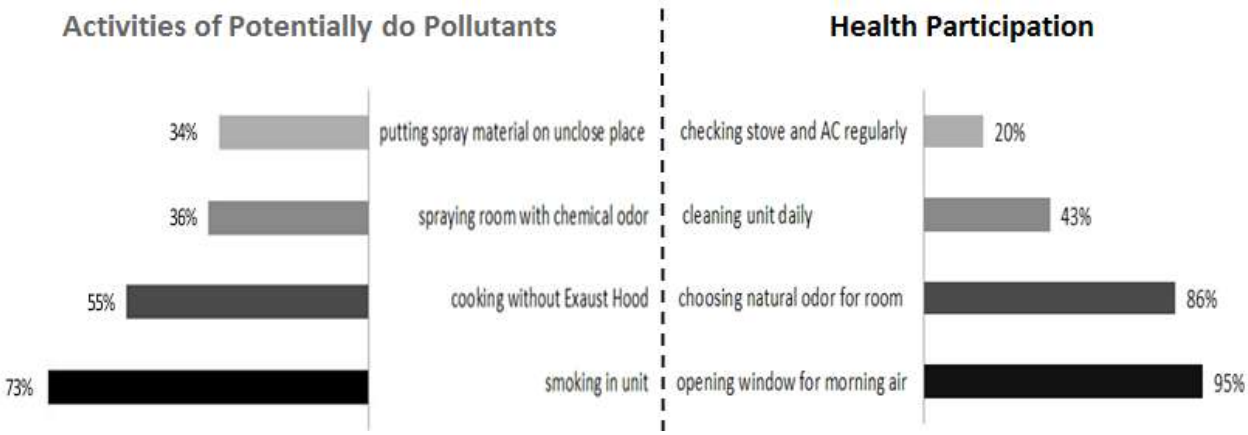

Figure 4. The activities of potentially do poll utants and health participation that influence IAQ in unit

Based on the result above, then the following discussion on its relation to their behavior which is revealed in Figure 4. Figure 4 shows the residents' activities which potentially do pollutants such as putting spray material on unclose place, spraying chemical fragrance, smoking, and cooking in large quantities. Unit room needs to be circulated in order the chemicals are sucked out through exhaust fan and AC. The ventilation can accelerate pollutant trapping due to temperature inversion.[23] The opposite, the health participation show the residents' behavior which affects positively to IAQ such as choosing natural odor for the room, opening window for fresh air, checking the stove and AC periodically, and cleaning the rooms of dust and mold. These reveal that human dimension can play the role in realizing health air in the apartment.

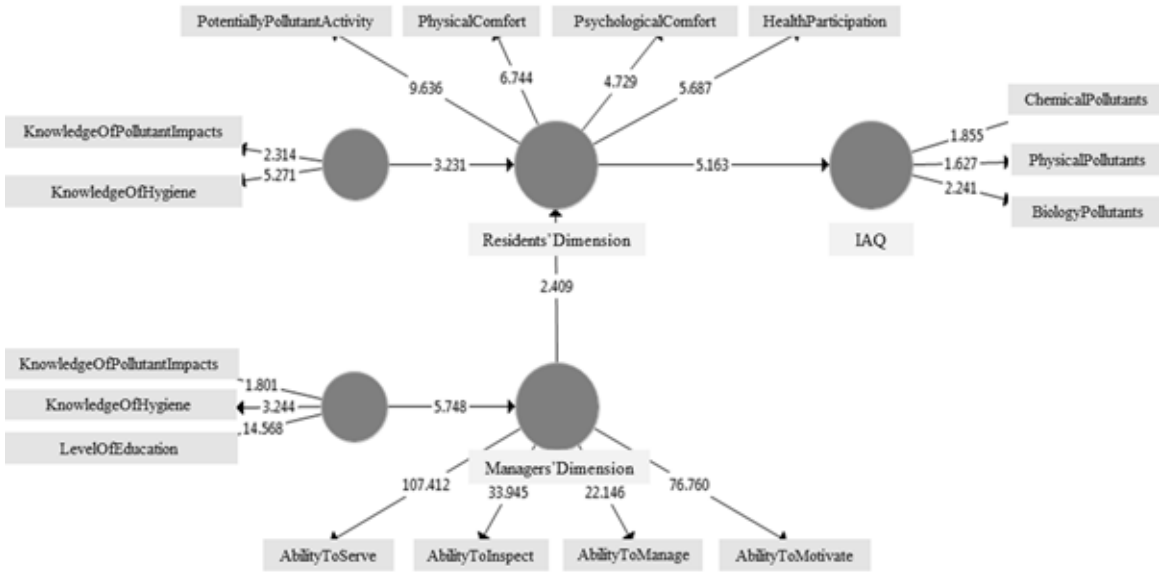

Figure 5. The human dimensions' construct in SmartPLS and the relationship values

The following discussion is on the influence of human dimension construct to IAQ. Figure 5 is a construct of the influence of the human dimension to IAQ using SmartPLS analysis. The results of the calculation of the SmartPLS, produce certain relationship values between them. However, the education level of the resident does not support this construct, its value attenuates. It reveals that awareness to participate not depends on the education level of the resident, but needs the knowledge of hygiene and pollutant impacts. Figure 5 shows all values of the outer model of all latent variables meet the requirements with >0.4 with Residents' Knowledge and Managers' Capability as suppressor variables. The capability of managers determines the improvement of residents' behavior.[24 25] The relationship between services provided by private companies (managers) and residents' satisfaction are firm, which is supported by hygienic conditions as a major role.[26] Apart from that reason, the inner model value between latent variables becomes strong (5,163) and meets the reliability requirements >1.96. This means that this SEM construct is right for this research study and confirms the human dimension can influence IAQ in urban dwelling in Jakarta, Indonesia.

To assess the value of the influence among the latent variables, it can be seen through R Square Adjusted in percentage. This analysis result shows the influence of all variable latent as the dependent variable: Residents ' Knowledge, Managers' Dimension, Managers 'Capacity, and Residents' Dimension to IAQ that is 19%. This percentage shows that the Residents' Dimension and Managers' Dimension as a human dimension influencing IAQ condition as 19%. In the theory of architecture and building equipment,[27] IAQ is generally influenced by the condition of air ventilation, air quality outside the building and indoor spaciousness. The result of this study indicates that the human dimension through perception, behavior, and participation can influence IAQ by 19% beside the influence of air ventilation condition, air quality outside the building and indoor spaciousness.

CONCLUSION

An effective human dimension is the manager's dimension as a driver of the resident's dimension which then influences IAQ. The managers' capacity which consists of the level of education, knowledge of the impact of pollutants and hygiene knowledge is very significant in positively encouraging the resident's dimension to IAQ. Thus it can be said that an effective human dimension for realizing the health in urban dwelling in Jakarta is by increasing management capacity that can encourage residents to behave healthily. Although this construct is only 19% as part of all variables which influence IAQ in an urban dwelling, it is a social capital can optimize the health in the unit the hidden place avoid from city hazardous pollution.

It is important to include a human participation program in the government policy of applicating air quality in an urban dwelling. The residents' role is important in determining their own unit comfort and health and their neighbors. Then, to realize the role of the human dimension fully potential, the next study should include the other human role such as planners, policymakers, implementers.

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Maternal Education Level and Parental Income Toward Stunting to Students of Salulayang Elementary School in Mamuju Regency

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ABSTRACT

Stunting is a major public health problem in most developing countries and part of the risk factors toward the high incidence of diseases both directly and indirectly. In Indonesia, stunting is a national problem with the percentage of incidence above the tolerance limit set by the World Health Organization (WHO) which is ≤ 20% (WHO, 2010). The results of Basic Health Research (2013) stated that stunting in children under five in Indonesia in 2010 amounted to 41.6% increased to 47.9% in 2013 and for Mamuju Regency in West Sulawesi the percentage of stunting was 47.26%. There are several factors that influence the incidence of stunting, including maternal education and parental income. The level of maternal education and low parental income will result in family limitations in providing nutritional needs both in quality and quantity. The purpose of this study was to determine the relationship between the level of maternal education and parental income with the incidence of stunting. This study was a cross sectional study conducted at SDN Salulayang Mamuju District with a sample of all 90 students. Variables were measuring through direct interviews and questionnaires methods. The results showed that the variables of maternal education levels were significantly associated with the incidence of stunting (p = 0.005), as well as parental income significantly associated with the incidence of stunting (p = 0.006). It is necessary to increase knowledge about nutrition, especially about stunting with the aim of prevention and the need for economic improvement through community empowerment so that there is no stunting problem caused by poverty.

Keywords: *Stunting, Level of Education, parental income*

INTRODUCTION

Stunting is one of the major health problems in Indonesia, especially in West Sulawesi. Stunting (extremely short) is a form of malnutrition characterized by height according to age based on WHO standard. According to WHO Child Growth Standard, stunting is based on body length index compared to age (BL / A) or height compared to age (H / A) with a limit (z-score) of less than -2 SD[1].

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Stunting prevalence in Indonesia is 37.2% and in West Sulawesi especially Mamuju Regency is 47.26% (Riskedas, 2013). According to the results of the South East Asia Nutrition's Surveys (SEANUTS in the Ministry of Health, 2014) about 24.1% of boys and 24.3% of girls in Indonesia experienced short body size (stunting). A survey of more than 7,000 elementary school children in Indonesia aged 6-12 years shows that around 1 of 3 children in Indonesia experience height growth problems. If it compared with countries in ASEAN such as Vietnam, Malaysia, and Thailand, Indonesia had a greater number of children with short body sizes[2,3.]

Childhood is a kind of period that is very sensitive to the environment so that specific handling is needed, especially nutritional intake. Stunting as one of the nutritional problems can inhibit the development of

children which can affect the next period of life such as susceptibility to disease, intellectual decline, decreased productivity, babies born with LBW conditions (Low Birth Weight) to cause poverty. Therefore the role of the mother is needed in supporting efforts to overcome the stunting problem.

One of the main causes of stunting is socioeconomic status, including maternal education level and parental income. The results of Basic Health Research [4] show that the incidence of stunting in children under five is influenced by low income and low parental education. Families with high parental income will allow the family to obtain optimal nutritional intake both in terms of quality and strength to produce better health. Low parental income is considered to have a significant impact on the possibility of children being thin and short[3].

A high level of maternal education will be easier to access information, especially about nutrition and health compared to mothers with lower levels of education. This is consistent with the Salimar study which states that a higher level of maternal education (above high school) will have 1.405 times of chance to get children with normal nutritional status compared to mothers with low education. it was found from the study that to predict the occurrence of stunting maternal education can be used as a change factor[5].

MATERIALS AND METHOD

Types of research

This research uses a survey design with a cross sectional study approach. This study determines the relationship between independent variables (maternal education level and parental income) with the dependent variable (Stunting incidence) in the same observation period. The relationship testis using the Chi Square test. If the Chi Square test is not eligible, the relationship analysis uses the Fisher Exact test.

Research sites

This research took place at Salulayang Elementary School in Mamuju Regency. It was chosen as the research locationdue to school is in the native settlement of Mamuju Regency and it is located outside the urban area so automatically the students in the school are also native inhabitants of Mamuju Regency. This is different from elementary schools in urban areas where students are from outside Mamuju Regency.

Population and Sample(s)

The population in this study was taken using total sampling technique. The samples in this study were students in grades 1 - 5 with a total of 90 students. At the time of the research, the 6th grade students had graduated because they had gone through the national examination process.

Research Instruments

The variables in this study were measured through direct interviews using a questionnaire. The questionnaire contains questions about the level of maternal education and income of parents. While the *stunting* indicator is carried out through anthropometric measurements to students through height measurement using a microtoice. The height measurement results are thencompared to the age of the student then using WHO NCHS references to assess the incidence of student stunting.

RESULTS AND DISCUSSION

Research on the relationship between maternal education level and parental income with the incidence of stunting was carried out at Salulayang Elementary School, Mamuju Regency, located in Bambu Village, Mamuju District. The samples in this study were selected by using total sampling technique in 90 students. The research that has been carried out starts with direct interviews with students of Salulayang Elementary School in Mamuju Regency. The interview was conducted using a questionnaire containing questions about research variables. Then the next step is to measure height to assess nutritional status (stunting) for all students of Salulayang Elementary School in Mamuju Regency. The results of this study can be seen in table 1 below:

Table 1. Distribution of Respondents Based on maternal Education Levels And Parental Income with Stuntingincidents

characteristics	Stunting				Total		P[a]
	Stunting		Non-Stunting				
	n	%	n	%	n	%	
Maternal education							
low	36	49,3	37	50,7	73	100	0,005*
high	2	11,8	15	88,2	17	100	
Parental income							
<RMW							
≥ RMW	37	48,0	40	52,0	77	100	0,006*
	1	7,7	12	92,3	13	100	

[a] Chi Square * p <0.05

Based on table 1 shows that the incidence of stunting in Salulayang Elementary School students in Mamuju District as many as 38 children (42.2%) and those without stunting were 52 children (47.8%). The occurrence of *stunting* in students of Salulayang Elementary School in Mamuju Regency has a difference that is not too far from students who do not experience stunting. Children who grow short have a 27 times risk for stayingshort before entering puberty and conversely children who grow normally at an early age can experience *growth faltering* and have a 14 times risk of short growth in pre-puberty age[2]. *Stunting* is an illustrate of malnutrition that occurs over a relatively long period of time. The *stunting* indicator used in this study is that the Height/ Age index illustrates the nutritional status of children in the past so that the effect on malnutrition will eventually affect the child's height.

The level of maternal education based on table 1 shows that for distribution of low maternal education level (<Senior high school) as many as 73 students (81.1%) while the high level of maternal education (≥Senior high school) as many as 17 students (18.9%). For further analysis in this study shows that the relationship between the level of maternal education with the incidence of stunting in students of Salulayang Elementary school in Mamuju Regency shows a significant relationship. It shows that mothers who are highly educated will give birth to a healthy generation so that they would avoid health problems, especially stunting.

Contrary on mothers with low education will have the opportunity to give birth to children with stunting conditions. This study is in line with research in Cambodia by Ikeda, et al[6] and Tiwari, et al[7] in Nepal that maternal education is a risk factor for the incidence of stunting in children under five years.

The level of maternal education will determine the level of understanding of the knowledge of nutrition obtained. The ability to have a broader knowledge of child care practices and ability to maintain. Families who are educated will live in small households, in more decent homes, can use health services that are better and more adept at maintaining a clean environment[8]. Parental income distribution shows that the incidence of stunting is more common in families with income below the Regional Minimum Wage (RMW), as many as 37 people (48%) and those who did not experience stunting with family income above the RMW as many as 12 people (92.3%). The results of statistical analysis shows the value of p <0.05 (p = 0.006) so that there is a relationship between parental income and the incidence of stunting in children of Salulayang Elementary School. The results of this study indicate that the higher income of parents will affect the health status of children, especially the incidence of *stunting*. low income will have an impact on expenditure for nutritious food. This research is in line with research conducted by Nadyah et al.[9] in the provinces of Bali, West Java and NTT that there is a significant relationship between family income with stunting in children. Based on these studies, it was explained that economic status has more influence on linear growth than growth in body weight[10]. Families with high income will be able to manage a better family diet. Families will choose food ingredients in good quality and quantity to improve family health status

especially in children. Nutritious and balanced foods do not have to come from expensive foodstuffs but it can be realized through a balanced diet by prioritizing simplicity and not deviating from the general guidelines of balanced nutrition[11-14].

CONCLUSION

The results of this study indicate that there is a relationship between the level of maternal education and parental income with the incidence of stunting. Efforts are needed to improve maternal education and knowledge about nutrition, especially stunting problems so that the role of mothers in household management, especially child care and provision of food ingredients, is better and in accordance with nutritional guidelines. Then it is necessary to improve the economic status of the community through economic value productivity so that *stunting* problems no longer occur from poor families.

Conflict of Interest : None

Ethical Clearance : obtained from Health Polytechnic of Health Ministry of Mamuju

Source of Funding: Research which was sourced from DIPA the Health Polytechnic of Health Ministry of Mamuju

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Analysis of Educational Factors, Interest and Motivation Towards the Behavior of Early Detection of Cancer Cerviks in Women of Fertile Age in the Upt Health Center Kembangbahu Lamongan

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ABSTRACT

The purpose of the study to find out the influence of factors of education, interest and motivation towards the behavior of early detection of ca cervix in the women of childbearing age in the health Kembangbahu Lamongan design research using observational analytic with cross design sectional. The entire population is women of childbearing age was 9476 in UPT Kembangbahu Lamongan with 369 samples of respondents taken with engineering proportional cluster random sampling. Data analyzed with logistic regression test. There are educational factors influence behavior towards early detection of ca cervix in the women of childbearing age (p-value 0.000), there is interest in behavioral factors influence early detection of ca cervix in the women of childbearing age (p-value 0.000), there is the influence of motivation factors against the behavior of early detection of ca cervix in the women of childbearing age (p-value 0.05) and there the influence factors of education, interest and motivation towards the behavior of early detection of ca cervix in the women of childbearing age (p-value 0.000). to make the behavior is indeed needed a variety of factors as predisposing factors include education, interest, and motivation. It was concluded that educational factors, interest, and motivation being the dominant factor against the behavior of early detection of ca cervix in women of fertile age. It is recommended that place research improve outreach regarding early detection of ca cervix in the women of childbearing age.

***Keywords**: Educational, Interests, Motivation, Behavior, Early Detection, Cervical cancer*

INTRODUCTION

In Indonesia based on basic health Research data the year 2013 figures recorded the incident Ca cerviks on women as much as 522,354 sufferers[1]. In East Java, basic health Research data based on the year of 2013 recorded the numbers of Genesis Ca cerviks on women as much as 1.6/100%1. Given the impact that there is that it should be done to avoid the Ca cervix. The first is ever having sexual intercourse, then having to do early detection of Caucasian with Pap smear tests regularly every two years until the age of 70 years. Abnormal symptoms such as bleeding, especially after coitus (intercourse). The third thing is don't smoke. Other methods besides pap smear are by visual inspection with acetic acid. Current cervical cancer can also be prevented by administering the HPV vaccine. This step can cause genital warts and cervical Ca[2-5].

The problem is that there are still many fertile women does not implement early detection of Ca cervix. Many of the factors that are led to the lack of implementation of early detection. According to Green[6,7], someone wants to do things like early detection of the cervix, he or she will know if the purpose and merits. After know will determine attitudes i.e. agree or disagree with that program. After that also depends on perception, values, belief. So, will depend on enabling factors such as the presence of affordable health facilities for early detection, the presence of social support and so on. Maslow's motivation theory says that people will be compelled to act based on need, as well as desire or

interest or motivation. A powerful motivation or impulse must be related to sufferers through various approaches. The hope will soon arise interest to implement early detection of Ca cervix.

MATERIALS AND METHOD

Analytic observational research design with cross-sectional approach i. The population is the whole fertile age of women who are on the Clinic Kembangbahu Lamongan as much as 9,479 women of childbearing age, the number of respondents as many as 369 respondents use proportional cluster random sampling. Education data collection, interests, motivation to use the questionnaire and conduct early detection of the cervix using observations that are given to women who are in the Clinic Kembangbahu, Lamongan. then analyzed by Logistic Regression.

RESULTS

Tabel 1. Result of Logistic Regression

Variables	B	SIg	95% C.I.for EXP(B)	
			Lower	Upper
Education	4.430	.000	21.207	332.234
Interest	1.877	.000	3.363	12.687
Motivation	-1.225	.040	.091	.944
Constant	-7.268	.000		

The results of the logistic regression test Education Factor Influences, interests and motivation towards the behavior of early detection of Ca Cerviks in women of fertile Age in the health Kembangbahu Lamongan April 12 until May 12, 2017

DISCUSSIONS

1. Implementation Of Education Ca Cervix

Almost half of the respondent's cervix ca education implementation in women of fertile Age categories include less. This is due to the implementation of this required cervix ca educational facilities and infrastructure including the existence of a program for this activity. Facilities and infrastructure in question is of the required learning media such as books, magazines, newspapers or even internet public awareness by health workers. This means it is not necessarily for everyone have it. This includes the already popular is the internet, not all people use the android handphone that can be used to access the internet to read ca cervix are common among women of fertile Age.

In addition to the above factors is also related to the status of gravida from respondents. Based on the results of the analysis of the obtained most of the respondents were multigravida with educational categories include less. This is because in general people were less concerned with preventive action regarding the disease. Including less care about the troubles of ca cervix. Therefore despite already belongs to multigravida, besides being still about ca cervix is still lacking.

2. Interest in the early detection of Ca Cervix

Based on result above known to almost half of the respondents including the high interest has to implement early detection of ca cervix IE as much as 163 respondents (44.2%) of a total of 369 respondents.

The results of the research supported by the existence of previous research results conducted[8,9] claims based on a test of paired t-test is known to result in the amount of 0.005 0.000 significantly and this means there are influences counseling about cancer of the cervix against interest do the pap smear. Changes between the pre-test post-test with IE the number of 29 respondents. Experience increased interest in better, thus it can be concluded that the granting of an extension of cervical cancer by the method of buzz group have the influence of maternal interest significantly to do pap smears. With the extension of the mother's interest in doing a pap smear examination be increased, because at the time the extension this is going on the transfer of knowledge and insight about cervical cancer so that increases interest in the early detection of ca by cervix Pap smear or IVA

3. Motivation towards early detection of Ca Cervix

Based on result above is known to almost half of the respondents included have low motivation to implement early detection of ca cervix IE as much as 149 respondents (40.4%) of a total of 369 respondents.

The results of this research are consistent with previous research by which stated there is influence significant (OR = 4.700; 95% CI 1.379 hingga16,016; p = 0.013) with mother motivation behavior between checks IVA. Thus the motivation can give directions

and activities that should be carried out in accordance with the outline of the objectives planned previously and selection of works, i.e. determining what works to do matching to achieve the goal, by opting out of the works that are not useful for the purpose. A selection of works that are already defined or worked on will give you the confidence that high because it is already in the process of selection.

The results showed almost half of the respondents included have low motivation to implement early detection of ca cervix. This is due to the onset of high motivation indeed must be supported by the presence of a very strong feeling of need to implement early detection of ca cervix.

4. The behavior of early detection of Cancer Cervix with Pap smear Test

Other factors that also supports the majority of the respondents including implement early detection of ca cervix with the pap smear is the age, education, occupation, status of gravida or information. In terms of age factor known to most respondents aged 35 years old with behavior > pap smear categories include Yes (do). This is due to the age that the older people are increasingly aware of the health risks. Included with age 35 years > for women are also increasingly at risk of experiencing ca cervix. Therefore in this age group most widely implement early detection of ca cervix.

Factors that affect behavior are also visible in the early detection of ca cervix is the status of gravida. The assumption is with the higher the gravida, the more so the more positive experience to early detection of ca cervix. Based on the results of the analysis of the obtained most primigravida pap smear behavior including did. This is because with his status primigravida which means the number of children 1 child, causing concern for the better so there is encouragement implement detection of ca cervix. Haliniyang behavior accomplishing the cause to implement early detection of ca cervix.

5. Influence factors of Education against the behavior of early detection of Ca Cerviks

Based on result above revealed the influence of the educational factor against the behavior of early detection of ca cervix in women of fertile age in the health Kembangbahu Lamongan (p-value 0.000).

The results of this research are consistent with previous research[9-12] stating that the most dominant factor influencing the behavior of the early detection of cervical cancer is educational intervention methods wish and drive with a value of p = 0,010 and OR 3.050. This is due to the method of education wish and drive became the deciding factor because it is a health education given to the respondents to pay attention to the background of the client and his needs, education is providing a form of learning with a variety of lectures covering the stimulus using LCD, CD playback, sharing, peer discussion booklets, demonstration examination pap smear and counseling involving the family as supporters.

6. Influence factors of interest in the behavior of early detection of Ca Cervix

Based on result above revealed the influence of the factor of interest in the behavior of early detection of ca cervix in women of fertile age in the health Kembangbahu Lamongan (p-value 0.000).

Interest as a tendency or desire a high against something. Interest makes a person try and apply yourself to it and eventually gained a deeper knowledge of explains that the interest is the consciousness of a person against an object, person, problem, or situation related to her. This means that the interest should be viewed as something that is conscious. Therefore interest is the psychological aspects of a person to pay attention to high specific activity against and encourage those concerned to carry out such activities. In terms of the principal elements of interest is the concern, the thrust of each individual and pleasure. The influence of positive interest will make someone they are interested to experiment like to feel pleasure, joy, and joy. Pintrich and Schunk also mentioned that interest is an important aspect of the motivations that influence attention, learning, thinking and achievement[13].

7. Influence factors of Motivation against the behavior of early detection of Ca Cervix

Based on result above in mind there is a motivation factors influence behavior towards early detection of ca cervix in women of fertile age in the health Kembangbahu Lamongan (p-value 0.05).

The results of the analysis showed the p-value of 0.004, which means that the value of the consistency of the results of this research are 4/1000 or have an

inconsistent or there's an error four times if the research is repeated as many as 1000 times. This shows a very high trust value about the influence factors of motivation against the behavior of early detection of ca cervix in women of fertile age. Means that the results of this study provide information very credible because of the significant requirements of no more than 0.05 or there's an error 5 among 100 repetitions.

8. Influence factors of Education, interest, and Motivation towards the behavior of early detection of Ca Cervix

Based on result above revealed the influence of factors of education, interest and motivation towards the behavior of early detection of ca cervix in women of fertile age in the health Kembangbahu Lamongan (p-value 0.05).

Many of the factors that led to the lack of implementation of early detection. The study of an aspect of behavior according to Green (Notoatmodjo, 2010) someone wants to do something such as early detection of ca cervix will know if the purpose and merits. After know will determine attitudes i.e. agree or disagree with that program. After that also depends on perception, values, belief.

There are educational factors influence, interest, and motivation towards the behavior of early detection of ca cervix in women of fertile age due to behavior accomplishing indeed needed a variety of factors as predisposing (predecessor) behavior accomplishing. Many experts conduct that has already suggested this, good Green, Snehendu B Kar, the WHO or the others have suggested this. Without knowing the intent and purpose of the preventive action that so then people would never think about early detection of cervical cancer. After people already know the advantages of implementing the early detection of cervical cancer then people will want to carry it out.

CONCLUSION

Based on the research results analysis, there are educational influence, interest and motivation towards the behaviour of early detection of ca cervix in women of fertile age in the UPT Clinic Kembangbahu Lamongan. so the dominant variables can be inferred is the educational value of the regression variables 4.430 with p value 0.000 < 0.05 then Ho denied. Midwife or health worker is expected to further enhance training, mentoring, and the granting of health information especially about ca cervix thoroughly in order to make the public understand and are aware of the importance of detecting early ca cervix and willing to participate in a program of early detection of ca cervix.

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Ineffective Regulation of Narcotics Crime Prevention (Criminology Perspective)

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ABSTRACT

The reality is that it should be a reason for us to worry because it threatens the future of the young generation who are the holders and successors of the nation's relay. That said because the impact caused by drugs is so tragic. The impact of drugs includes physical, psychological, social and economic impacts. This study aims to find out the causes of the increasing number of crime narcotics in the perspective of criminology. This type of research is an empirical research. Police officials, advocates, and narcotics abusers were taken as samples in this study. Data collection is done through interviews and documentation. The results showed that the regulation of narcotics crime prevention has not been effective in practice. Narcotics crime should have been reduced to the lowest in the presence of Act Number 35 the Year 2009 on Narcotics, but in reality, tend to increase every year. In the perspective of criminology with the observation of the age, sex, education, and work of narcotics perpetrators, it is found that multiple factors are interrelated, including psychological factors, sociological factors, and economic factors as criminal etiologies that trigger an increase in narcotics crime.

Keywords: *Narcotics crime, Criminology, Crime etiology.*

INTRODUCTION

The danger of drugs is no doubt. However, drug abuse is increasingly prevalent in various countries around the world, including Indonesia. When someone starts taking drugs, there is a high chance of experiencing addiction. The longer, the user will need a higher dose in order to feel the same effect. When the effects of drugs begin to disappear, users will feel uncomfortable due to the appearance of withdrawal symptoms and will want to use them again [(1)].

Drugs that dissolve in the body will be channeled through blood throughout the body, including the brain. The effects of drugs depend on the type consumed, dosage, duration of use, and body size of the person who consumed them. In addition to influencing the body, the danger of drugs can also cause things that interfere with a person's quality of life. An addict is also more susceptible to sexually transmitted infections, accidents, and suicide attempts due to being under the influence of drugs[(2)]

According to data quoted from the Provincial National Narcotics Agency (BNNP) of South Sulawesi, the impact of drugs includes physical, psychological, social and economic impacts. Physical effects such as nervous system disorders (neurological): convulsions, hallucinations, and disturbances of consciousness. The psychological impact is not the normal ability to think, feeling anxious. Dependence/always need medicine. Socio-economic impacts, for example, always harm the community, both economic, social, health and legal.[(3)]

Drug distribution and use at this time are very worrying. In a sign that Indonesia is a transit place for drug trafficking by the international kingpin. We should be concerned and alert to the dangers of drugs that threaten the young generation of this nation. Drugs have a very broad impact and can damage the joints of the nation's life. The danger of drugs is actually very massive, even less destructive than the dangers of corruption itself.[(4).] The crime data cited above is the result of the national scale collection of the Republic of Indonesia case. In the local scale, it is also found that crime statistics tend to increase every year. In Makassar

City in the period of 2012 till. In 2015 the crime rate was: in 2012 there were 288 people, in 2013 there were 255 people, in 2014 there were 323 people, and in 2015 there were 429 people data from Polrestabes Makassar, 2016. Only in 2013 did the number of Narcotics crimes experience a decline, which is 33 people decreased, and in 2015 again increased to 106 people.

Subjective approach is to look at individual factors as determinants of the occurrence of crime, wrong because of your own fault (SS). In essence, this approach is influenced by indeterministic theory [5]. While the objective approach is to look at factors outside individual conditions as the cause of crime, wrong because the Environment is Wrong (LS). This approach is influenced by deterministic theory.

MATERIAL AND METHOD

Research sites

This research was carried out in Makassar City, namely at the Makassar Polrestabes. The researcher took this location, considering that at that location, it was the first time that narcotics crime cases were examined by police law enforcement officers.

Type of Research

The type of research in this study is empirical research. The goal is to reveal the etiology of narcotics crime with the aim of providing legal solutions to the increase in crimes from a criminological perspective.

Data Collection Techniques

In this study interview and documentation, techniques were used. The interview technique was carried out on police law enforcement officers, advocates, narcotics abusers including users, dealers and narcotics dealers in the city of Makassar. While documentation is carried out through the collection of statistical data on crimes found in the Makassar Police

Data analysis

The data analysis method used is qualitative analysis, by analyzing and describing the data obtained both from primary data and secondary data, the results of research through a criminological approach to the etiology of narcotics crime and its countermeasures.

RESULT AND DISCUSSION

Criminology as the science of various knowledge, the body of knowledge, is dominantly defined as the science that seeks to investigate the causes of the symptoms of evil in ways that exist in it. By conducting an investigation into the causes of these crimes, this is then the scope of the study of criminal etiology which is none other than one of the main branches of criminology [6]. Related to the increasing number of narcotics crimes with a view to revealing their criminal etiology, four variables will be used which consist of the age of the perpetrator, the sex of the perpetrator, the education of the perpetrator and the work of the perpetrator.

As stated above, that because criminology uses various sciences, then to measure all four variables, it cannot be separated from anthropological approaches, psychological approaches, and sociological approaches as well as in the applied field of criminology: criminal anthropology, criminal psychology, and sociology criminal.

Age of Narcotics Crime Actors

Formulation of different criminal responsibilities between children (12 to 18 years) with adults is a further consequence of a person's cognitive phase to be able to think fully or not be able to think fully

In a psychology perspective, especially developmental psychology, adulthood should be one of the physical variables that can prevent a person from committing a crime. Ansem of developmental psychology if connected with statistics of narcotics criminals based on one's adult age, it does not support the reduction in the number of narcotics criminals. This can be noted through the following table 1:

Table 1: Number of Narcotics Crimes in Makassar City Based on the Age of the Perpetrators (2012 to 2015)

Years 10-17		Age (year)				
		18-20	21-25	26-30	> 31	
2012		15	36	59	70	122
2013		18	27	63	42	105
2014		20	39	61	75	131
2015		19	44	103	85	178
Total	72		146	286	272	536

Data Source: Makassar Polrestabes (2015)

The interesting thing from the presentation in Table 1 above is that the increase in the age of narcotics criminals is directly proportional to the increase in narcotics criminals. Physical and biological development of the stage of perfection, but perfectly cognitive is unable to hold the offender acting based on the norms of goodness contained in him as a reflection of his social environment. According to National Police Headquarters data contained in the book Population Perspective of Islam written by M Cholil Nafis, from 2004 to March 2009, there were 98,614 cases (97% more) teenage children were drug users[1].

Narcotics perpetrators from 10 to 17 years of age and 18 to 21 years of age are essentially unable to live independently. He has not been able to make a living on his own, has not been able to earn money independently, even if there is money in his hand it is usually obtained from his close relatives. He was most likely to get close to giving his mother's father. Therefore if you want to use or consume narcotics that are expensive, you will certainly be constrained from the financial aspect to buying narcotics ingredients.

Crime is learned through interaction with other people by learning techniques of crime, distinctive motivation, encouragement, rationalization, and attitude [6]. While narcotics crimes committed by adults are not influenced by totality alone. The country of Indonesia as a developing country with a poverty rate is still high, and at the same time more and more demands to live in luxury [7] [7] cause social consequences of irregularities. The deviation is by becoming a narcotics dealer so that the finances are sufficient to meet all needs that can increase its prestige.

Gender of Narcotics Crimes

Comparing the quantity of crime based on sex, the perpetrator is still a series of individual factors as their physical and psychological state. Although in examining narcotics crime by looking at the sex of the perpetrator, it cannot be separated from environmental factors. The combination of these individual factors and environmental factors is then referred to as the bio-sociological approach [3]. The quantity of narcotics criminals who are always dominated by male-sex offenders rather than a female can be considered in the following Table 2:

Table 2: Number of Narcotics Crimes in the City of Makassar Based on Gender Actors (2012 to 2015)

YEAR	Gender	
	Male	Female
2012	259	17
2013	243	21
2014	269	39
2015	369	45
TOTAL	1.140	122

Data Source: Makassar Polrestabes (2015)

Based on Table 2 above, there are two things that need to be explained further, namely: (1) Why are the number of narcotics perpetrators dominated by male

sex offenders? (2) Why do narcotics perpetrators, both male and female, tend to increase every year? Although in 2013, male sex offenders experienced a decline. The opportunity is that men who are more demanding work to be outside the home, than women are more at home taking care of their children, family, and husband's eating needs, of course, the opportunity for men to become narcotics abusers is more open than with women [8]

It is different from narcotics abusers who are female, the cause they commit crimes is not because of economic problems which are the main reason. They become more abused by their association with the workplace. In some cases the average woman is also a narcotics abuser because the family conditions are broken (broken home), so by becoming a drug user, her family's problems for a moment do not burden her mind again [9].

Education Status of Narcotics Crime Actors

The purpose of education for everyone is essential to form their personality with integrity, responsibility, and agility in differentiating a good and right decision. The analogy is that the higher the level of education a person means the more his experience goes through the process of internalization of a shared value so that the output is easier to avoid all actions that have been criticized by the community in their environment.

One research in the United States also shows that prison inmates at the "Richland Parish Detention Center," Louisiana, generally only have education in grade 2 elementary school to grade 1 junior high school (second grade to seven grade). Those with low education are always wrong in having perceptions about life and law [10]. Some of the results of the above research, in fact, contradict the results of research found on the number of narcotics crimes in the city of Makassar, when viewed from the education status of each perpetrator. It is precisely at the level of high school education, the perpetrators are more compared to narcotics criminals who are in junior and elementary education levels. More details about the conflict can be noted in the following table 3:

Table 3: Number of Narcotics Crimes in Makassar City Based on the Level of Education Actors (2012 to 2015)

Years	Education				
Elementary School	Junior High School	Senior High School	College		
2012	15	36	195	42	
2013	41	55	152	7	
2014	66	90	147	20	
2015	68	127	216	18	
Total 190		308	755	87	

Data Source: Makassar Polrestabes (2015)

Based on Table 3 above shows that the highest number of narcotics abusers occurs at the level of high school education compared to the level of elementary and junior high school education. Only the narcotics abusers with higher education status then the number of perpetrators, suddenly shows a decrease.

Apart from that which is a striking difference, so that narcotics criminals with higher education status suddenly decline, none other than because the population in Makassar city is far more high school educated than college graduates.

Job Status of Narcotics Crime Actors

A person's work will certainly be a reflection if the economic situation becomes sufficient to meet his life's needs. If many people crave a profession as a civil servant, actually they are craving for a more established economy. A person's job status that is directly proportional to the economic situation, associated with the potential or not to become a narcotics abuser is very difficult to measure.

Someone who has financial supplies, in the sense of an established economy, has the potential to become a narcotics abuser. For those in the group, even though the price of narcotics is expensive, it is definitely affordable, at least as a user.

The criminologist's conclusions about the close relationship between work and crime will be supported by the results of this study. The highest number of narcotics perpetrators is in fact played by those who are unemployed. This can be noted through the following table,

Table 4: Number of Narcotics Crimes Based on the Workers' Acts (2012 to 2015)

Occupation	Year (person)			
	2012	2013	2014	2015
Student	12	5	13	6
Collage Student	20	23	23	13
Government Employee	5	10	3	5
Private Employee	92	54	68	79
Police	5	-	1	-
Entrepreneur	59	58	67	108
Farmer/Fisherman	-	2	1	2
Daily Labour	40	46	63	95
Unemployment	71	57	84	121
Total	304	225	323	429

Data Source: Polrestabes Makassar (2015)

Based on Table 4 above shows that the highest number of narcotics abusers occupy the first position in each year (other than 2013), namely those who are only unemployed. Then followed by those who work as entrepreneurs, day laborers, and private employees. It was found in this study that narcotics criminals with unemployment status, the main factor causing them to be involved in these crimes, are mostly caused by economic motives compared to other reasons, such as severe stress so that narcotics are considered as life escape. This grouping is more dominant, the perpetrators act as dealers or bookies.

For narcotics abusers who come from the daily labor profession, the same situation applies to the entrepreneurial profession, which is only as a user, but not used during breaks. Daily laborers actually use narcotics with the aim to boost adrenaline work while eliminating fatigue after a full day's work. While narcotics offenders who come from the entrepreneurial profession and private employees are caused by their orientation in a social class. One experiences a shift from one choice to another because it is faced with different social activities. Then the narcotics offenders who come from the profession of daily labor, are mostly caused by ecological and physical factors, each of these factors intertwines, narcotics cannot be separated from their parts of life and work.

CONCLUSIONS AND SUGGESTIONS

The results of this study indicate that the regulation of narcotics crime prevention has not been effective in practice. The narcotics crime rate should have been reduced as low as possible, but in reality, it tends to increase every year. In a criminology perspective with observations of age, sex, education, and occupations of narcotics criminals, it was found that multiple factors are interrelated, including psychological factors, sociological factors, and economic factors as criminal etiologies that trigger an increase in narcotics crime rates.

Reaction to the breaking law against these crimes is by eliminating the criminogenic factor which is the cause of the crime (abolitionist system). Priority should be given to increasing employment opportunities, then counseling and education of narcotics hazards in all lines regardless of the age and profession of each

person. Police and BNN must prioritize capturing narcotics dealers because these are the main causes of the emergence of dealers in the narcotics business with very promising benefits.

Ethical Clearance: obtained from Hasanuddin University Makassar

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Multivariate Analysis of the Occurrence of Needlestick Injuries on the Nurses at X Hospital in Makassar

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ABSTRACT

Needlestick Injuries (NSI) and sharps injuries are often experienced by nurses. This research aimed to find out the factors related to the incident of needlestick injuries (NSI) on the nurses at Ibnu Sina Hospital, Makassar. The study was analytical observational using the cross sectional study approach. The Samples were chosen using the proportional stratified random sampling technique with the total sample of 107 respondents. The collected data include age, sex, years of services, education level, employment status, enabling factors, reinforcing factors and NSI incident. The data were analyzed using the Chi-Square test for bivariate analysis and logistic regression test for the multivariate analysis. The research results indicated that 66.4% of the respondents were 20 to 29 years old, 73.8% were non-permanent employees, and 61.7% had adequate enabling factors. There was a significant correlation between the age (ρ = 0.011), employment status (ρ = 0,006) and enabling factor (ρ = 0,047) with NSI incident on the nurse at Ibnu Sina Hospital, Makassar. The result of the multivariate analysis revealed the most closely related employment status with the value ρ = 0,009. Thus, the employment status was very influential on the incident of NSI, because most employees at Ibnu Sina Hospital, Makassar were non-permanent employees.

Keywords: *Needlestick injury, age, employment status, enabling factors.*

INTRODUCTION

Needlestick Injuries (NSI) and sharps injuries are often experienced by nurses. Nurses have the highest prevalence of injury among healthcare workers. Research Jaber & Farideh[1] said that the age, gender, length of <2 years and significant education with NIS in 97 health workers at a teaching hospital in Iran. Research carried out in June and December 2014 at 168 randomly selected nurses who served in different wards at the University Hospital of Shiraz, Iran said that the majority injuries occur puncture needles on the morning shift (57.8%) and the cause is 41.4% because recap needles after use (recapping needles). There is a 60.2% not report NSI with severe clinical reasons (46.7%) and the perception of the risk of infection is low (37.7%). Factors that significantly affect NSI are sex, occurred on the morning shift, work hours per week and the number of shifts per month shift[2].

Research in December 2014 in four hospitals of Southeast Ethiopia Bale zone of 362 randomly selected health workers. Nearly 6 out of 10 injuries (58.7%) were not reported. The main reason not report the injury is time constraints (35.1%), a sharp object causing injury is not used in any of the patients (27.0%), patients have no injuries source of infectious diseases (20.3%) and lack of knowledge that NSI and sharps injuries should be reported (14.9%). Half of health workers who were injured have sought medical treatment on their own initiative. Respondents with low pay six times more likely to report occurrence of NSI compared to respondents with high salaries[3]

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Number of accidents at the Hospital of Gadjah Mada (UGM) still exceeds the target of zero accident (no accident). Most accident classification by type of injury was in contact with needles and other sharp objects (69.6%), according to the cause by a portable work equipment (69.9%). Shift occurred in the morning (69.6%) in the work unit Pharmacy / Sterilization and there were 26.1% in the emergency department[4].

Research conducted at the paramedics on duty in the emergency room, hospitalizations, ICU, operating rooms and clinical laboratories Rumkital Dr. Midiyato S Tanjung Pinang November to December 2012 the dominant factor related to adherence to SOPs paramedics and universal precautions significant program with the reinforcing factors, enabling factors and factors of perception[5].

Factors that cause workplace accidents are very diverse, especially the incident of NSI. There are several instances of workplace accidents are never reported include NSI. Therefore, this study aims to analyze correlation between age, gender, education level, length of employment, employment status, enabling factors, reinforcing factors to the onset of NSI at Ibnu Sina Hospital in Makassar.

MATERIALS AND METHOD

Research sites

Research conducted at Ibnu Sina Hospital, Makassar in operating rooms, emergency departments, nursing and ICU. Starting from 24 April to 24 May 2017.

Population and Sample

The population was all nurses working at Ibnu Sina Hospital in Makassar amounted to 157 people. A sample of 112 nurses who work in emergency departments, operating rooms, patient wards and ICU selected by proportional stratified random sampling method with a sample selection of the population is not homogeneous and stratified proportional. Samples that meet the inclusion and exclusion criteria were 107 people.

Data collection

After obtaining permission to conduct the study, researchers identify and approach potential respondents to explain the purpose and benefits of their participation, as well as guarantee the confidentiality of prospective respondents. Collecting respondents who selected and according to the inclusion and exclusion criteria, to explain about informed consent and how to fill out the questionnaire, and then distributed the questionnaire to be filled. Collecting the questionnaire after complete.

Data analysis

Univariate analysis to describe of variables in general. Bivariate analysis to see some of the great associated between the independent variables of individual factors, occupational factors, enabling factors and factors reinforcing with the dependent variable (Needle stick Injury). Multivariate analysis to see independent variables most associated with the dependent variable.

RESEARCH RESULT

Characteristics of Respondents

Table 1 shows that the respondent most female sex as much as 84.1% or 90 respondents. Age of the most respondents in the range 20-29 years 66.4% or 71 respondents. Most work period on working life of > 3 years employment 82.2% or 88 respondents and the most respondents in the operating room space by 15% or 16 respondents. Most respondent employment status is not fixed employment as much as 73.8% or 79 and is the highest level of undergraduate education level, amounting to 60.7% or 65 respondents.

Distribution of Needlestick Injuries (NSI)

In Table 2 shows as much as 62.6% or 67 respondents experienced of NSI. There is a 55.1% or 59 respondents had experienced NSI 1-2 times. There is a 47.8% or 32 respondents had NSI when the afternoon shift. Respondents experienced NSI when recapping syringes practice as much as 41.8% or 28 respondents. There is a 55% or 33 respondents did not report NSI because of the possibility of infection is low.

Distribution Factors Enabling and Reinforcing factors

Table 3 shows the factors enabling adequate as much as 61.7% or 66 respondents and the reinforcing factors were adequate as much as 62.6% or 67 respondents.

Respondent Characteristics relationship on the incident of NSI

Based on bivariate analysis with test Chi-Square in Table 4 variables significantly to NSI events were age (ρ = 0.011), employment status (ρ = 0.006) and ρ = 0.047 enabling factor.

The most variable associated on the incident of NSI

The test results of multivariate logistic regression in Table 5 shows that the employment status variables (ρ = 0.009) most associated with the incidence NSI.

Table 1: Distribution Characteristics of Respondents at Ibnu Sina Hospital in Makassar 2017

Characteristics of respondents		**Sum**	
		n = 107	**%**
Gender	Man Woman	17 90	15.9 84.1
Age	20-24 years 25-29 years 30-34 years 35-39 years	18 53 24 12	16.8 49.6 22.4 11.2
Years of service	2-3 years	19	17.8
	> 3 years	88	82.2
Employment status	Non-Permanent Employee (NPE) Permanent Employee (PE)	79 28	73.8 26.2
Level of education	School of Nursing Education (SNE) / Diploma III (DIII)	42	39.3
	Bachelor	65	60.7
Room	Floor 2 Aisyah	9	8.4
	Floor 2 Aminah	8	7.5
	Floor 3 Assifaa	10	9.3
	Floor 3 Assafii	14	13.1
	4th floor	15	14
	5th floor	11	10.3
	ICU	14	13.1
	IGD	10	9.3
	OK	16	15

Source: Primary Data, 2017

Table 2. Distribution of Respondents Based on the Indicator NSI at Ibnu Sina Hospital in Makassar 2017

Indicators NSI	Sum	
	n	%
NSI (n = 107)		
Yes	67	62.6
No	40	37.4
Total NSI (n = 107)		
0 (never)	40	37.4
1-2 times	59	55.1
3-4	4	3.7
> 5 times	4	3.7
Shift (n = 67)		
Morning shift	18	26.8
Afternoon shift	32	47.8
Night shift	4	6
All shift	9	13.4
Approaching the morning to the afternoon shift change	2	3
Approaching the morning to the evening shift change	2	3
Working practices (n = 67)		
Recapping syringe	28	41.8
Implementation injection	15	22.4
Handling of specimens	4	5.9
Transfer equipment	6	8.9
Collisions with other workers	5	7.5
Improper disposal	9	13.4
Report NSI (n = 67)		
Yes	7	10.4
No	60	89.6
Reasons for not reporting NSI (n = 60)		
Fear discrimination	1	1.7
Not knowing how to report an incident NSI	20	33.3
Heavy workload	6	10
Possible lower incidence of infection	33	55
Shame on friend	0	0

Source: Primary Data, 2017

Table 3 Distribution of the Factors Enabling and Reinforcing Factors on the Nurses at Ibnu Sina Hospital Makassar 2017

Characteristics of respondents		Sum	
		n = 107	%
Enabling factors	Inadequate (score <2.5) Adequate (value> 2.5)	41 66	38.3 61.7
Reinforcing factors	Inadequate (score <6.5) Adequate (value> 6.5)	40 67	37.4 62.6

Source: Primary Data, 2017

Table 4 Relationship Characteristics of Respondents to the incident of NSI to the Nurses at Ibnu Sina Hospital in Makassar 2017

Characteristics of respondents		Occurence NSI				Sum		ρ
		Yes		No				
		n	%	n	%	N=107	%	
Gender	Man	13	76.5	4	23.5	17	100	**ρ = 0.311**
	Woman	54	60.0	36	40.0	90	100	
Age	20-29	51	71.8	20	28.2	71	100	**ρ = 0.011**
	30-39	16	44.4	20	55.6	36	100	
Years of service	New	13	68.4	6	31.6	19	100	**ρ = 0.753**
	Long	54	61.4	34	38.6	88	100	
Employment status	NPE	56	70.9	23	29.1	79	100	**ρ = 0.006**
	PE	11	39.3	17	60.7	28	100	
Level of education	SNE / Diploma III	28	66.7	14	33.3	42	100	**ρ = 0.623**
	Bachelor	39	60.0	26	40.0	65	100	
Enabling factors	Adequate	36	54.5	30	45.5	66	100	**ρ = 0.047**
	Inadequate	31	75.6	10	24.4	41	100	
Reinforcing factor	Adequate	44	65.7	23	34.3	67	100	**ρ = 0.523**
	Inadequate	23	57.5	17	42.5	40	100	

Source: Primary Data, 2017

Table 5 Results of Multivariate Analysis Variable Influencing to the incident of NSI to the Nurses at Ibnu Sina Hospital in Makassar 2017

Variables	B	SE	Wald	df	Sig.	Exp (B)	95% CI for Exp (B)	
							Lower	Upper
Employment status	1,223	0.468	6.828	1	0.009	3.396	1,357	8.497
Enabling factors	0.841	0,455	3,205	1	0.073	2,257	0.926	5.502
Constant	-1388	.390	12.655	1	0,000	.250		

Source: Primary Data, 2017

DISCUSSION

This research results obtained Chi Square test, variable employment status has a significant relationship to NSI , with values obtained ρ = 0.006. These results are also in accordance with multivariate analysis obtained by value ρ = 0.009. It is known that Ibnu Sina Hospital in Makassar more nurse status of temporary employees (non-permanent, fixed fees and prospective employees) compared to nurses permanent employee status. NSI is one of the most important issues in terms of health and safety in health services, especially for nurses. NSI can cause blood-borne infectious diseases, especially HIV that causes AIDS, hepatitis B and hepatitis C. The risk of infection after exposure to infected blood varies by bloodborne pathogens. Injury can occur at any stage of its use, demolition or disposal.

Research in the Department of General Surgery, Albany Medical Center, Albany, New York by Choi et

al (2016), said that 55% of respondents had a history NSI, a surgical nurse more frequently reported NSI than surgeons with reason patients who were at risk of infection are low and no time reporting (65%) and fear of punishment. In this study as much as 62.6% or 67 respondents experienced NSI. There are 59 respondents (55.1%) said they had experienced NSI (2012 to 2016) as much as 1-2 times and reporting on events NSI just as much as 7 respondents (10.4%) while that did not report the incident of NSI 60 respondents (89.6%) citing lower chance of infection as much as 33 respondents (55%). NSI occurred on the afternoon shift as much as 32 respondents (47.8%) and at the time recapping of syringes by 28 respondents (41.8%).

Research at the University Hospital Shiraz Iran NSI produce very high prevalence (66%) occurred in the morning shift, working practices recapping the needle, the injection device type, working hours / week and the frequency shift of the shift / month is a major factor related to NSI Jahairi et al., [2] Research in the hospital Gadjah Mada in 2015 said the accident classification majority (69.6%) were injured due to needlestick and sharps[4]. Research in Iran showed a relatively high NSI prevalence among health workers, especially at a young age and nurses who rarely attend training Age categories experienced NSI 20-29 years which included the young age. Usually young nurses tend to work in a hurry or are not careful so it tends to hurt. This study is in line with research Gholami et al[6], which is a significant age category 20-29 years ($\rho = 0.001$) and the incidence NSI. Responden more employment status not continue to have NSI. Temporary staff at Ibnu Sina Hospital was included in three (3) groups: non-permanent employees, salaries and prospective employees remain with the facilities provided are also different. This study is in line with research Jangjaer et al[7] the University Hospital of Taiwan that 21.28% NSI events tend to occur during dental nurse intern (Temporary staff) with the skills and clinical experience is still low. Amira & Awobusuyi[8] Research, said that the tenure of > 3 years of significant events NSI to nurses in Nigeria Hemodialysis Unit.

Research on hospital nurse in Bale Zone of Ethiopia by Bekele et al, said that there are (60%) of nurses had low salaries experiencing NSI and reported the incident. Which includes categories enabling factor is the hospital rarely do training in universal precautions, some nurses who have long working lives only attended 1-2 times training. This is in line with research Helmut et al[9] which says that education NSI the number of reported events NSI. Hospitals rarely provide a copy of the SOP for each medical action. Hospitals provide personal protective equipment (PPE) gloves but usually respondents do not wear it because it considers that it is common medical procedures done and the risk of infection is low[10-12].

CONCLUSIONS AND RECOMMENDATIONS

Employment status ($\rho = 0.009$) are the factors that most influence to the incident of NSI on the nurses at Ibnu Sina Hospital Makassar. Ibnu Sina Hospital should conducted precautions training and reporting of NSI way for nurses on a regular basis.

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Factors That Affect the Quality of Life of Pregnant Women

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ABSTRACT

Background : Health problems in pregnant women due to physiological changes, both physically and psychologically, have an impact on the quality of life of the mother. Physically, pregnant women experience back pain in pregnancy. It is estimated that around 50% of pregnant women will suffer from low back pain during their pregnancy or during the postpartum period. While the prevalence of depression often occurs in pregnancy by 4% to 29%.

Objective: to determine the relationship of family support, information media and ANC services to the quality of life of pregnant women in the work area of Massenga Health Center, Kab. Polewali Mandar in 2018.

Method: This research is quantitative with a study design *cross sectional*. Data collection of pregnant women is 176 respondents with questionnaire direct interviews about family support, information media and ANC services on the quality of life of pregnant women. Data analysis using the test *chi-square.*

Results: There is a significant relationship between family support and the quality of life of pregnant women (*Chi Square* p value <0.05; (p = 0,000). There is a significant relationship between counseling media and quality of life of pregnant women (test *Chi Square* p = 0,000 < 0.05) There is a significant relationship between ANC visits and the quality of life of pregnant women (test *Chi Square* p value = 0.035 <0.05)

Conclusion: Improving quality of pregnant women through family support, and information media on the quality of life of pregnant women. Suggested It is necessary to have good coordination between the Puskesmas and other health services

Keywords*: Quality Life, Pregnant Women, Family Support*

INTRODUCTION

Pregnancy is the most anticipated phase generally for women, as an expression of the sense of self and identity as a woman Pregnancy is also a worrying episode in a woman's life. adjustments to these conditions, because it can have a major effect on the physical condition and the psychological state of a woman I've never experienced it. Pregnancy for a woman is a thing that is full of happiness as well as anxiety, anxious about bad things that can befall her and her fetus, especially during labor[1].

According to the *World Health Organization* (WHO) maternal mortality is still quite high, every day around the world around 800 women die from complications in pregnancy or childbirth. According to WHO, 40% of maternal deaths in developing countries are caused by anemia during pregnancy. In 2013, there were 289,000 women died during and after pregnancy and childbirth. Between 1990-2013, the maternal mortality rate in the world (ie the number of maternal deaths per 100,000 live births) decreased by only 2.6% per year. This figure is still far from annual target of reducing the Maternal Mortality Rate (5.5%) needed to achieve the *Millennium Development Goals* 5th. Therefore the assessment of the quality of life of pregnant women is important in determining appropriate preventive measures and leads to an increase in quality of care and their well-being, with an emphasis on the health of pregnant women.[2]

The highest maternal mortality rate in Indonesia compared to other countries such as Thailand is only 44

/ 100,000 live births, Malaysia 39 / 100,000 live births, and Singapore 6 / 100,000 live births. The maternal mortality rate (MMR) and Infant Mortality Rate (IMR) in Indonesia is still high. Based on the Indonesian Maternal Health Demographic Survey (SKDI) in 2012, MMR reached 359 per 100,000 live births and AKB reached 32 per 1000 live births[3].

Based on the West Sulawesi Health Profile in 2016 the number of maternal deaths according to the regency, namely Polewali Mandar district became the District with the highest number of maternal deaths with 14 cases of death compared to northern Mamuju by 11 cases, Majene with 8 cases, Mamuju 7 cases, Mamasa 6 cases and Mamuju 1 case[4].

The quality of pregnant women can not only be reviewed for its impact on mortality aspects but also on aspects of morbidity, such as physical and psychological. Physically, pregnant women experience back pain in their pregnancies is It estimated that around 50% of pregnant women will suffer from low back pain during their pregnancy or during the postpartum period[5]. Depressed pregnant women have a lower quality of life[6]. While the prevalence of depression often occurs in pregnancy by 4% to 29%[7]. Beesides that, there are other complaints such as nausea, vomiting and fatigue that can affect the decrease in quality of life of pregnant women. The percentage of each of nausea, vomiting and daily fatigue was 33.6%, 9.6% and 44.4%.[8]

Based on the report of Massenga Polewali Mandar Health Center, in December 2016 the number of pregnant women was 596 people. Pregnant women who are at high risk are 119 people, who follow first coverage (K1) of 49 (88.59%) visits, the fourth visit (K4) is 36 visits (65.60%), while those who experience bleeding are 17 people. Furthermore, the number of pregnant women in 2017 is 605 people. There were 121 high-risk pregnant women, who followed the first visit coverage (K1) as many as 419 (69.3%) visits, while only K4 coverage was 474 (78.3%) people visited. From the observations there are still many pregnant women who do not follow the first visit coverage (K1) and the fourth visit coverage (K4) high risk pregnant women are still high.

RESEARCH METHODOLOGY

This research is a type of research quantitative with a cross sectional approach. namely observations about the influence of a variable affecting other variables simultaneously both independent and dependent variables, which are intended to analyze the relationship of quality of life of pregnant women.

The variables independent are family support, information media, and ANC services. While the variable dependent is the quality of life of pregnant women. Determination of the location of the study by purposive sampling, the number of Hami samples in this study was 176 respondents.

RESEARCH RESULTS

Univariate Analysis

Table 1. Characteristics of respondents

Characteristics	Amount	Percentage%
Age		
<20 years	12	6.8
20-34 years	128	72.7
.> 35 years	36	20.5
education		
Elementary/ equivalent	5	2.8
SMP / equivalent	62	35.2
SMA / equivalent	70	39.8
PT / equivalent	39	22.2
Employment		
IRT	148	84.1
PNS	2	1.1
Employees	4	2.3
Entrepreneurship	22	12.5
TOTAL	176	100.0

Based on the table above shows that the characteristics of respondents according to age group are generally between 20-34 year as many as 128 respondents (72.7%), at least <20 years old as many as 12 respondents (6.8%). While the data obtained by the distribution of respondents based on education shows that the majority of respondents are high school / equivalent education level as many as 70 respondents (39.8%) and the least elementary school as many as 5 respondents (2.8%).

Furthermore, the distribution data of respondents based on work shows the majority of respondents as IRT (Housewives) as many as 148 respondents (84.1%), PNS 2 respondents (1.1%), employees as many as 4 respondents (2.3%) and entrepreneurs 22 respondents (12.5%).

Bivariate Analysis

Table 2. Relationship Family Support, information media and ANC services with quality of life pregnant women.

Family Support	Quality of Life		Total	P
	Poor	Fair		
Less than	55 (64.7%)	30 (35.3%)	85 (100.0%)	0,000
Enough	30 (33.0%	61 (67.0%	91 (100.0%)	
Total	85 (48.3%)	91 (51.7%)	176 (100.0%)	
Information Media				
Less	60 (68.2 %)	28 (31.8%)	88 (100.0%)	0,000
Enough	25 (28.4%)	63 (71.6%	88 (100.0%)	
Total	85 (48.3%)	91 (51, 7%)	176 (100.0%)	
ANC Services				
Less	32 (60.4%)	21 (39.6%)	53 (100.0%)	0.035
Enough	53 (43.1%)	70 (56.9%)	123 (100.0%)	
Total	85 (48.3%)	91 (51.7%)	176 (100.0%)	

Based on the results of research conducted using Test Chi Square where the value of p value = 0,000 (p-value≤ 0.05), shows a significant relationship between family support and the quality of life of pregnant women.

Furthermore, testing the relationship of counseling media with the quality of life of pregnant women using Test results Chi Square where the value of p value = 0,000 (p-value≤0.05), indicating the existence significant relationship between counseling media and the quality of life of pregnant women.

Based on the results of research conducted at the mass health center using Test Results Chi Square where the value of p <0.05; (p = 0.035), indicating a significant relationship between ANC services and the quality of life of pregnant women.

DISCUSSION

In this study there was a significant relationship between family support and the quality of life of pregnant women. The quality of pregnant women is directly affected by family support. Meanwhile the incidence of stress with the role of family support relates indirect relationships[9]. Maintaining stress or depression during pregnancy is very important. Because women who experience symptoms of depression at the beginning of their pregnancy have a poor quality of life for their health[10]

The role of husbands is enough to affect the physical and psychological health of the mother during her pregnancy. Forms of husband's role such as delivering prenatal care, maintaining feelings in communication and giving advice on prenatal care. According to Calou[11], family support (husband) was a positive predictor and

found a significant relationship with quality of life.

In fact, according to Arini, states the importance of family support in pregnancy is very significant for women's adjustment in the first pregnancy. indicated by the correlation coefficient (r) of 0.7311 with $p < 0.01$. This means that the higher the family support, the higher the adjustment of women in the first pregnancy and vice versa[12]. Even family support is not only during pregnancy, but also has a strong correlation with the quality of life of the mother after giving birth.[13]

This is also in line with the theory that explains family as an affective function, namely family functions related to internal functions of the family in providing psychosocial protection and support for family members. Family as a source of love, recognition, appreciation, and primary source of support, Satir, in Friedman,. Therefore family support has an important concern, especially pregnant women who experience various health problems of their pregnancy.

Furthermore, the analysis of the relationship between counseling media and the quality of life of pregnant women shows a significant relationship. Therefore, the right role of counseling media can improve the health of pregnant women, and lead to the impact of improving the quality of pregnant women themselves. According to Lupton 2016, digital media can provide the information needed in detail when they have the opportunity[14].

Social media is very useful in changing general health behaviors[15]. The majority of studies report that women use the internet as a source of information about pregnancy. Women seek information at least once a month, especially the topic of fetal development and nutrition at pregnancy[16]. Besides that, it is very helpful for health workers in their efforts to improve the health of pregnant women in their working areas.

The most commonly used communication methods are 3 types. First, internet (46%), Second, talking with health care providers (33%), and third, talking to family (32%). A higher preference for talking to health care providers is high-income individuals compared to lower income[17].

Furthermore, the analysis of the relationship between ANC services and the quality of life of pregnant women showed a significant relationship. Therefore it is necessary to get the attention of health workers to improve the health of pregnant women. Even though the initial inspection visit is already high, if you look at the complete inspection (K4), it is still low. This situation occurs due to other factors, such as; the number of other health facilities and the level of mobility of the population is quite high, so there are services for pregnancy in other places as well as some pregnant women who specifically come just for maternity.

The study, supported by Nicholson[18], states that almost all women (98.9%) had antenatal examinations during pregnancy, but had less (26%) of the recommended minimum number of four visits during pregnancy[18]. Even though the benefits obtained from prenatal care are very useful. According to the WHO Antenatal Care Trial, the results of a randomized trial show that high frequency and regular visits in the third trimester can reduce perinatal mortality[19]. To increase the proportion of mothers who conducted 4 antenatal visits and improve the quality of care through the use of cell phones[20,21]

According to Chemir[22], ANC services were also determined by the level of community satisfaction. Unfortunately, based on the satisfaction rate of pregnant women who received special antenatal care services, they were only above (60.4%) who were satisfied. Difficult to increase visits of pregnant women with dissatisfaction with service[22]. Especially with the increase in the target of visits announced by WHO[23,24], a minimum of eight contacts for antenatal care can reduce perinatal deaths by 8 per 1000 births when compared to a minimum of four visits.

CONCLUSION

There is a significant relationship between family support, information media and ANC services with the quality of life of pregnant women in the Massenga Health Center area.

Suggestions

Increasing awareness of healthy pregnancies needs to be supported by the support of immediate families such as husbands and parents and information media such as social media / internet.

There needs to be good coordination to obtain real ANC visit data between Puskesmas and other non-government health services.

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Developing and Validating Low Cost Male Catheterization Mannequin as Learning Media in Clinical Skills Learning

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ABSTRACT

Background. In medical faculty, clinical skills learning has been taught since the early years. Methods in clinical skills learning need media as mannequin and standardized simulated patient. The price of mannequins is expensive and its maintenance and the availability of spare parts are difficult because of product import. Therefore, research and development of low cost and easily maintenance mannequin are needed to solve the problems.

Aims. To develop and validate low cost male catheterization mannequin as learning media in clinical learning

Method. This was a research and development study. The research start with designing, making, then validating the mannequin. There are 18 validators who are anatomist, urologist, surgeon, internist, medical educator, and general physicians.

Results. There are 3 parts of the designed male catheterization mannequin, which are outer body part, penis part, and inner structure. The anatomy of the mannequin is alike with human body. It has light weight and portable. Another advantages are easier maintenance and cheaper than standardized mannequin. Although there is smooth leak in the urethral valve.

Conclusion. Mannequin produced from this research is alow cost and high technology product that can be use as learning media in clinical skills learning.

Keywords. *Male catheterization mannequin, low cost, clinical skills, learning media*

INTRODUCTION

Clinical skills are required for medical students to become a doctor. In medical faculty, clinical skills learning has been taught since the early years. Students learn clinical skills such as communication, examination skills and procedural skills[1]. Methods in clinical skills learning need media as mannequin and standardized simulated patient.

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Mannequins are used in exchange of real human body to practice procedural skills those are invasive, so it is impossible to be applied to standardized patients. Therefore students can repetitively practice without fear of mistakes and hurting patients. Furthermore, it can increase their confidence and prepare mentally before entering clinical education in hospital[2].

There are many clinical skills that are taught using mannequins, such as Intravenous catheterization, Basic Life Support, Leopold Examination, Neonatal Resuscitation, Gynecologic Examination, Intra uterine device (IUD), Baby Delivery, Airway Management, Male and Woman Catheterization and Nasogastric Tube Insertion. According to Indonesian Medical Council that

male catheterization is a procedural skills at level 4A. It means that this skill should be performed by a doctor independently[5].

For some medical institutions, specially in developing countries, found a major problem in managing clinical skills laboratory. Budget costs for purchase, repairmen and maintenance of mannequins are enormous[3]. The price of mannequins are expensive, mostly imported products. In addition, maintenance, spare parts, and mannequin durability can be a problem for clinical skills management. Mannequin ranks first in the learning system in clinical skills before students move on to the next stage of practicing with friends, practicing with simulated patients and the latter being down directly to the community.Therefore, research and development of low cost and easily maintenance mannequin are needed to solve this problems.

METHOD

This was a research and development study. The research started with designing, making, then validating the mannequin. There were 18 validators who were anatomist, urologist, surgeon, internist, medical educator, and physicians. Data were collected through in-depth interview and analyzed in qualitative.

RESULTS

The first phase, designing phase begin with planning the material that will be use for making the mannequin. There are two main material used, which are silicone rubber and fiber. Other material will be taken from wasted material such as used bottle and hoses. There are 3 parts of the designed male catheterization mannequin, which are outer body part, penis part, and inner structure. The outer body consist of parts of stomach and thighs. The penis part consists of penis and scrotum. And the inner structure consists of bladder and urethra. Materials used were low-cost that can reduce production costs. In the outer body of the abdominal and thigh body parts used fiber and the the penis part used silicone rubber.

The second phase is making the mannequin. The step of mannequin manufacturing starts from the manufacture of outer body and penis molds using silicone rubber. The second step is to make the outer body of mannequin using resin and fiber. The next step is to make a penis part using silicone rubber added with yellow dye to find the closest color to the skin. And the last one is to make the structure in bladder using bottles and building hoses. The urethral valve uses silicone rubber.

Figure 1. Outer part of male catheterization mannequin

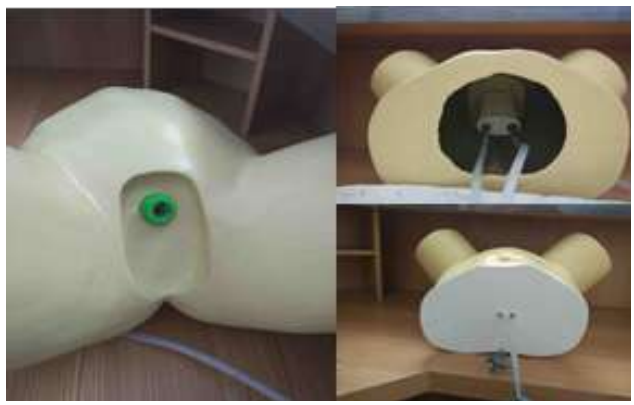

Figure 2. Inner structure of male catheterization mannequin

The third phase is the mannequin validation. The validation phase is the phase of developing the mannequin model of male catheter installation that has been created by collecting opinions from the experts about the mannequin, especially to find limitation and the feedbacks on repairing the mannequin to be realistic and can be used as learning aid. Validation is done in two stages. Validations aims to determine whether the mannequin is eligible as a tool for learning clinical skills. After the first stage validation, the mannequin will be repaired according to he feedback. Subsequently, the mannequin will be validate again by the experts as the second stage validation. At the end, there will be final revision of the mannequin that signifies the mannequin is eligible to be used as learning media.

In the first stage of validation, the mannequin was validated by the experts and 3 types of limitation were found in the mannequin. First, the glans penis mannequin looks has not been circumcised and too stiff.

Second, mannequin's urethra when can only be passed by catheter size of 12-16 while the most commonly used catheter size 18 can only enter about 5 cm. And the last the valve of bladder had not functioning optimally so that leakage of fluid when catheter inserted into the bladder.

The limitation is then corrected, then the second validation is performed. The results are the mannequin is good enough and can be used as a learning aid in the Clinical Skills Laboratory. Although there is still a lack of urethral valve is still leaking smooth, which can be repaired by adding water tape.

The advantages and limitations of this mannequin are shown in Table 1.

Table 1. The difference of standardized and low cost male catheterization mannequin

	Standardized	**Low cost**
Advantages	Mannequin is standardized	Original body-like anatomical design Lighter weight Portable Easy to maintain Production is easier and faster breaking parts Low production cost
Limitations	Expensive Difficult to maintain	Smooth leak in the urethral valve

DISCUSSION

First mannequin developed for learning purpose was cardiopulmonary resuscitation, which was called Resusci-Anne. The mannequin was developed in the early 1960s6. Nowadays, there are several research about developing low fidelity mannequin as learning media7,8,9.

Low fidelity mannequin can be used as learning media. Munshi et al said that high fidelity is not always greater than lower-fidelity. The result is depend on the type of task and the learner's level10. Conlon et al stated that there is no difference in test scores or perceived instructor or course quality among the groups who get low fidelity, mid fidelity and high fidelity mannequins11.

Mannequin are created to be simple for used. This mannequin is built from low cost and easy to find material. Alike with Kumaresan et al who developed simplified suturing model from three easily available materials7. Another advantages are easier maintenance than standardized mannequin. maintenance becomes easier because when the mannequin is damaged, it can be replaced on the damaged part only. Moreover, It has light weight and portable.

CONCLUSIONS

Mannequin produced from this research is a low cost and high technology product that can be use as learning media in clinical skills learning. The anatomical design is body-like and the sense obtained in the catheter insertion procedure has approached the original, therefore this mannequin can be used as a learning media in Clinical Skills Laboratory.

As the continuation of the research, future research needs by evaluating the usability of mannequin by students.

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Conflict of Interest – None

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New Approach for Referral Preparation to the Health Care Center in Denpasar City and Bogor Regency

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ABSTRACT

Knowledge, attitudes and skills of pregnant women to recognize danger signs during pregnancy to postpartum period and newborn baby is a strategic effort to prevent maternal and infant mortality. The aim of the study was to find out the results of guidance interventions for pregnant women and husbands using video media, pictorial fans with five finger signs, pocket books and maternal and child health books between before and after guidance at three Health Centers in Denpasar City and Bogor Regency. The study design was quasi-experimental with nonrandomized pretest-posttest with control group design. The research subjects were 204 pregnant women in the three intervention groups who had fulfill inclusion and exclusion criteria. The intervention group on the subject was divided into interventions 1 (video media, fans with five finger signs and and maternal and child health books). Group intervention 2 (pocket books, fans with five finger signs and maternal and child health books) and control groups (maternal and child health books). The instrument used was a questionnaire containing the socio demographic characteristics of the subject, knowledge, attitude and observation of skills. The results showed that there were differences in the scores of knowledge, attitudes and skills in the intervention among groups 1 and 2 ($p < 0.05$). The multivariate test results showed that there were four variables that consistently affected the skills score of pregnant women significantly including guidance intervention, maternal occupation, income and residence ($p < 0.005$). It is necessary to consider the awareness of midwives at the health center to innovate in order to increase alertness and early detection through family-based empowerment.

Keywords: *danger signs guidance, pregnancy, health center, empowerment*

INTRODUCTION

According to estimates from world health organizations or the World Health Organization (WHO), as many as 358,000 maternal deaths occur every year (WHO,1 and as many as 88-89% of these deaths can be avoided. The attitudes of health workers (especially midwives and doctors), besides motivation, knowledge and practice are other factors that influence the dynamics of the need for services that forming an important basis for improving maternal and infant health[2,3]. The maternal mortality rate (MMR) in Indonesia according to data from the Indonesian Demographic and Health Survey (IDHS) in 2012 was 359 per 100,000 live births. The MMR is much higher compared to the 2007 IDHS results of 228 per 100,000 live births.

Maternal and newborn health conditions still need serious attention from various parties, not only in Java, but also in Bali. Thus, basic efforts are carried out by midwives in order to prevent death and illness in mothers and children through efforts to increase the knowledge and awareness of pregnant women and families regarding danger signs to mothers and infants. This effort has a large impact to prevent late referrals, especially the delay in recognizing problems that generally cause delays in making decisions and referring to health facilities[4].

Maternal mortality rate in Denpasar City fluctuating quite significantly, up to 2014 MMR had been reduced to 16.1 per 100,000 live birth but increased back in 2015 and 2016. Maternal mortality rates in the Denpasar City in 2016 (54 per 100,000 live birth) still lower than the

target of the Denpasar City Health Office Strategic Plan in 2016 (100 per 100,000 KH). During 2016 in Denpasar City there were 7 maternal deaths consisting of 5 deaths of pregnant women and 2 during delivery. All mothers die in health facilities (hospitals). Four maternal deaths in Denpasar City are caused by Non Obstetric Disease, namely 2 people due to heart disorders, 2 people with dengue syock syndrome.

The main objective of this research is to compare the skills of pregnant women and their husbands / families regarding danger signs to pregnant women and infants to prevent delays in obtaining appropriate care between before and after guidance. In this study, personal guidance methods were used in the two intervention groups and one control group. Guidance media is using videos, fans with five fingers on the left and right hand regarding danger signs picture, pocket books and maternal and child health books.

We need to know the most appropriate approach to increase knowledge, attitudes and skills of pregnant women and families to prevent delays in recognizing problems and seeking help.

MATERIALS AND METHOD

The study design was quasi-experimental, pretest-posttest control group design. Respondents were divided into two groups, namely the control group and the treatment group (1 and 2). The control group (pregnant women in South Denpasar II and Ciomas) were given guidance according to the MCH books at the health center or Puskesmas. Intervention group 1 (Puskesmas I Denpasar Timur and Ciri Mekar) were given guidance using video media, fans with five fingers on the left and right hand regarding danger signs picture and maternal and child health/MCH books. Intervention group 2 (Puskesmas II Denpasar Barat and Sukaraja). given guidance using pocket books and fans and MCH books. The sample size in the control and treatment groups will be calculated according to the population of second trimester to third trimester of pregnant women in selected health centers in Denpasar City and Bogor Regency, which amounted to 34 pregnant women in each selected health center or 204 pregnant women in health center. Conducted pretest and posttest for pregnant women regarding danger signs for pregnant women and newborns. Data collection is carried out for three months (July to September 2017).

Pregnant women and husbands who were involved in intervention groups 1 and 2 were given a pretest before guidance. In the control group, pregnant women were given a pretest and were then asked to read maternal and child health books regarding danger signs and preparation for referrals. The time taken from the pretest to posttest is one month. Guidance in the intervention group and the control group was carried out after the pretest 3 meetings for one hour at each meeting. Guidance is carried out by the MCH management midwives who have been trained in the selected health care.

Data analysis was univariate, bivariate and multivariate analysis. Univariate analysis by calculating the mean. Bivariate analysis to analyze the relationship between independent variables and dependent variables, the intermediate variable with the dependent variable using paired t test and chi square analysis. Multivariate analysis to analyze the relationship between all research variables using multiple regression tests and modeling.

RESULTS

The homogeneity test shows if the respondent characteristics are generally homogeneous ($p > 0.05$). There were differences in the pretest and posttest scores in the intervention group on the score of knowledge, attitudes and skills ($p < 0.05$) except in the control group did not show differences in the skill score ($p > 0.05$). The results showed that if intervention 2 had a significant difference in knowledge, attitudes, and skills scores when compared with intervention group 1 and control group. In the table 1 below, the results of differences in pretest and posttest scores were displayed on the knowledge, attitudes and skills of pregnant women.

Table 1. Differences in Pretest and Posttest Scores between Intervention and Control Groups (n=204 pregnant women)

		adjusted variance	*z*	***p-value***
Knowledge	**Intervention group**			
	1	24650.75	2.357	**0.18**
	2	24528.00	4.431	**0.000**
	Control	25068.00	2.239	**0.025**
Attitude	Intervention group			
	1	26258.38	1.858	0.063
	2	26451.13	3.034	**0.002**
	Control	25909.38	1.948	0.051
Skill	Intervention group			
	1	26757.13	7.070	**0.000**
	2	26746.63	7.145	**0.000**
	Control	26755.13	1.284	0.199

Source : **Primary data analysis (2017)**

The multivariate test results using general linear model (GLM) analysis showed that there was no significant relationship in the intervention group and maternal age with a knowledge score ($p > 0.05$). There was no significant relationship between intervention and maternal occupational factors with attitude scores ($p > 0.05$). Consistently intervention, maternal occupation, income and place of residence were significantly associated with maternal skills scores regarding danger signs for mothers and newborns baby and neonates ($p < 0.05$). The table 2 below shows the results of the analysis between the intervention, the work of the mother, income and place of residence with the skill score.

Table 2. Results of General Linear Model Analysis between Independent Variable, Intermediate and Skill (n=204 pregnant women) in 2017

	Skills				
	coeff	**z**	**p**	**95% CI**	**AIC**
Intervention group 1 2	 7.198 14.083	 3.52 8.61	 **0.000** **0.000**	 10.875 -17.291	
Mother occupation	4.356	2.98	**0.003**	1.494 -7.219	
Family income	-7.746	-4.20	**0.000**	-11.365 -4.127	
Residence	-8.217	-3.19	**0.001**	-13.263 -3.171	
Husband education: Middle High	 1.783 1.719	 1.27 0.76	 0.204 0.446	 -0.967 – 4.532 -2.704 – 6.142	7.275
Health assurance	-1.166	-0.88	0.380	-3.769 – 1.436	
Age	1.200	0.79	0.430	-1.778 – 4.179	
Husband occupation	-1.376	-0.36	0.721	-8.919 – 6.166	
Constanta	13.773	3.65	0.000	6.371 -21.175	

Source : Primary data analysis (2017)Discussions

In general the characteristics between the intervention groups were not different (p> 0.05). Differences were found from the characteristics of income or socio-economic level, residence, and means of transportation used by subjects to health facilities (p <0.05). The sociodemographic characteristics of the subject can affect service quality as measured by knowledge, attitudes and skills the subject knows and manages the problems faced.

According to the World Health Organization[1], there are several determinants that influence client visits to health facilities, especially to obtain reproductive health services, including: financing factors or ability to pay, distance factors to health facilities, client knowledge, education level and social status economy. Agreeing with the results of a study in Ethiopia by Tesfahun, Worku, Mazengiya, Kifle[5], that maternal health care utilization is influenced by accessibility factors, socio-cultural beliefs, individual attitudes and health seeking behavior.

There were differences in the pretest scores of knowledge, attitudes and skills between the intervention group 1 and 2 and the control group significantly (p <0.05), although the results showed that the most significant difference was in the intervention group 2. The skill score showed that only the control group who did not show a significant difference (p> 0.05) when compared with intervention group 1 and 2. This was caused by factors of resistance or design invalidity, including: the interaction of the given test, the interaction of the results of the selection with the results and the existence selection with the results and the existence selection bias[6].

The selection bias in terms of the invalidity of interaction factors from the intended test is that there is a weakness of the video media in the intervention group 1 due to the availability of a video watching device at home that is not shared by all subjects in the group, in addition to the obstacles that explain content or content of the video. Another problem with invalidity is that the characteristics of the subject from the beginning have been different, especially in the intervention group two which shows if the initial results of the pretest are much higher than the other groups[6].

There was no significant difference between the pretest and posttest scores according to the characteristics of the transportation facilities and the distance to the health facilities with scores of knowledge, attitudes and skills (p> 0.05). Knowledge, attitudes and skills of individuals or subjects are influenced by socio-economic factors, values that are believed, and intention to behave. Different results were obtained by Tesfahun,

Worku, Mazengiya, Kifle[5], that the factors that influence the utilization of postpartum care are: time constraints, transportation costs, shelter, distance from home to health facilities, previous ANC history and ability health workers provide solutions to problems faced.

The results of multivariate tests using GLM were obtained if there was only a very significant relationship between intervention, maternal work, family income, and place of residence with a skill score ($p < 0.05$). The results of the study by Amenu, Mulaw, Seyoum & Bayu[7] and Salam, Lassi, Das and Bhutta[8] that positive health behaviors are influenced by various factors, including: complex phenomena related to availability, quality, service financing, structure social, health beliefs and characteristics of clients or service users[9] .The success of communication between midwives and clients or pregnant women greatly influences patient / client satisfaction, increases understanding, increases mutual trust and increases the ability of pregnant women and families in decision making[10]. Mother's knowledge is not directly affected by the number of ANC visits due to differences or gaps between the ability of officers / midwives and the limited information provided by midwives regarding danger signs to mothers during pregnancy to postpartum, newborn baby and neonates[11-15]. The husband's education contributes to the participation of husbands in delivering mothers to health facilities and helping to make decisions more precisely and quickly[16].

CONCLUSION

The use of media and interesting information delivery techniques are determinants of the success of training. It is necessary to consider the characteristics of the research subjects, such as the availability of VCD devices, other communication media in the form of mobile phones for intervention groups that receive training using video media.

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The Difference Existence of Aedes sp Larvae based on Ovitrap Locating in Samarinda City Indonesia

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ABSTRACT

Dengue Fever is a worldwide health problem including Indonesia. Samarinda, as the capital city of East Kalimantan Province, has incidence of dengue fever every year. Generally, *Aedes sp* found inside and outside of the houses. Prevention of dengue fever could be done by some ways. One of alternative is utilization of ovitrap as a trap of larvae. This study would like to comprehend the difference existence of *Aedes sp* larvae based on locating inside and outside of the house. Research design was quasi-experimental design posttest only used control group without randomization. Ovitrap has been placed inside and outside of the house in 30 samples of the houses. Larvae existence monitored after a week of ovitrap locating. Observation result compared between ovitrap locating inside and outside of house. The research result showed that there was a difference existence of *Aedes sp* larvae based on ovitrap location (p value: 0.000 <0.05, significantly different). *Aedes sp* larvae found more in the outside of the house of ovitrap location. Ovitrap could be used as the alternative of survey device of *Aedes sp* larvae existence in the dengue fever high risk area to prevent and control the density of *Aedes sp* in the community environment.

Keywords: *Ovitrap, Aedes sp Dengue Fever*

INTRODUCTION

Dengue fever is a public health problem in the world.. There were 2.5 billion of population (40%) was located in the high risk area of dengue fever. There were 500.000 cases and 22.000 mortality every year. Population of South East Asia country placed about 70% of citizen with high risk of dengue fever [1]. Indonesia is an endemic area of dengue fever in the South East Asia area . Based on the Indonesian Health Profile in 2014, there were 100.347 cases with 907 mortality cases happened in 34 provinces in Indonesia (IR: 39.80/100,000 citizens, CFR : 0.90%). East Kalimantan Province was a province with the highest cases of dengue fever in 2014 with 4.752 cases and 55 mortality cases (IR: 135.46/100,000 citizens, CFR: 1.16%). In 2012-2014, there were 11.612 cases[2]. Samarinda is the capital city of East Kalimantan. Report from Department of Health of East Kalimantan showed that in 2014, Samarinda was a city with the highest incidence with 1147 cases (IR : 118.7%, CFR :1.24%). One of area with the incidence was Harapan Baru Sub District. The data of Department of Health Samarinda 2015 showed that Harapan Baru Sub District had increasing of dengue fever cases in 2013 – 2015 which included 8 cases (2013), 45 cases (2014) dan 87 cases (2015).

Geographically, *Aedes sp* mosquitos found more in the city and related to the water storage building. *Aedes sp* larvae found more in the indoors rather than outdoors. Flower vase, water storage bucket, bathroom water box, and water storage teapot were some indoors places for mosquito's development. Outdoor places included former wheel, former bottle, former glass, cuts of bamboos, and bird drinking storage and other water containers which can save the rain water could be some places for mosquito's development. The dengue fever controlling could be done by the government and community independently. It caused by the dengue fever could decrease the quality of public health. There are some ways to control the dengue fever include chemical control used larvacide and imagocide, biological control used the microorganism care through the larvae eater, environmental control and self protect used *repellent*[3].

Using ovitrap (egg trap) could be done to decrease the risk of dengue fever in the environment. Utilization of ovitrap included a black water container given by enough water and closed by the filter paper. The ovitrap then placed outside and inside of the house in the dark and moist environment.

The result studies about ovitrap showed that ovitrap could be used for monitoring and controlling *Aedes sp* development in the environment. Ovitrap is an economic, specific, and sensitive controlling alternative to the sampling in the wider area. Positive larvae ovitrap of *Aedes sp* could be used as the surveillance device to indicate the real existence of *Aedes sp* mosquitos in the real environment. The decrease of density of *Aedes sp* mosquito will influence to the decreasing of dengue fever virus transmition and finally decrease the risk of incidence of dengue fever in the community.

MATERIAL AND METHOD

This research was analytic research used quasy experimental approach with posttest only control group design. The research aim was to comprehend the difference existence of *Aedes sp* larvae based on locating inside (indoors) and outside (outdoors) of the house. Population of this research was 69 houses in area of household 22. Sampling technique used purposive sampling with inclusion and exclusion criteria. Samples were 30 houses. One ovitrap located inside and outside of 30 houses. Observation did after a week ovitrap locating through larvae checking at ovitrap inside and outside of the house. Instrument used on this research was observational paper of Aedes *sp* larvae existence. Larvae checking did by the larvae monitoring group at the research location. The result of observation of larvae at ovitrap then compared between the result of ovitrap inside and outside of house. Data analysis used *Chi Square* test to compare the difference between two nominal scale variables.

RESULTS

Ovitrap used in the black bucket filled by half of water and closed by the curved filter fabric touch the water surface in the bucket with ovitrap then tighten by the rope in the outside. This study placed the 60 ovitraps in the 30 samples of houses. Each of them divided to 30 ovitraps outside the house and 30 ovitraps inside the house. Ovitrap has been placed in the potential place for *Aedes sp* mosquito's development. Indoors placing was inside of the rest room or the kitchen as the dark place without disturbing the house owner activity. Outdoors placing was around the dark and moist garden without disturbing the daily activity. After a week of ovitrap placing, it has been examined for the larvae existence at the ovitrap inside or outside of the sample's house.

Regarding to the observation, the outdoors ovitrap with larvae inside found in the 24 ovitraps between 30 ovitraps. In the indoors ovitrap, there were 10 ovitraps with larvae inside between 30 ovitraps. *Chi Square test* showed that *Asymp.Sig.(2-sided) Pearson Chi-Square* was $0.000 < \alpha : 0.05$), H_0 was rejected. It can be concluded that there was significance difference of *Aedes sp* larvae existence based on ovitrap locating inside and outside of the house in Harapan Baru Sub District Samarinda City. Outdoors ovitrap had more larvae compared with the indoors one. It indicated that the *Aedes sp* mosquito's population more found in the outside of the house rather than inside of the house in Harapan Baru Sub District Samarinda City.

DISCUSSION

Indonesia is the endemic country with the high number of dengue fever cases. Outbreak has been happened during 3-5 years in Indonesia that caused the mortality especially for children[4]. From the past till the recent, there was no any vaccination found to the dengue fever disease. The best prevention of dengue fever is controlling the vectors of *Aedes sp's mosquitos5*. High density population, poor sanitation, and the easiness of transportation accessibility from one place to the other place will help the *Aedes sp* mosquito's distribution to the human environment.

Enthomology survey used the ovitrap mostly used to detect the existence and distribution of the *Aedes sp's* mosquitos in the community environment. Mosquito's survey used the ovitrap was more economically efficient, sensitive and reliable to detect the existence of *Aedes sp's* mosquitos rather than the container survey[6]. Ovitrap utilization will be effective in a week. If it placed more than a week, the ovitrap could be a new place of *Aedes sp* mosquito's growth and development. Ovitrap placing could be used as the accurate device to observe the *Aedes sp* mosquito's growth in the community household[7].

The study result based on the larvae observation in the ovitrap locating showed that the ovitrap with the positive larvae inside were found more in the outdoors

rather than indoors. The result was the same with the research of ovitrap locating in Bandung city which found that Aedes *sp* found more in the outside rather than inside of the house [8]. The other study found that there was *Aedes sp's mosquito's* egg more in the outside of the house in the Kranji village of working area of the East Purwokerto Public Health Center II [9]. The other supporting study was a study in the Uttarakhand State in India which found from the surveillance of ovitrap that the highest index number of ovitrap is in the outside of the house placing rather than in the inside of the house [10].

The different findings found that the total analysis of the *Aedes sp* mosquito's egg from the ovitrap observation in the indoor and outdoor were not different significantly which means that *Aedes sp* mosquito's larvae indoor and outdoor was not different. In fact, there was found that amount of egg at the ovitrap which is placed outdoor was more than the indoor. In the indoor setting, ovitrap has been placed in the bedroom, kitchen, restroom, and the other closed rooms. Outdoor placing involved areas around the garden such as in the flower vase, around the trees, near the hedge or the other open places. In the outdoor ovitrap, it found that more larvae of *Aedes sp's* mosquito, it caused by the more amounts of the storage room and animal's stable. Those condition help the *Aedes sp's* mosquito to find the food source (blood animal) and made it as suitable place for growing an developing of *Aedes sp's* mosquito[11].

The amount of ovitrap which contain the *Aedes sp* larvae in the environment caused by the location of study was the area with the high incidence of dengue fever. Generally, amount of the egg will found in the area with high incidence of dengue fever rather than the lower one 12. Moreover, the *Aedes sp* larvae existence found more in the outside of the house caused by some factors. One of them is the community environment condition which increased the *Aedes sp's* mosquito's growth. Study location was an area with the swamps which has high moist condition. The study location bordered with the forest that contained of many trees for mosquito's place. The other factor was the community habit to save the rain water in to use in the daily need. Aedes sp's mosquito's places for growth were the water container place inside or around the house which is not directly touch the sands. That kind of place such as the drum, bucket, water box, banana stem, cuts of bamboo, piece of coconut shell, flower vase or the former can around the house [13].

The other condition that could influence the *Aedes sp's* larvae existence was the high density in the study location due to the city area which only had the short distance between one house to the other houses. The distance between the buildings was a factor that could influence the mosquito's spread. The more the distance between the buildings, the more the mosquito could spread in the community environment [14,15].

The other result form the other study found the different result, which showed that from the ovitrap observation, the larvae found more in the inside of the house more than the outside of the house. The *Aedes aegypti's* mosquitos found more inside of the house and the *Aedes albopictus* found more in the outside of the house [6]. Studies about utilization of ovitrap in Malaysia showed that most of *Aedes albopictus* larvae positive found in the environment outside of the house with the ovitrap raneg index (37-78%) compared than the *Aedes aegypti* larvae index (8-47%) [16]. *Aedes sp's* mosquito had a habit which prefers to take a rest in the dark, moist, and hide place. It could be affected to the placing of mosquito's egg of *Aedes sp* [17,18].

Dengue fever prevention and controll in an area should be done quickly with the right method. The first step to determine the prevention effort from the government and the community was enthomology survey used the ovitrap. Ovitrap is a simple device which effective and efficient to find the existence of *Aedes sp's* mosquitos in the community residence. By finding the existence of the *Aedes sp's mosquito's* existence inside and outside of the house hopefully could help the community to determine the independent prevention efforts to *decrease* Aedes *sp's growth*. The effort hopefully could decrease the *Aedes sp* mosquito's spread and decrease the risk of dengue fever in the community environment.

CONCLUSION

Regarding to the research result, there was a difference of *Aedes sp* larvae existence in the environment based on the ovitrap locating inside and outside of the house. *Aedes sp* larvae found more in the outside of house compared with the inside of house. Generally, the supporting studies showed that the *Aedes albopictus* was a common type found in the outdoors. *Aedes aegypti* found more indoors. *Aedes sp* larvae Existence which is found outside of the house could be influence by the local environment. Ovitrap could be used

as the alternative device for *Aedes sp* larvae existence survey, especially in the high risk area of dengue fever. Moreover, the ovitrap could be used for controlling the *Aedes sp* mosquitos development which worked as the effective and efficient trap of larvae to be used with the community. The efficient utilization of ovitrap could decrease the population of *Aedes sp* mosquitos in the environment and decrease the risk of dengue fever cases.

Ethics approval and consent to participate

This study did not involve living things (humans or animals) directly in the experimental research conducted. But to fulfill the research ethics in the field, informed consent was provided to the research location community to give permission for the implementation of the research.

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Relationship of Sleep Quality with Student Learning Motivation in Nursing Academy 17 of Karanganyar

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ABSTRACT

Sleep quality is a measure of where the person is obtained the ease in starting and maintaining sleep, sleep quality of someone can be described with a long sleep and perceived grievances while sleeping or after waking up sleep. Sleep patterns that are less good or less sleep will be bad for psychicsc one of them is declining student learning motivation, thought processes and decrease in brain activity. The motivation of learning influenced several factors such as physical, psychological factors, social and non-social. This research aims to know the relationship of sleep quality with students ' learning motivation in Nursing Academy 17. The type and design of the research is quantitative with cross sectional approach. The number of population are 39 respondents. The technique of sampling method is the total sampling, and the data collection using the questionnaire. The analysis of this study uses univariate and bivariate analyses. The Chi Square test results show the value of 0.005 p $\alpha \leq 0.05$, so it can be concluded that there is a relationship of sleep quality with the learning motivation of students in Nursing Academy 17 of Karanganyar. Someone with a good quality of sleep has a high learning motivation, but a bad sleep quality did not result in a decline in students ' learning interest significantly.

Keywords: *quality of sleep, motivation, motivational learning*

INTRODUCTION

Rest and sleep are basic needs that are very and needed for human health. Everyone needs rest and sleep so that the body can function normally. When we rest and sleep the body will do the recovery process so that when we wake up the body condition becomes optimal and can carry out daily activities[1,2].

Several factors that influence the quality and quantity of sleep are physiological factors, psychological factors, environment and lifestyle. From the physiological factors have an impact with a decrease in daily activities, weakness, fatigue, decreased immune system, and instability of vital signs, while psychological factors impact depression, anxiety and difficult to concentrate[3,4].

Learning motivation is internal and external encouragement to students who are learning to conduct behavior, in general with several indicators or supporting elements. These indicators include: successful desire and desire, encouragement and needs in learning, hopes and aspirations for the future, appreciation in learning, and a conducive learning environment[5-7]. Motivation is closely related to one's desire to learn and carry out tasks in fulfilling his developmental tasks entering young adulthood. Dariyo (2008) states that young adults are those who are generally aged 20-40 years. Most young adults sleep at night an average of 6 to 8.5 hours a day, but in this case vary[3]. The prevalence of adults who experience sleep disorders is still high, the data from WHO (World Health Organization)5 ± 18% of the world's population have experienced sleeplessness (Lanyawati, 2001). In Indonesia, the exact number of people who experience sleep disorders is unknown, but the prevalence in adults reaches 20% [8]

Based on Fitri Rahmawati's study of the relationship between sleep quality and student learning interest, the results of the analysis showed that there was a significant relationship between sleep quality and learning interest. These results indicate that the higher the PSQI score, the

higher the interest in learning or the worse the quality of sleep, the lower the interest in learning. However, poor sleep quality does not result in a significant decrease at student learning interest.

MATERIALS AND METHOD

This study uses a *quantitative* research design with the approach used is a *cross sectional* approach. The population in this study were students of the first grade of Nursing Academy 17 of Karanganyar, with total amount of 39 students. While the sampling technique used in this study with *total sampling* is to use the entire population of 39 students. The independent variable of this study is sleep quality while the dependent variable is learning motivation. Data collection tools in this study used a sleep quality questionnaire, *the Pittsburgh Sleep Quality Index (PSQI)*, while the learning motivation questionnaire was modified by Dewi, 2014. Data analysis consisted of univariate and biavariate analyzes. Univariate analysis is used to see each frequency distribution variable, in this study univariate analysis is presented in table form, while bivariate analysis is used to see the relationship between variables. *Bivariate* analysis in this study using *chi square* test.

RESULTS AND DISCUSSION

Table 1 Frequency Distribution of Respondents by Gender and Age

	amount	
Characteristics	Frequency (n)	Percentage (%)
Gender		
Man	8	20,5
Woman	31	79,5
Total	39	100,0
Age		
18-19	33	84,6
20-21	5	12,8
22-23	1	2,6
Total	39	100,0

Based on the results of frequency distribution in table 1, it was found that students from the first grade of Nursing Academy 17 of Karanganyar showed that 39 respondents surveyed, respondents are male respondents they are 8 respondents (20.5%) and women are 31 respondents (79.5%).

Frequency distribution results in the table 1 shows that respondents with the aged 18-19 years are 33 respondents (84.6%), aged 20-21 years are 5 respondents (12.8%) and those aged 22-23 years are 1 respondent (2.6%).

Table 2. Frequency Distribution of Respondents Based on Sleep Quality

	Amount	
Variable	**Frequency(n)**	**Percentage (%)**
Sleep Quality		
Good	17	43,6
Bad	22	56,4
Amount	39	100,0

Based on Table 2, it is known that students from the first grade of Nursing Academy 17 Karanganyar show that from 39 respondents who are researched, the respondents who have good sleep quality are 17 respondents (43.6%) and those who have poor sleep quality are 22 respondents (56.4%).

Table 3. Frequency Distribution Based on Student Learning Motivation

Variable	**Amount**	
	Frequency (n)	**Percentage (%)**
Learning Motivation		
Low	12	30,8
Medium	13	33,3
High	14	35,9
Amount	39	100,0

Based on Table 3 it is known that students' learning motivation from the first grade of Nursing Academy 17 Karanganyar shows that the respondents who have low learning motivation are 12 respondents (30.8%), and who have moderate motivation learning are 13 respondents (33.3%) and who have high learning motivation are 14 respondents (35.9%).

Table 4: Relationship between Sleep Quality and Student Learning Motivation

		Learnig Motivation				Score	
Sleep Quality	**Low**	**Medium**	**High**	**Total**	**r**	**R square**	**P**
Good	1	6	10	17	0, 316	10,513	0,005
Bad	11	7	4	22			
Amount	12	13	14	39			

The results of table 4 can be seen from the results of the *chi square* test of 39 samples obtained 17 respondents with good sleep quality who have high learning motivation are 10 respondents, moderate learning motivation are 6 respondents, and poor learning motivation are 1 respondent, while respondents who have poor sleep quality that have high learning motivation are 4 respondents, moderate learning motivation are 7 respondents and low learning motivation are 11 respondents.

The *chi square* test results on 39 samples produced a statistical value (X2) of 10,513 with a significant level of 0,05 which was 0,316 obtained p value 0,005 where p value <0,05. Thus it was concluded that Ha was accepted that is the relationship between sleep quality and student learning motivation. Even so, there is out the possibility that there are respondents who have good sleep quality but low learning motivation and vice versa who have poor sleep quality that high learning motivation this is because there are other factors that influence learning motivation other than sleep quality.

CONCLUSIONS AND RECOMMENDATIONS

Based on the research conducted on 39 respondents about the relationship of sleep quality with students learning motivation at Nursing Academy 17 Karanganyar, shows that respondents who have good sleep quality as many as 17 respondents (43.6%) and who have poor sleep quality are 22 respondents (56.4%) while respondents who have low learning motivation are 12 respondents (30.8%) who have moderate learning motivation are 13 respondents (33.3%) and who have high learning are 14 respondents (35.9%).

The results of the *chi square* test showed a significant relationship between the quality of sleep with student learning motivation with statistical values (X2) of 10.513 with a significant level of 0.05, namely 0.316 obtained *p value* of 0.005 where *p value* <0.05. It can be concluded that there is a relationship between sleep quality and learning motivation of first-grade students at Nursing Academy 17 of Karanganyar.

Students should improve the quality of their sleep, so that the quality of sleep will be better so learning motivation that is still low can be improved. However, students are also expected to maintain high learning motivation and increase the spirit of learning so that the achievement will increase.

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The Risk of Disease Transmission from Bat's Bacteria to Humans and other Animals

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ABSTRACT

Bats are suspected as vectors of some diseases. Bat area roaming large enough and has a complex social structure makes the bat more interesting and unique to discuss the risk of disease transmission to humans and to other animals, especially from bacteria that exist in bats. The study was conducted from March 2017 to March 2018. The research sites in the southern region of Lombok Island consist of SelongBelanak, Semeti, Areguling, Kuta and Tanjung Ringgit. Bats were collected using mistnet Bacterial data collection comes from examination of the mouth, nose, feces, and bowel bats. The identification of bacterial based on colony morphology observation. The results show that there are 14 species of bacteria isolated from 4 species of bats. Species of bacteria are *Providencia stuartii, Aeromonas caviae, Citrobacter freundii, Eschericia coli, Serratia ribidaca, Klebsiella oxytoca, Acinotobacter calcoaceticus, Alcaligenes xylosoxidans, Neisseria siccca, Staphylococcus aureus, Providensia penneri, Proteus vulgaris, Citrobacter freundii,* and *Citrobacter aerogenes.*

Keywords: *Bats, Disease, Bacteria, Humans, Animals*

INTRODUCTION

The existence of bats is very important for people's lives, namely as a complement to the ecosystem, for example, bats can be dispersed fruit seeds including *Annacardiumsp, Adenatherasp, Ceibasp*, Convolvulaceae, Poaceae, *Syzygiumsp, Musa sp, Muntingiasp,* and *Annonasp*, pest control insects, and guano fertilizer producers[1]. In addition, Wijayanti[2] states that bats can act as key providers of ecosystem energy (the key factor in cycle energy) for organisms that are in the cave. Related to this, caves play an important role in maintaining the existence of bats. But there are concerns about humans and animals that interact with bats and concerns about the bat population.

Bats have recently been reported to carry several diseases that are harmful to humans and animals. According to Veikkolainen et.al[3], states that bats are effective reservoirs for the presence of human pathogenic bacteria. Some of these diseases are carried by several organisms or bacteria that live in the body of the bat. Microbes are one that is in the body of a bat. The presence of microbes can have a beneficial and detrimental impact. The beneficial impact on bats as revealed by Hyot, et.al[4] states that bacteria found naturally in bats can inhibit the growth of *Pseudogymnoascusdestructans*. So that it can protect bats from white-nose syndrome (White Nose Syndrome) and some other diseases among influences for individuals, populations, and species. Adverse effects of bats can cause several diseases to humans or other animals. Common types of bacteria found in bats are *Bartonellamayotimonensis*[3,5], *Pasteurellaspp, Leptospirasp, Salmonella sp,* and *E.coli* [6].

The abundance of microbes in bats is quite high, almost all types of bats have species of bacteria with various species that are diverse and even the same. This is caused by the bat's life behavior which consists of many colonies in one perch area. Bats can infect humans and animals because they have a close relationship. For

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example, the human interaction that enters the cave where the bat habitat is located, besides the presence of bats that are close to human settlements and the tendency of humans to use guano as biological fertilizer[7,8]

Based on the description above, researchers feel interested in conducting research on the risk of transmission of diseases from bat bacteria to humans and animals. This research was carried out considering the bat spread is quite broad and very close to the daily lives of humans and animals. This study identified bacteria in several parts of the body of the bat including the mouth (saliva), feces, nose (nasal fluid), the whole body.

MATERIAL AND METHOD

Research Site

The study was conducted from March 2017 to March 2018. The location of the sampling was carried out in the southern part of Lombok Island, the location determination was based on the abundant distribution of bats in the area (9). In addition, the sampling location is a tourist area located on the island of Lombok. The sampling locations included Mount Prabu, SelongBelanak, Semeti, Areguling, Kuta and Tanjung Ringgit. The following is a map of the sampling location in Figure 1.

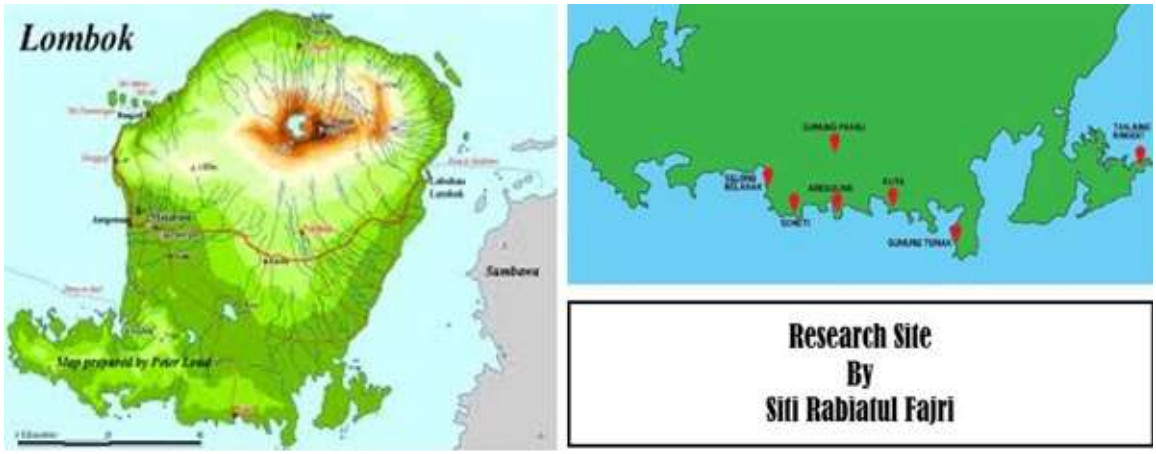

Figure 1. Research Site

Observation of Microba

Examination of microbial samples found in bats by examining several parts of the body from bats includes mouth swabs (saliva), feces, nasal cavity (nasal fluid) and smears throughout the body. Identification of bacteria can be carried out based on colony morphological observations, microscopic observations using various staining reactions and biochemical tests. Colony morphology observations include observation of the shape and color of colonies[10]. Gram staining is used to determine bacterial morphology and distinguish between Gram-positive bacteria and Gram-negative bacteria. Furthermore, bacteria can be identified through various biochemical tests, including carbohydrate fermentation test, Triple Sugar Iron Agar (TSIA) test, motile test, indol test, citrate test, Methyl Red (MR) test and Voges Proskauer (VP) test.

RESULTS

Bacterial examination was carried out on 4 species of bats obtained in 6 locations in the southern part of Lombok Island. Examination of bacteria in 4 bat species is based on the abundance of these species in the southern region of Lombok Island based on Fajri et al[9] report. 4 species of bats include *Eonycteris spaleae, Hipposideros diadema, Rhinophoma microphylum* and *Rhinolopus simplex* (Figure 2).

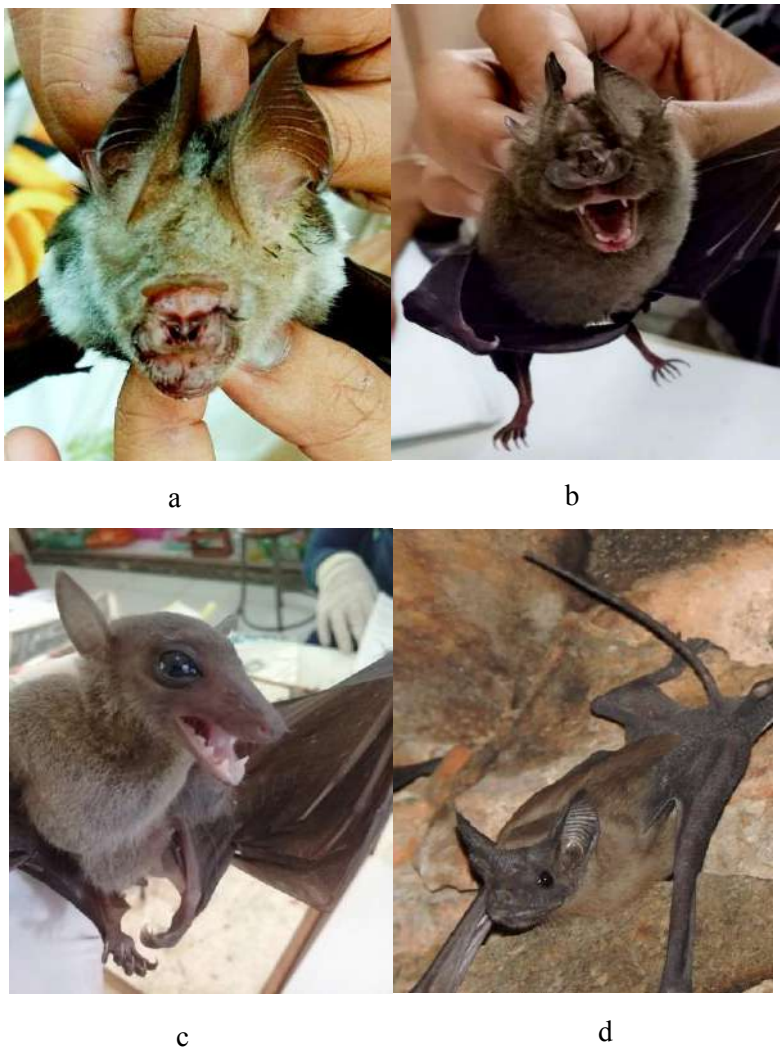

Figure 2. Species of bats; a. Hipposideros diadema, b. Rhinolopus simplex, c. Eonycteris spaleae and d. Rhinophoma microphylum

Based on the results of examination of bacterial species in 4 species of bats, there were 14 species of bacteria that were identified. The species include Providencia stuartii, Aeromonas caviae, Citrobacter freundii, Escherichia coli, Serratia ribidaca, Klebsiella oxytoca, Acinetobacter calcoaceticus, Alcaligenes xylosoxidans, Neisseria sicca, Staphylococcus aureus, Providencia penneri, Proteus vulgaris, Citrobacter freundii, and Citrobacter aerogenes. Example of a bacteria colony in Figure 3.

Figure 3. Colony Bacteria

Eonycteris spaleae is one of the bats that have abundance high enough in the southern part of Lombok Island, its presence in all sampling sites. Considering that this research is interested in identifying bacteria in some parts of the body. based on the results of the study there were 5 bacteria that were identified among themProvidencia stuartii, Aeromonas caviae, Citrobacter freundii, Eschericia coli, and Serratia ribidaca. Hipposideros diademais one of the bats whose existence is found in the Tanjung Ringgit cave and the Buwun cave. This bat successfully identified 6 species of bacteria among themKlebsiella oxytoca, Providensia stuartii, Acinotobacter calcoaceticus, Alcaligenes xylosoxidans, Neisseria sicccaand Eschericia coli. Rhinophoma microphylumis a new record species on the island of Lombok[11]. the existence of this bat is found in the Buwun cave and the Gale-gale Bangkang cave. this study managed to find 2 species of bacteria in the body of Rhinophoma microphylum. the bacterial species include Staphylococcus aureusand Providensia penneri. Rhinolopus simplex is a bat found in Gale-gale Bangkang cave and Buwun cave. from this bat managed to identify 3 species of bats among themProteus vulgaris, Citrobacter freundii, and Citrobacter aerogenes. More details can be seen in Table 1.

Table 1. Microbes in Bats

No	Bat Species	Inspection Location	Gram	Bacterial Species
1	*Eonycteris spaleae*	Mouth (saliva)	Gram-NegativeCocobacil	*Providencia stuartii*
			Gram-NegativeBacil	*Aeromonas caviae*
		Nasal cavity	Gram-NegativeBacil	*Citrobacter freundii*
		Feces	Gram-NegativeBacil	*Eschericia coli*
			Gram-NegativeBacil	*Serratia ribidaca*
		Whole body	Gram-NegativeBacil	*Eschericia coli*
2	*Hipposideros diadema*	Mouth (saliva)	Gram-Negative Bacil	*Klebsiella oxytoca*
			Gram-Negative Bacil	*Providensia stuartii*
		Nasal cavity	Gram-NegativeCocobacil	*Acinotobacter calcoaceticus*
		Feces	Gram-Negative Cocobacil	*Alcaligenes xylosoxidans*
			Gram-Negative Diplococcus	*Neisseria siccca*
		Whole body	Gram-NegativeBacil	*Eschericia coli*
3	*Rhinophoma microphylum*	Mouth (saliva)	Gram-NegativeCoccus	*Staphylococcus aureus*
		Nasal cavity	-	-
		Feces	Gram-NegativeCocobacil	*Providensia penneri*
		Whole body	-	-
4	*Rhinolopus simplex*	Mouth (saliva)	Gram-NegativeBacil	*Proteus vulgaris*
		Nasal cavity	-	-
		Feces	Gram-NegativeBacil	*Citrobacter freundii*
		Whole body	Gram-NegativeBacil	*Citrobacter aerogenes*

DISCUSSION

Based on the results of the study, there were 14 species of bacteria that were identified from several parts of the body of the bat. The goal is to find out what kind of bacteria there are in some parts of the bat's body. Thus, it can be a reference if there is an interaction with bats in their habitat or in human habitation. Bacteria that have been identified are harmful bacteria that can cause disease in organisms that interact with them, for example, humans or other animals. The presence of bacteria in bats comes from food sources and bat-foraging habitats, even

though he knows very little about this. Bacteria found in bats can become reservoirs and zoonotic pathogens in humans and other animals.

Bacteria in this study that are commonly found in bats are *Citrobacterfreundii, Escherichia coli, Klebsiellaoxytoca, Proteus vulgaris, Providenciapenneri, Providenciastuartii*, and *Staphylococcus aureus*. The bacteria have also been reported in bats as reported by Allocati*et*[6] and Muhldorfer[12]. In addition, Muhldorfer[13] states that there are several pathogenic bacteria found in the body of bats that can cause disease in humans and other animals including *Pasteurellasp, Salmonella sp, Escherichia coli* and *Yersinia spp*.

Citrobacterfreundii is an opportunistic bacterium and is also a nosocomial pathogenic bacterium, capable of causing neonatal meningitis among other diseases[14,15,16]. *Escherichia coli*, a pathogenic bacterium, has also been reported in other caves visited by humans, such as Lascaux Cave in France[17], six caves in northern Alabama and northwest Georgia, USA[18], and diverse caves in Mizoram in northeast India[19]. *Klebsiellaoxytoca* is a bacterium that can cause colitis and sepsis, this bacterium also has human defilements (20). *Proteus vulgaris*, generally distributed in soil and water is responsible for approximately 90% of all Proteus infections in humans, especially in the urinary tract. Members of *Providenciasp* are also bacteria commonly found in soil and in water, can cause opportunistic infections in humans, including the urinary tract and eyes, as well as causes of diarrhea, abdominal pain, fever, and vomiting[21]. *Staphylococcus aureus* is one of the bacteria that cause infections in the skin and bacteremia (Sepsis). This bacterium has been reported in *E. Helvum* bats in several regions in Nigeria, Africa[22,23].

The types of bacteria that have never been found before in the body of the bat are *Acinetobactercalcoaceticus, Neisseria sicca, Serratiaribidaca,* and *Aeromonascaviae*. This type of bacteria is very common in humans and some other mammals. *Acinetobactercalcoaceticus* or *Acinetobacterbaumannii* are known as nosocomial pathogens that can cause skin infections in humans. The severe potential caused by *Acinetobacterbaumannii* is bacteremia and pneumonia[24].

Neisseria sicca is a commercial bacterium that is commonly known to be in the upper respiratory tract and is very rarely found to cause meningitis, endocarditis or bacteremia[25,26,27]. In addition, *Neisseria sicca* can cause a decrease in endurance with cutaneous erythematous nodules. This report adds to growing evidence that these bacteria can cause disseminated infections and cutaneous manifestations[28].

CONCLUSION

There are 14 species of bacteria isolated from 4 species of bats. Species of bacteria are *Providencia stuartii, Aeromonas caviae, Citrobacter freundii, Eschericia coli, Serratia ribidaca, Klebsiella oxytoca, Acinotobacter calcoaceticus, Alcaligenes xylosoxidans, Neisseria siccca, Staphylococcus aureus, Providensia penneri, Proteus vulgaris, Citrobacter freundii,* and *Citrobacter aerogenes*.The risk of transmitting the disease to humans or to other animals is quite high. This can be seen from the life cycle of bacteria that involves humans and other animals as hosts and intermediate hosts in completing their life cycles. besides that, some bacteria are also able to cause harm to the body of the bat itself so that it will have an impact on the reduction of the bat population in every habitat.

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Ethical clearance- Taken from Faculty of Education Mathematics and Natural Sciences IKIP Mataram. committee **Conflict of Interest** – None

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The Effectiveness of Health Education on Improving Santris' Knowledge about the Dangers of Scabies at Al Mubtadi'ien Bahrul Ulum Tambak Beras Jombang

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ABSTRACT

Islamic boarding school is one area that has a high incidence of scabies. The poor personal santri hygiene is one of the causes of the spread of scabies. Santris' knowledge needs to be increased to reduce the spread of scabies in Islamic boarding school. The aim of the study is to determine the effectiveness of health education on improving santris' knowledge about the dangers of scabies in Islamic boarding school Al Mubtadi'ien Bahrul Ulum Tambak Beras Jombang. The design of the study is pre-experimental pre-test - post-test control group design. The population was all male students who live in Islamic boarding school Al Mubtadi'ien Bahrul Ulum Jombang Tambak Beras Jombang as many as 60 people, with a sample of 30 people obtained by accidental sampling. The independent variable is health education, while the dependent variable is known. The health promotion methods were used for the health education by using video as the media, while to explore the knowledge about the danger of Scabies, it used the questionnaires that were tested the validity and reliability. The data analysis used Wilcoxon matching pairs. The results obtained before the health education of the danger of scabies, most students have a sufficient category of knowledge as many as 20 people (66.6) and improved to 19 people (63.3%). It is concluded that there is an influence of health education knowledge of students about the dangers of scabies at Islamic boarding school Al Mubtadi'ien Bahrul Ulum Tambak Beras Jombang.

Keywords: *health education, personal hygiene, scabies;*

INTRODUCTION

Scabies is a parasitic skin disease caused by Sarcoptes scabiei, that is characterized by strong local itching and non-specific skin changes patterns[1,2]. The Indonesian Ministry of Health showed that the prevalence of scabies in Indonesia reached 4.6% - 12.95 the % year 2012 and ranked in the third from 12 most common skin diseases. In 1989 and 1990, the prevalence of scabies was 6% and 3.9% (Ministry of Health of the Republic of Indonesia, 2004). The prevalence of adolescents and children for scabies tends to be high at around 6% - 27% of the general population and adolescents (Sungkar, 2005). Of the 10 biggest diseases in Indonesia, Scabies ranks in the third position with the prevalence of 4.60-12.95%.

Islamic boarding school is one of the environments where scabies is often found. Research by Dan Ratna, I., Rusmartini, T., Wiradihardja[3] stated that the incidence of scabies at the Sukahideng Islamic Boarding School in Tasikmalaya Regency is quite high (27.21%). There are various causes of the scabies occurrence underlying the outbreak of the disease in the boarding school. Starting from the low knowledge of the students, students attitudes that tend to not support Clean and Healthy Life Behavior (PHBS), the hygiene issue, and the student's behavior that facilitate the transmission of scabies in the boarding school.

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The preliminary study conducted by researchers at Al Mubtadi'ien boarding school found that the 15 santri is 100% experienced Scabies. The results of interviews with the respondents revealed that they often take turn using towels, lending the towels and other personal items. In addition, they assume that scabies is a natural disease experienced by them and does not become a burden for them. In fact, they are proud if they have experienced it, because of the wrong perception of students. With the scabies disease, religious knowledge has penetrated to the santri. The lack of knowledge of scabies is one of the important backgrounds to take an action. Of various brief information from some of the santri, researchers consider the need for health education to increase the students' knowledge. From the background above, we aim to examine the effectiveness of health education on improving students' knowledge about the dangers of scabies at Islamic boarding school Al Mubtadi'ien Bahrul Ulum Tambak Beras Jombang 2017

MATERIALS AND METHOD

This study is a pre-experimental study pre-test post-test control group design. The population is all male students who live in Islamic boarding school Al Mubtadi'ien Bahrul Ulum Jombang, as many as 60 people, with a sample of 30 people obtained by accidental sampling. The independent variables are health education, while the dependent variable is known. The health promotion methods were used for the health education by using video as the media, while to explore the knowledge about the danger of Scabies, it used the questionnaires that were tested the validity and reliability. The data analysis used Wilcoxon matching pairs.

RESULTS

Table 1. Distribution of frequency based on students' age at Islamic boarding school Al Mubtadi'ien Bahrul Ulum Tambak Beras Jombang 2017

Age (Year)	F	%
Early adolescents (10-15)	22	73,3
Mid adolescent (16-20)	8	26,7
TOTAL	30	100

Table 1 shows that most students are in the category of early adolescents (10-15 years) of 22 people (73.3).

Tabel 2. Distribution of frequency of knowledge of students before being given health education the Dangers of Scabies at Islamic boarding school Al Mubtadi'ien Bahrul Ulum Tambak Beras Jombang 2017

Category	F	%
Good	6	20
Fair	20	66,7
Poor	4	13,3
TOTAL	30	100

Table 2 shows that before the health education most students had sufficient knowledge about the dangers of scabies, as many as 20 people (66.6).

Table 3. Distribution of frequency of knowledge of students after being given health education the Dangers of Scabies at Islamic boarding school Al Mubtadi'ien Bahrul Ulum Tambak Beras Jombang 2017.

Category	F	%
Good	19	63,3
Fair	11	36,7
TOTAL	30	100

Table 3 shows that after the health education most students have good knowledge about the dangers of Scabies, as many as 19 people (63.3%).

Table 4. Distribution of frequency of knowledge of students before and after being given health education the Dangers of Scabies at Islamic boarding school Al Mubtadi'ien Bahrul Ulum Tambak Beras Jombang 2017

		N	Mean Rank	Sum of Ranks
Last Knowledge – Early knowledge	Negative Ranks	1[a]	7.00	7.00
	Positive Ranks	14[b]	8.07	113.00
	Ties	15[c]		
	Total	30		

Table 5. Results test of wilcoxon test the Dangers of Scabies at Islamic boarding school Al Mubtadi'ien Bahrul Ulum Tambak Beras Jombang 2017

	Last Knowledge – Early knowledge
Z	-3.260[a]
Asymp. Sig. (2-tailed)	.001

There is an influence of health education on the knowledge of students about the dangers of scabies at Islamic boarding school Al Mubtadi'ien Bahrul Ulum Tambak Beras Jombang (p value 0.001).

DISCUSSION

Before the health education, most of the santri were fairly knowledgeable and few were still lack of knowledge about the dangers of scabies. This data shows that students' understanding of the dangers of scabies is still in below category. After given the health education, there was an increase in knowledge, from most were fairly knowledgeable to be well-informed. From these data, it can be explained that there is an improvement in the knowledge of students about the dangers of scabies.

The fair and poor knowledge of santri regarding scabies is influenced by many factors. One of them is the age factor. Most of the students who experienced scabies are in the category of early adolescents, 10-15 years old (the sample is students between 0-6 years old who live in the Islamic boarding school). Accordingly, Muhammad Zayyid, Saidatul Saadah, Adil, Rohela, & Jamaiah[4] stated that 31% of the prevalence of scabies in Penang, Malaysia is children aged 10-12 years. Early adolescence is a transition stage from childhood to adulthood. At this stage, it is the initial stage of the students to enter the Islamic boarding school that is assumed by the researchers as a beginning to adapt and finds close friends. In order to get the recognition and effort to find friends, it is possible to begin the interaction by "feeling the same", away from the family and starting to feel a sense of cooperation among students.

Santri knowledge is related to age factors. The younger a person is, the harder it will be to understand information. Scabies incident that happened to students in Islamic boarding school Al Mubtadi'ien was also due to the lack of students' ability to understand or perhaps had never heard of scabies, and may not have had experienced scabies before. The new experience of living inside the boarding school may also be one of the factors of ignorance of the disease. Mubarak (2008) stated that age is one of the factors that influence the acceptance of knowledge and attitude. In line with Wawan, A and Dewi (2010), the more efficient an individual's age, the level of maturity and strength of a person will be more mature in thinking and working. The knowledge of santri increased with the existence of health education about scabies. This health education opens and adds knowledge and helps students to maintain personal hygiene better while staying in the boarding school. Even though it is still regarded at a young age, it is hoped that students will be able to receive, digest and understand scabies.

The The use of media that involves many senses will be more able to provide additional knowledge than those that involve a few media. Knowledge is obtained through the sense of hearing and sight. If the senses of sight and hearing are involved, then the message given will be better received than by only involving one sense.

The opinion is based on the essence what is expected in a health education is to form a better santri behavior. Santris who have less knowledge about scabies will also have a poor understanding of how the parasite scabies spread, one of which is strongly influenced by the personal hygiene of the santris themselves. The lack of understanding emerges unsupportive attitudes and even the apathetic tendency of maintaining personal hygiene so that eventually exposed to scabies. Students who have experienced scabies must take a treatment for themselves, and the treatment should be carried out to all the Islamic boarding school residents through the role of the health center. Fuller stated that santri who have poor knowledge about the disease, a long incubation period, and difficulties in treating scabies will have an impact on prolonged scabies[5]. So it is true that the knowledge is related to scabies in santri. Accordingly, Dan Ratna, I., Rusmartini, T., Wiradihardja[3] who conducted research at Pondok Sukahideng, Tasikmalaya Regency, stated that knowledge is related to scabies incidents. The health education about scabies was given to all male students. However, both male and female can experience scabies. Chosidow[8] stated that male, female, all ages, ethnic groups, and various socioeconomic levels have the potential to experience scabies if they live in unhealthy communities.

Scabies is becoming a trend disease among Islamic boarding schools, where there is a mixture of santris behavior and habits that cannot be underestimated. The lack of parents supervision while studying at Islamic boarding schools to always maintain personal hygiene, enrich scabies in that schools. Scabies is an infectious disease that is often experienced by a group of people whose personal hygiene is not maintained. Terry et al[8] conducted a study of rural areas in Thailand or a camp of homeless children in Sierra Leone about scabies and stated that scabies often attacks poorly clean institutions that take care of the children. It is also revealed by Koene et al.[9]; that staffs, employees or children who are and live in the community, will experience scabies. Agoes R, Oehadian[10] stated that this disease is commonly found in children and adults who have poor hygiene, rarely bathing and changing dirty clothes, often exchanging clothes, and rarely washing bed linen. Most cases are experienced by students who live in dormitories, Islamic boarding schools, orphanages, etc.

Afriani[11] found a significant correlation between the incidence of scabies and poor bathing practices, the practice of maintaining hand and nail hygiene, the practice of maintaining the cleanliness of clothes and towels, the practice of exchanging clothes and towels, and the practice of maintaining the cleanliness of beds. Azizah[12] in her study at the Al-Hamdulillah Islamic boarding school in Rembang also agreed that the frequency of bathing and shampooing, the soap sharing with other students, exchanging clothes with friends and staying in the boarding school for long periods of time relates to the incident scabies.

The result of health education is the establishment of good knowledge. Good knowledge usually has an impact on good attitude in addressing the transmission of scabies and is expected to force good behavior of students as well as starting to care about personal hygiene and avoid unhealthy behavior that will harm the santri themselves. First, the student must have a good understanding of personal hygiene which is the main key to scabies transmission. A poor understanding, less supportive attitude or even careless about the transmission of scabies will make it difficult for other students who are trying to free themselves from the scabies disease. Termination of the chain of transmission begins with the knowledge justification, changes in attitude and finally the behaviors establishment that is far from the risk of disease. Attitude is the basis for the establishment of santri acts[13-15]

CONCLUSION

Health education is effective in increasing the knowledge of male students about the dangers of scabies at Islamic boarding school Al Mubtadi'ien Bahrul Ulum Tambak Beras Jombang. It is suggested for further researchers to include determinants of scabies disease and health education for the owners of Islamic boarding schools

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New Approach for Referral Preparation to the Health Care Center in Denpasar City and Bogor Regency

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ABSTRACT

Knowledge, attitudes and skills of pregnant women to recognize danger signs during pregnancy to postpartum period and newborn baby is a strategic effort to prevent maternal and infant mortality. The aim of the study was to find out the results of guidance interventions for pregnant women and husbands using video media, pictorial fans with five finger signs, pocket books and maternal and child health books between before and after guidance at three Health Centers in Denpasar City and Bogor Regency. The study design was quasi-experimental with nonrandomized pretest-posttest with control group design. The research subjects were 204 pregnant women in the three intervention groups who had fulfill inclusion and exclusion criteria. The intervention group on the subject was divided into interventions 1 (video media, fans with five finger signs and and maternal and child health books). Group intervention 2 (pocket books, fans with five finger signs and maternal and child health books) and control groups (maternal and child health books). The instrument used was a questionnaire containing the socio demographic characteristics of the subject, knowledge, attitude and observation of skills. The results showed that there were differences in the scores of knowledge, attitudes and skills in the intervention among groups 1 and 2 ($p < 0.05$). The multivariate test results showed that there were four variables that consistently affected the skills score of pregnant women significantly including guidance intervention, maternal occupation, income and residence ($p < 0.005$). It is necessary to consider the awareness of midwives at the health center to innovate in order to increase alertness and early detection through family-based empowerment.

Keywords: *danger signs guidance, pregnancy, health center, empowerment*

INTRODUCTION

According to estimates from world health organizations or the World Health Organization (WHO), as many as 358,000 maternal deaths occur every year (WHO,1 and as many as 88-89% of these deaths can be avoided. The attitudes of health workers (especially midwives and doctors), besides motivation, knowledge and practice are other factors that influence the dynamics of the need for services that forming an important basis for improving maternal and infant health[2,3]. The maternal mortality rate (MMR) in Indonesia according to data from the Indonesian Demographic and Health Survey (IDHS) in 2012 was 359 per 100,000 live births. The MMR is much higher compared to the 2007 IDHS results of 228 per 100,000 live births.

Maternal and newborn health conditions still need serious attention from various parties, not only in Java, but also in Bali. Thus, basic efforts are carried out by midwives in order to prevent death and illness in mothers and children through efforts to increase the knowledge and awareness of pregnant women and families regarding danger signs to mothers and infants. This effort has a large impact to prevent late referrals, especially the delay in recognizing problems that generally cause delays in making decisions and referring to health facilities[4].

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Maternal mortality rate in Denpasar City fluctuating quite significantly, up to 2014 MMR had been reduced to 16.1 per 100,000 live birth but increased back in 2015 and 2016. Maternal mortality rates in the Denpasar City in 2016 (54 per 100,000 live birth) still lower than the target of the Denpasar City Health Office Strategic Plan in 2016 (100 per 100,000 KH). During 2016 in Denpasar City there were 7 maternal deaths consisting of 5 deaths of pregnant women and 2 during delivery. All mothers die in health facilities (hospitals). Four maternal deaths in Denpasar City are caused by Non Obstetric Disease, namely 2 people due to heart disorders, 2 people with dengue syock syndrome.

The main objective of this research is to compare the skills of pregnant women and their husbands / families regarding danger signs to pregnant women and infants to prevent delays in obtaining appropriate care between before and after guidance. In this study, personal guidance methods were used in the two intervention groups and one control group. Guidance media is using videos, fans with five fingers on the left and right hand regarding danger signs picture, pocket books and maternal and child health books.

We need to know the most appropriate approach to increase knowledge, attitudes and skills of pregnant women and families to prevent delays in recognizing problems and seeking help.

MATERIALS AND METHOD

The study design was quasi-experimental, pretest-posttest control group design. Respondents were divided into two groups, namely the control group and the treatment group (1 and 2). The control group (pregnant women in South Denpasar II and Ciomas) were given guidance according to the MCH books at the health center or Puskesmas. Intervention group 1 (Puskesmas I Denpasar Timur and Ciri Mekar) were given guidance using video media, fans with five fingers on the left and right hand regarding danger signs picture and maternal and child health/MCH books. Intervention group 2 (Puskesmas II Denpasar Barat and Sukaraja). given guidance using pocket books and fans and MCH books. The sample size in the control and treatment groups will be calculated according to the population of second trimester to third trimester of pregnant women in selected health centers in Denpasar City and Bogor Regency, which amounted to 34 pregnant women in each selected health center or 204 pregnant women in health center. Conducted pretest and posttest for pregnant women regarding danger signs for pregnant women and newborns. Data collection is carried out for three months (July to September 2017).

Pregnant women and husbands who were involved in intervention groups 1 and 2 were given a pretest before guidance. In the control group, pregnant women were given a pretest and were then asked to read maternal and child health books regarding danger signs and preparation for referrals. The time taken from the pretest to posttest is one month. Guidance in the intervention group and the control group was carried out after the pretest 3 meetings for one hour at each meeting. Guidance is carried out by the MCH management midwives who have been trained in the selected health care.

Data analysis was univariate, bivariate and multivariate analysis. Univariate analysis by calculating the mean. Bivariate analysis to analyze the relationship between independent variables and dependent variables, the intermediate variable with the dependent variable using paired t test and chi square analysis. Multivariate analysis to analyze the relationship between all research variables using multiple regression tests and modeling.

RESULTS

The homogeneity test shows if the respondent characteristics are generally homogeneous ($p > 0.05$). There were differences in the pretest and posttest scores in the intervention group on the score of knowledge, attitudes and skills ($p < 0.05$) except in the control group did not show differences in the skill score ($p > 0.05$). The results showed that if intervention 2 had a significant difference in knowledge, attitudes, and skills scores when compared with intervention group 1 and control group. In the table 1 below, the results of differences in pretest and posttest scores were displayed on the knowledge, attitudes and skills of pregnant women.

Table 1. Differences in Pretest and Posttest Scores between Intervention and Control Groups (n=204 pregnant women)

		adjusted variance	*z*	***p-value***
Knowledge	Intervention group			
	1	24650.75	2.357	**0.18**
	2	24528.00	4.431	**0.000**
	Control	25068.00	2.239	**0.025**
Attitude	Intervention group			
	1	26258.38	1.858	0.063
	2	26451.13	3.034	**0.002**
	Control	25909.38	1.948	0.051
Skill	Intervention group			
	1	26757.13	7.070	**0.000**
	2	26746.63	7.145	**0.000**
	Control	26755.13	1.284	0.199

Source : **Primary data analysis (2017)**

The multivariate test results using general linear model (GLM) analysis showed that there was no significant relationship in the intervention group and maternal age with a knowledge score (p> 0.05). There was no significant relationship between intervention and maternal occupational factors with attitude scores (p> 0.05). Consistently intervention, maternal occupation, income and place of residence were significantly associated with maternal skills scores regarding danger signs for mothers and newborns baby and neonates (p <0.05). The table 2 below shows the results of the analysis between the intervention, the work of the mother, income and place of residence with the skill score.

Table 2. Results of General Linear Model Analysis between Independent Variable, Intermediate and Skill (n=204 pregnant women) in 2017

	Skills				
	coeff	**z**	**p**	**95% CI**	**AIC**
Intervention group 1 2	 7.198 14.083	 3.52 8.61	 **0.000** **0.000**	 10.875 -17.291	7.275
Mother occupation	4.356	2.98	**0.003**	1.494 -7.219	
Family income	-7.746	-4.20	**0.000**	-11.365 -4.127	
Residence	-8.217	-3.19	**0.001**	-13.263 -3.171	
Husband education: Middle High	 1.783 1.719	 1.27 0.76	 0.204 0.446	 -0.967 – 4.532 -2.704 – 6.142	
Health assurance	-1.166	-0.88	0.380	-3.769 – 1.436	
Age	1.200	0.79	0.430	-1.778 – 4.179	
Husband occupation	-1.376	-0.36	0.721	-8.919 – 6.166	
Constanta	13.773	3.65	0.000	6.371 -21.175	

Source : Primary data analysis (2017)

DISCUSSIONS

In general the characteristics between the intervention groups were not different (p> 0.05). Differences were found from the characteristics of income or socio-economic level, residence, and means of transportation used by subjects to health facilities (p <0.05). The sociodemographic characteristics of the subject can affect service quality as measured by knowledge, attitudes and skills the subject knows and manages the problems faced.

According to the World Health Organization[1], there are several determinants that influence client visits to health facilities, especially to obtain reproductive health services, including: financing factors or ability to pay, distance factors to health facilities, client knowledge, education level and social status economy. Agreeing with the results of a study in Ethiopia by Tesfahun, Worku, Mazengiya, Kifle[5], that maternal health care utilization is influenced by accessibility factors, socio-cultural beliefs, individual attitudes and health seeking behavior.

There were differences in the pretest scores of knowledge, attitudes and skills between the intervention group 1 and 2 and the control group significantly (p <0.05), although the results showed that the most significant difference was in the intervention group 2. The skill score showed that only the control group who did not show a significant difference (p> 0.05) when compared with intervention group 1 and 2. This was caused by factors of resistance or design invalidity, including: the interaction of the given test, the interaction of the results of the selection with the results and the existence selection with the results and the existence selection bias[6].

The selection bias in terms of the invalidity of interaction factors from the intended test is that there is a weakness of the video media in the intervention group 1 due to the availability of a video watching device at home that is not shared by all subjects in the group, in addition to the obstacles that explain content or content of the video. Another problem with invalidity is that the characteristics of the subject from the beginning have been different, especially in the intervention group two which shows if the initial results of the pretest are much higher than the other groups[6].

There was no significant difference between the pretest and posttest scores according to the characteristics of the transportation facilities and the distance to the health facilities with scores of knowledge, attitudes and skills (p> 0.05). Knowledge, attitudes and skills of individuals or subjects are influenced by socio-economic factors, values that are believed, and intention to behave. Different results were obtained by Tesfahun, Worku, Mazengiya, Kifle[5], that the factors that influence the utilization of postpartum care are: time constraints, transportation costs, shelter, distance from home to health facilities, previous ANC history and ability health workers provide solutions to problems faced.

The results of multivariate tests using GLM were obtained if there was only a very significant relationship between intervention, maternal work, family income, and place of residence with a skill score (p <0.05). The results of the study by Amenu, Mulaw, Seyoum & Bayu[7] and Salam, Lassi, Das and Bhutta[8] that positive health behaviors are influenced by various factors, including: complex phenomena related to availability, quality, service financing, structure social, health beliefs and characteristics of clients or service users[9] .The success of communication between midwives and clients or pregnant women greatly influences patient / client satisfaction, increases understanding, increases mutual trust and increases the ability of pregnant women and families in decision making[10]. Mother's knowledge is not directly affected by the number of ANC visits due to differences or gaps between the ability of officers / midwives and the limited information provided by midwives regarding danger signs to mothers during pregnancy to postpartum, newborn baby and neonates[11-15]. The husband's education contributes to the participation of husbands in delivering mothers to health facilities and helping to make decisions more precisely and quickly[16].

CONCLUSION

The use of media and interesting information delivery techniques are determinants of the success of training. It is necessary to consider the characteristics of the research subjects, such as the availability of VCD devices, other communication media in the form of mobile phones for intervention groups that receive training using video media.

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Product Quality of the Local Fried Onion in Palu City, Indonesia

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ABSTRACT

Unsafe food threatens global health and puts everybody at risk. Fried Onion is a home industry product in Palu City, Indonesia. Due to its popularity, it is distributed cross the country and overseas. The main material of fried onion is raw onion which can easily be contaminated by biological, physical and chemical contaminants. This study is a descriptive observational study to examine the implementation of Good Manufacturing Practices and Hazard Analysis Critical Control Point (HACCP) at one of famous fried onion home industries in Palu City using a observational descriptive study. The GMP assessment was conducted by using a Self-Assessment Questionnaire on good manufacturing practices by Food Supplement Europe. The study found that eventhough the observed home industry has implemented the GMP, it still needs improvements in terms of transportation and distribution aspects. It is also found that the Critical Control Points of this industry are in the stages of washing the onion, frying stage I and drying the onion.

***Keywords**: Fried Onion, Traditional Food, GMP, HCCP.*

INTRODUCTION

Food safety is an integrated process to ensure food safety related to both healthy and safe techniques for preventing infection and contamination in the food production chain, and helping to ensure the quality and healthy food maintenance for health improvement[1,2]. Unsafe food can pose health problems both in local and global scope[3].

GMP is a quality assurance to ensure that products are manufactured and controlled consistently based on proper quality standards as required by the marketing authorization. GMP is broadly categorized into two groups: cross contamination/mix-ups and fake labeling[3]

HACCP is a system designed to ensure that manufactured products are safe for consumption and can prevent food product quality from any problem or hazards. HACCP will be able to identify critical control points (CCPs) in production systems that can potentially reduce product quality[4]. Red onion has huge use and benefit, however red onions can also potentially harm the body due to microbiological contamination including Shigella spp, Bacillius cereus, and Salmonella[5,6]

Palu City is well-known with its fried onion products which are usualy as a gift for visitors. The most famous fried onion in the city is UD X fried onion. Therefore, the product of UD can reach across the nation and other countries.The researchers conducted GMP and HACCP analysis on fried onion products in UD X to ensure that the fried onion products marketed are safe for consumption.

MATERIALS AND METHOD

This research is an observational descriptive study. It aims to examine the implementation of GMP and HACCP on UD X fried onion in Palu City, Indonesia. The sample of this research was UD X fried onions. The study observed all production steps based on

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the scope aspects of GMP and HACCP. The GMP assessment used a "Self-Assessment Questionnaire on Good Manufacturing Practice" questionnaire published by Food Supplements Europe and was assessed based on the gutman scale. The research setting was in UD X because UD X is the largest fried onion industry and the first home industry introducing the fried onion business typical in Palu City. UD X has been able to produce 300 kg fried onions per day, located strategically and very close to the airport, making UD X very famous and easily accessible by tourists who come or go outside the Palu City.

RESULTS

UD X is one of trading businesses classified as a cottage industry in the Palu City with its main and very famous product is fried onion. UD X also produces many products including *abon ikan* (made from sea fish)*, abon ayam* (made from chicken) and *abon sapi* (made from beef). All of these products are sold directly at UD X's stores located in South Palu

Product description that will be made for GMP and HACCP planning only focuses on fried onion products, as presented in table 1.

Table 1: Product Description and Its Usage

PRODUCT DESCRIPTION	
Company Name	**UD X**
Characteristic Summary	
Product Description	**Organoleptic Characteristic:** Texture/Physical: Solid Colour: Golden Brown Fragrant: Typical Onion Aroma Taste: Savory
Composition	Red Onions (*Allium ascolinicum L.*), Starch Flour, Maizena Flour, Salt, Cooking Oil, Water
Processing Unit Capacity	300 kg/day
Usage Requirements	Products are placed in the cool place and avoid from direct sunlight
Transport/Packaging Condition	Products are Packaged by Plastic having *Zipper Lock*
Product Usage	
Fried Onion Product can be consumed by public, without any restrictions for the ages.	
Place of Sales	UD X Shop
Rule of Law	Business Act

Table 2: GMP Anayisis

GMP Indicators	**The number of Questions**	**The number of Answers "Yes"**	**GMP Score**
Primary Production			
Production Process	57	53	53/57x100% = 0.92 =92%
Recovery and Rework	11	11	11/11x100% =1 =100%
Food Product and Development Process	9	9	9/9x100% =1 =100%
Design and Facility			
Room and Equipment Place	53	41	41/53x100% =0.77 =77%
Operation Control			
Management Quality	17	15	15/17x100% =0.88 =88%
HACCP	6	0	0/6x100% =0 =0%
Laboratory testing	10	2	2/10x100% =0.2 =20%
Documentation	22	21	21/22x100% =0.95 =95%
Maintainance and Sanitation			
Storage	18	16	16/18x100% =0.88 =88%

Cont... **Table 2: GMP Anayisis**

Personal Hygiene			
Personal Inspection (self-check up)	4	4	4/4x100% = 1 =100%
Transportation			
Transport ans Distribution	15	5	5/15x100% =0.33 =33%
Stability and Storage Age	15	7	7/15x100%= 0.46 =46%
Product Information and Customer Awarness			
Complaint Procedures, Product or Food Withdrawals and Emergency Procedures	15	9	9/15x100% =0.6 =60%
Training			
Personnel dan Training	23	17	17/23x100% =0.73 =73%
Sub Contract Operations (Cooperation Contract as Partner)	11	0	0/11x100%= 0 =0%
GMP UD X Results	**286**	**211**	**211/286x100% =0.73 =73%**

GMP analysis on UD X in table 2 shows that UD X has applied GMP based on all indicators of GMP implementation, namely 1.1, 1.2, 1.3, 2.1, 3.1, 3.4, 4.1 and 5.1 . This can be seen from the score obtained ≥75%. Other indicators also show that UD X has applied GMP to its business units, which can be seen from indicators 7.1 and 8.1 with a score of <75%. The final result shows that UD X has adequately implemented GMP in its business unit.

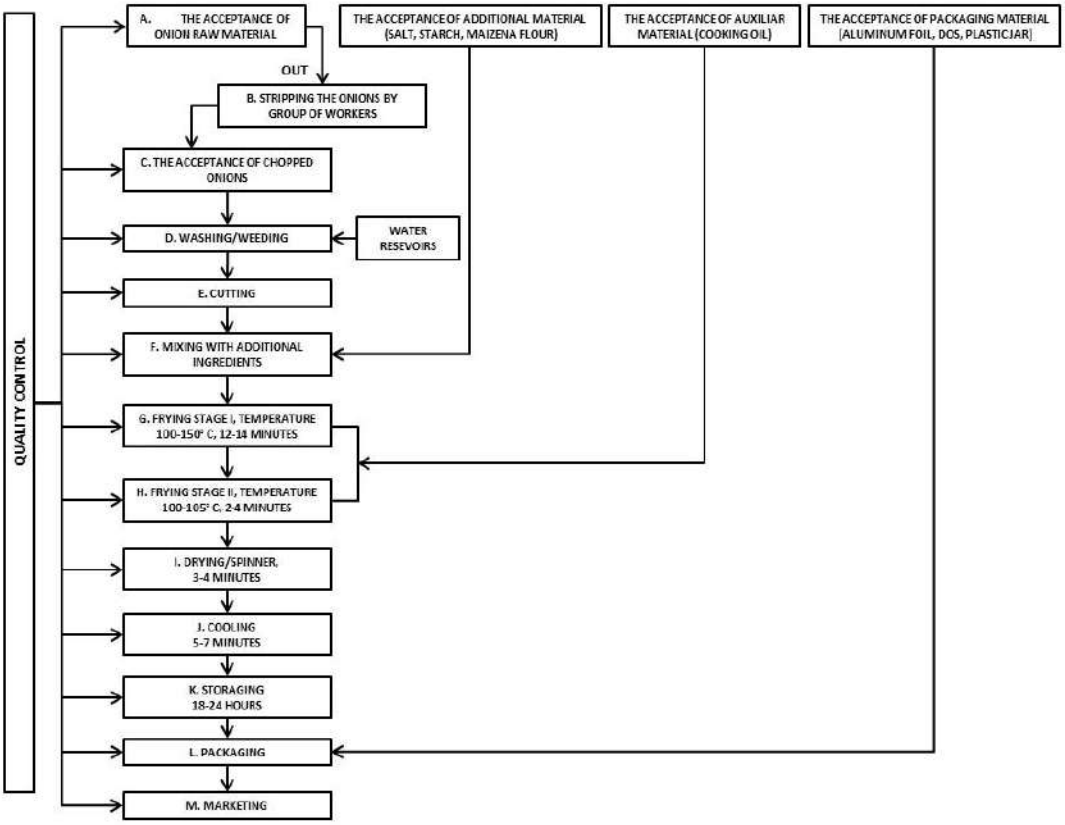

Chart 1 Flow of Fried Onion UD X Processing Process Table 3 shows that from 11 assessment stages, IR obtained is at the lower risk level (4 ≥ IR ≤ 8), increased risk (8 ≥ IR ≤ 12), satisfactory risk (IR ≤ 4) and critical risk (12 ≥ IR ≤ 16).Table 4 shows that the washing stage, frying stage I, and draining stage are CCP. The washing stage needs 5 minutes as CCP. The temperature of 180 ° C for 2-4 minutes becomes an important aspect to reduce the risk. Lastly, the speed of rotation (650 rpm) and time of the spinner machine (10 minutes) is an important aspect to eliminate the risk.

Tabel 3: Hazard Analysis and Identification of CCPs

Process	**Hazard(Biology (B)/ Physics (P)/ Chemistry(C))**	**Hazard Sources**	**Potential Hazard**			**Preventive measure**	**Decision Tree**				**CCP / Not CCP**
			Chance	Severity	IR		Q1	Q2	Q3	Q4	
Raw Material Acceptance	B: *Shigella Spp*, *Bacillius Cereus*, *and Salmonella, E.Coli* C: -	The soil attached to the onion	4	4	*CR*		N				
	P: Soil	The soil attached to the onion	1	1	*SR*	cleaning the onion from attached soil from harvest	Y	N	Y	Y	Not CCP
Stripping onions	B : *Shigella Spp*, *Bacillius Cereus*, *and Salmonella, E.Coli* C: -	Knife and Human	3	4	*IR*	Cleaning of working equipments, reducing the soil attached on the onion by waving the onion roots in the ground, Personal hygiene	Y	N	Y	Y	Not CCP
	P: Soil	The soil attached to the onion	1	1	*SR*	The soil attached to the skin is set aside	Y	N	Y	Y	Not CCP
Onion Washing	B : *E. coli, Salmonella, Shigella Spp*,dan *Bacillius Cereus* C: -	Water and Human	3	4	*IR*	Checking water quality Regularly using running water.	Y	N	Y	Y	Not CCP
	P : Soil	The soil attached to the onion	1	1	*SR*	Cleaning is conducted until no longer soil attached in the onions.	Y	Y			CCP
Cutting	B: *E. coli, Salmonella, Shigella Spp*,dan *Bacillius Cereus*, hepatitis A, norovirus, rotavirus, other viral agents C: -	Cutting Knives and Human	3	4	*IR*	Cleaning of working equipments, Checking tools used regularly and personal hygiene	Y	N	Y	Y	Not CCP
Additional material Mixing	B: *E. coli, Salmonella, Shigella Spp*,dan *Bacillius Cereus*, hepatitis A, norovirus, rotavirus, other viral agents C: -	Starch Flour and Human	3	4	*IR*	Personal hygiene	Y	N	Y	Y	Not CCP
Frying Stage I	B: *E. coli, Salmonella, Shigella Spp*,dan *Bacillius Cereus* hepatitis A, norovirus, rotavirus, other viral agents	Frying Tools and Human	1	1	*SR*	Keep the oil temperature from falling	Y	Y			CCP
	C : Trans fatty acids	Cooking Oil	4	4	*CR*	Oil is replaced when it has turned blackish brown	Y	N	Y	Y	Not CCP
Frying Stage II	C: Trans fatty acids	Cooking Oil in the onions	4	4	*CR*	Oil screening is conducted by placing fried onions on this second stage on oil-absorbing xpaper.	Y	N	Y	Y	Not CCP
Draining	C : Trans fatty acids	*Spinner*	1	1	*SR*	Drying / draining is conducted for 3-4 minutes.	Y	Y	Y		CCP
Cooling	B: E.Coli, Salmonella spp, shigella spp, hepatitis A, norovirus, rotavirus, other viral agents	Human and oil-absorbing paper.	2	4	*SR*	Personal Hygiene,	Y	N	N		Not CCP

Cont... **Tabel 3: Hazard Analysis and Identification of CCPs**

	B: Ans, Insects	Oil-absorbing paper	3	1	*SR*	Visual observation	Y	N	N		Not CCP
	P: Ash	Oil-absorbing paper	2	1	*SR*	Oil-absorbing paper is in clean condition before it is used	Y	N	N		Not CCP
Storage	B: E.Coli, Salmonella spp, shigella spp, hepatitis A, norovirus, rotavirus, other viral agents	Human	1	4	*SR*	Personal Hygiene	Y	N	N		Not CCP
	B: Ans, Insects	Oil-absorbing paper and plastic container	3	1	*SR*	Visual observation	Y	N	N		Not CCP
Packaging	B: E. Coli, Salmonella spp, shigella spp, hepatitis A, norovirus, rotavirus, other viral agent	Human	1	4	*SR*	Personal Hygiene	Y	N	N		Not CCP

*CR: Critical Risk; SR: Satisfactory Risk; IR: Increased Risk

Tabel 4: HACCP Plan Data Sheet

STEP/ CCP Principle 2	***Hazards (B/C/P) Principle 1***	***Parameter of CCP***	***Critical Limit Principle 3***	***Target Value***	***Monitoring Principle 4***	***Corrective Action Principle 5***
Cleaning	P: Soil	Time	Cleaning within 4-5 minutes	5 minutes	What: Physical hazards in the form of land How : Wash the onions until the ground is invisible When: After the onion stripping process Who: The worker on duty	Rewashing if the soil is still visible
Frying Stage I	B: *E. coli, Salmonella, Shigella Spp*,dan *Bacillius Cereus* hepatitis A, norovirus, rotavirus, other viral agents	Temperature and time	100°C-105°C with a time range of 14-18 minutes	180 °C with a long frying for 2-4 minutes	What : Biological Hazards How : Recording temperature and time When : After Frying Process Stage I Who : Workers on duty	Refrying in the frying stage II
Draining	C : Trans fatty acid	Round Speed and Spinner Machine time	Draining the onions about 3-4 minutes by using s*pinner*	Using *spinner in the speed of* 650 rpm within 10 minutes	What: Chemical hazards are trans fatty acids How: Measure speed and time When: After the stage II onion cooking process Who : Workers on duty	Redraining if it still looks wet

DISCUSSION

The score of ≤46% in point 6 (transportation) indicated low quality of transportation process particularly in cleanliness of vehicles, vehicle check up, and separation of contaminated material and sterile material. Finished food (packed food) should be separated with raw material that can potentially contaminate the final food[7].

UD X also does not implement GMP on indicator 3.2 (HACCP), 3.3 (laboratory testing) to 8.2 (sub-contract operation) with a score of ≤20%. The indicator was not achieved because UD X has HACCP system and laboratory. Laboratory testing on food production is important to detect microbial contaminants[8].

Although UD X has not applied HACCP officially, there are some points that can eliminate the risk. Identification starts from the initial stage, the handling of the raw materials, stage 2 onion stripping, stage 3 onion washing, stage 4 onion cutting, stage 5 mixing additional ingredients, stage 6 frying I, stage 7 frying II, stage 8 draining, stage 9 cooling, stage 10 storage, and stage last packing.

From all the steps, there are microbiological hazards such as E. coli, Salmonella, Shigella spp, Bacillus cereus, hepatitis A, norovirus, and rotavirus. However, those bacteria can not live in such high temperature from 100 to 105°C for 12-14 minutes at the frying stage I [9]. The E. coli bacteria are likely to appear from the contaminated soil, contaminated water, and hand contamination[10].

Physical hazards such as soil and dust also appear in raw materials, stripping onions, washing onions, and the cooling stage. To prevent this problem, the soil and dust must be separate from the onion and other material by washing properly.

In addition, chemical hazards can appear from oil in the frying stage I, frying stage II and the stage of draining in the form of trans fatty acids. Cooking oil used by the company is utilized repeatedly with high temperatures so that it can damage the quality of the product[11]. Repetition of frying at high temperatures will affect the chemical quality and organoleptic of cooking oil (E and D, 2007). Thus, cooking oil can be reduced by drying onions. Draining with a spinner will separate oil from the fried onion[12].

From the 11 stages, based on the determination of IR, 3 stages are the most dangerous stages including receiving raw materials, frying stage I and frying stage II. The chances of contamination at these stages are very high due to lack of hygiene, which raises microbiological, physical and chemical hazards.

There are 3 CCP namely the onion washing stage, the frying stage I and the draining stage. The washing duration, 4-5 minutes, is a crusial aspect to eliminate the physical hazards. However, washing time also must not be too long to keep nutrition substances[13]. The frying stage I was a CCP because high temperature can eleminate biological hazards.The parameters used are temperature and frying time of 100-105°C for 14-18 minutes. The temperature and time must be control to ensure onion not overcook. The cooking oil also must be control regularly[14,15].

The draining stage can remove or reduce chemical hazards,cooking oil, from the frying stage I and II. The critical limit at this stage is the scouring of onions for 3-4 minutes using a spinner. The target value that can still be consumed according to[16] is by drying/draining onions using a spinner with a speed of 650 rpm for 10 minutes.

CONCLUSION

Overall, UD X has applied GMP. However, there are some issues related to transportation and distribution of the products. This study has also identified the Critical Control Point of the industry that is in the washing stage of onions, frying stage I and draining stage. The application of GMP and HACCP is important to ensure good quality of fried onion products in the home industry.

Ethical Clearance- Taken from Public Health Faculty, Tadulako University committee

Source of Funding- Public Health Faculty, Tadulako University

Conflict of Interest – None

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Economic Burden of Cancer Patients at Hasanuddin University Teaching Hospital, Makassar : A Qualitative Study.

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ABSTRACT

Introduction: Cancer can cause disasters, economic-social consequences for individuals and household sufferers. This study reveals the phenomena experienced by cancer patients to inform the development of patient-centered policies. This paper provides a qualitative understanding of the economic and social consequences of cancer.

Method : Interviews were conducted on patients who conducted examinations and referrals at Hasanuddin University Teaching Hospital, Makassar (n=30). Data interpretation uses content analysis.

Results: The affordability of medical treatment and care needed to manage disease is identified as a key aspect of economic difficulties, which endangers the capacity of patients to proactively manage their illnesses and reduce risk. Factors that exacerbate difficulties are mainly not covered by the National Health Insurance scheme (JKN), and other government benefits. Economic burden are not only felt for those who do not have JKN and other government benefits, but also those who receive insufficient subsidies to meet the costs of managing their long-term illness over and above necessary daily living expenses.

Conclusion: This study provides insight into the economic burden of handling cancer, which shows that economic difficulties require households to make difficult decisions between medical expenses and basic living expenses.

Keywords: *Economic burden, cancer patient, social consequences*

INTRODUCTION

Cancer is a catastrophic disease with characteristics that require high costs and a large number of sufferers and diseases that are at risk of death. Cancer is the leading cause of death worldwide in both developed and developing countries. However, the burden of cancer is more prominent in developing countries1. Lung, liver, stomach, colorectal, and breast cancer are the biggest causes of cancer deaths every year2. When a person is diagnosed with cancer and must be hospitalized in the hospital, the financial consequences are a burden that must be borne by the patient3. In Indonesia, the prevalence of cancer patients in 2013 was known to be 1.4 cases per 1000 inhabitants. Nearly 50% of them occur in populations aged> 75 years4.

Research findings from The Action Study Group show that out of 9,513 patients who were followed up in the 12th month, nearly 50% of cancer patients experienced bankruptcy, while 29% experienced death. In addition, almost half or 44% of survivors will experience economic difficulties caused by cancer, so use future savings5.

The average cost for treatment of breast cancer can reach $ 15,000 or around Rp 207,569,923 per year. Patients with an income of $ 1,100 (or around Rp.

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15.221 795) or lower per month will have difficulty paying for their treatment. With a 2014 per capita average GDP (Gross Domestic Product) of $ 3,553.75 or around Rp.49,176,775 for the eight countries involved, almost all cancer sufferers must use their savings and experience bankruptcy while maintaining their quality of life. Bankruptcy or Financial Catastrophe is defined by spending as much as 30% or more of the household's main income and pocket money on cancer treatment costs 5,6.

There are many things that are not yet known about unpredictable costs for health services needed by cancer patients for example young age, low income, living opportunities, and other supporting services that are supportive7. So that it greatly affects the family economic burden of cancer patients. Based on data from the Basic Health Research (Riskesda) in 2013 in Eastern Indonesia, South Sulawesi Province was the province with the highest number of cancers, namely 1.7 1,7 or around 14,119 people8. Based on observations and preliminary surveys researchers in cancer patients originating from Eastern Indonesia in general will be referred to the Hasanuddin University Makassar Hospital.

MATERIALS AND METHOD

The informants in this study were around 30 people who were related to the economic burden of cancer patients at RSUP Unhas, Makassar. Ethical approval was given by the Health Research Ethics Committee of Hasanuddin University. All informants gave informed consent before the interview was conducted. The interview began by asking: "what does it feel like to live with cancer now," followed by questions about the challenging and useful aspects of their experience. All interviews are recorded electronically and transcribed word for word. Qualitative analysis data uses content analysis10.

RESEARCH RESULTS

General Characteristics of Informants

The general characteristics of the informants included dominance (residence), gender, age and marital status and their level of education.

Table 1. shows that informants from South Sulawesi province were 23 people (76.7%) and informants from outside the province of South Sulawesi as many as 7 people (23.3%), the number of male informants was 10 people (33.3%) and 20 female informants (66.7%). The most age is 46-60 years which is 19 people (63.4%). Generally, there were 26 married informants (86.7%). The disease burden category perceived by patients as many as 23 people (76.7%) stated weight.

Table 1. General Characteristics of Informants

Informant characteristic	Number	(%)
Living Home		
Sulawesi Selatan	23	76,7
Outside Sulawesi Selatan	7	23,3
Sex		
Male	10	33,3
Female	20	66,7
Age		
> 45 year	7	23,3
46-60 year	19	63,4
> 60 year	4	13,3
Marital status		
Marriage	26	86,7
Not yet	4	13,3
Illness Category		
Slight	2	6,6
Middle	5	16,7
Heavy	23	76,7
Masker use		
Hospital	30	100,0
Visit frequency 1 time	18	60,0
Visit frequency 2 time	12	40,0
Private doctor practice	23	76,7
Visit frequency 1 time	16	55,3
Visit frequency 2 time	11	36,7
Alternative Medicine	19	63,3
Alternative Medicine	19	63,3
Visit frequency 1 time	17	56,7
Visit frequency 3-4 time	2	6,6
Family Treatment		
By family	12	100,0

The utilization of hospitals is 30 people (100.0%) with frequency of visits 1-2 times, private practice doctors as many as 23 people (76.7%) with a frequency of 1-2 times, and alternative treatments 19 people (63.3%) among them 17 people (56.7%) frequency of visits 1-2 times, while 3-4 times there are 2 people (6.6%). All cancer patients (100.0%) were cared for by their families, not only the nuclear family but also their close relatives.

Characteristics of Informants Based on Economic Status

Table 2. shows the employment status of informants where as many as 11 people (36.7%) as civil servants / TNI / Polri, entrepreneurs as many as 10 people (33.3%) and not working or as Housewives (IRT) there are 9 people (30 , 0%). Their income above UMP is above Rp. 2,400,000 - up to Rp. 5,000,000 as many as 22 people (73.3%) and income of more than Rp. 5,000,000, - as many as 8 people (26.7%). Most of the informants have health insurance such as the Health Insurance Agency (BPJS) in the Health and Card Health Center (KIS) sectors with 24 people (80.0%).

Table 2. Characteristics of Informants Based on Economic Status

Informant Characteristic:	Number	(%)
Occupational status		
PNS/TNI/Polri/	11	36,7
Private	10	33,3
Not working	9	30,0
Income (Rp/ month)		
2,400,00 - 5,000,000	22	73,3
> 5,000,000	8	26,7
Health insurance		
Available	24	80,0
Not	6	20,0
Elder insurance		
Available	11	36,7
Not	19	63,3
Money difficulty		
Yes	30	100,0
Not		

Economic and Social Consequences

The main dimensions of the results of in-depth interviews are economic consequences (affordability of treatment, affordability of consumption of other goods, and factors that influence economic difficulties) and the social consequences of patients [11,12], as explained in the following detail.

Economic consequences

1. Treatment work

Affordability of treatment refers to the patient's ability to pay for the treatment and care needed to manage the disease condition and its consequences. The patient expressed concern about the financial pressures he felt as a result of the high costs of treating and managing his illness (for example, pocket expenses for medicines, routine checks, specialists and other medical care), often accompanied by existing economic constraints and lack of supporting resources.

As an example :

"I use free medication using the Indonesia Healthy Card (KIS), but experience cost difficulties when there are additional costs that are not covered by KIS" (Housewife, 37 years old)

The results of the in-depth interviews also showed that all informants experienced financial difficulties when they had to meet other maintenance costs, outside the National Health Insurance (JKN) scheme such as BPJS Health / Employment and KIS.

As an example :

"Before doing chemotherapy there is usually a laboratory examination, patients have to spend millions of dollars. Often the medicine for chemotherapy is not available so the patient is told to go home, if he has to buy it himself. The cost is very expensive so it cannot afford to buy and choose the medicine available "(Housewife, 52 years old)

As an example :

"Every time I take medication to the hospital, I have to pay a transportation fee of Rp. 1 million per trip, the cost of boarding is Rp. 500 thousand and for credit at least Rp. 200 thousand." (Civil Servants, 50 years)

Cost constraints to access health services, especially felt for patients from outside the province of South Sulawesi because they have to pay for transportation, boarding and communication costs.

As an example :

"Every time I take medication to a private practice doctor, I spend at least Rp 2 million for multivitamin purchases and so on." (Private employee, 41 years)

Alternative medicine is a conventional and herbal treatment / therapy effort as an alternative or complementary to modern medicine. Some informants said "The cost of alternative medicine is only Rp. 50,000 - Rp. 100,000, - once a visit. Usually in the form of clear water, rubbed on a place that is sick or drunk. Herbal medicines can reach IDR 2,000,000 / package. We use it at most twice just because it's expensive."

1. Affordability of Other Goods Consumption

Affordability is also related to the patient's ability to pay for the additional needs needed to manage their disease, such as: healthy food, exercise and healthy walking membership for cancer patients through the Indonesian Cancer Foundation (YKI) and other social activities.

Discretionary expenses include reducing more expensive and healthier foods, reducing participation in regular sports programs at the gym or other places.

As an example :

"I cannot do vacation activities or renovation of houses that incur quite high costs." (PNS, 47 years). Incidental costs (make a choice between expenses for health care or other daily expenses). Generally informants do not have incidental costs, they tend to choose to meet their daily needs if they have to be faced with the cost of medical treatment. "If I am given a choice between medical expenses and the daily cost of living, it will prioritize daily expenses."

2. Factors that influence economic difficulties

Factors that influence whether patients experience economic difficulties include pension salary recipients, pension savings (taspen), health insurance such as BPJS and KIS.

As an example : "I have retired, but still guaranteed by the health BPJS, thus reducing medical expenses. After all, I received a retirement salary and had a retirement savings account (Taspen). "(Retired, 62 years old). But for some informants, this support is still inadequate to overcome economic difficulties and the additional costs not covered by the National Health Insurance (JKN) scheme or other supporting actions are an economic burden on their lives. For those who do not receive pension benefits or other government subsidies, economic difficulties are tightly felt and recognized to have a significant impact on the management of their disease.

As an example: "I don't work, and my husband is only a private employee with a mediocre salary. I feel the burden of medical expenses and care imposed on the family. "(Housewife, 52 years)

2. Patients' Social Consequences

As an example : "My husband is looking for other jobs that can be better expected to cope with a significant decline in income so that he can still take care of me" (Housewife, 39 years old). One of the things that made us burdened by debt was burdensome because of the arrears of credit at the Bank.

DISCUSSION

This research is in line with some of the previous studies conducted by the Group5, Davidoff13, and Guy14, where the symptoms of financial catastrophe in patients were experienced by almost all patients who spent as much as 30% or more of their primary income. stairs and pocket money for cancer treatment costs. Other problems faced by patients, especially those domiciled outside the province of South Sulawesi, such as the provinces of Southeast Sulawesi, East Nusa Tenggara and North Kalimantan, experience difficulties in accessing health services in the form of transportation, accommodation and communication costs. They have to spend an additional million rupiah to buy airplane tickets, rent boarding houses, and buy credit15-17. Additional incidental costs are faced with the difficulty of making a choice between spending on medication and health care or other daily expenses. They can only compromise if they want to meet their child's needs. This means that even paying the lowest cost of living poses a challenge.18-21

With the implementation of Universal Health Coverage in Indonesia starting January 1, 2019, it is expected that no more sufferers of cancer will escape government support through their participation in the JKN scheme. However, the desire of BPJS Kesehatan to cut service facilities for patients with catastrophic diseases such as cancer, will become a new problem for health services, especially for people with cancer. The decrease in income revealed in this study was mainly due to the decline in patient productivity due to cancer. The decrease in income also results in the ability to pay for medical and non-medical expenses. This has social consequences, especially in redeeming the additional costs of treatment and care that is quite large. Significant financial consequences for cancer sufferers (having to reduce expenses, drain savings, borrow money or add bank credit), a combination of additional costs and drastic expenses, can cause anxiety and stress. It can even increase financial stress (financial stress), then it will also increase depression, anxiety and stress in cancer patients22-23.

CONCLUSION

This research is a qualitative study that examines the economic burden of cancer based on the perceptions of patients and their families. This study provides insight into the economic stress factors associated with treating cancer and evidence that these economic difficulties require households to make difficult decisions between the cost of care and basic living costs, triggering the symptoms of financial catastrophe.

Conflict of Interest : None

Ethical Clearance: from Faculty of Public Health, Hasanuddin University

Source of Funding: Faculty of Public Health, Hasanuddin University

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The Efectiveness of 0.03% Bimatoprost Solution Vs Minoxidil 5% in Androgenic Alopecia

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ABSRTACT

Introduction. Androgenic alopecia (AGA) is the most common type of progressive hair loss with an incidence that increases with age. The role of dihydrotestosterone in AGA pathogenesis has been well-established. However, an incidental eyelash and eyebrow growth in patients treated with prostaglandin analogues, bimatoprost and latanoprost, has led to a hypothesis of their possible roles in inducing scalp hair growth. Methods This randomized-controlled trial included 6 male subjects, randomized into 2 groups, each consisting of 8 subjects which were given either topical bimatoprost 0.03% or topical minoxidil 5%. Hairs on the affected areas were shaved and both the terminal hair (hairs with diameter of >1 mm) diameter and terminal hair count were measured using a dermoscope on week 0, 4, 8, and 12. A hair sample from the target area was taken and the prostaglandin D2 level was examined before and after 12 weeks of therapy by using ELISA. Independent T-test and paired T-test were used to compare the result. Results When both groups were compared, no significant difference in terminal hair count and diameter was observed ($p > 0.05$). Both the bimatoprost and minoxidil group showed a mean increase of terminal hair diameter and hair count after 12 weeks ($p<0.05$). There was a decrease PGD2 concentration in bimatoprost 0.03% group, but an increase in the minoxidil 5% group ($P>0.05$). No significant side effects were observed. Conclusion; A 12-week topical application of bimatoprost 0.03% results in a significant increase in terminal hair diameter and count. Further studies with longer follow-up duration are needed to establish the effectiveness of bimatoprost in AGA treatment.

Keywords: *bimatoprost 0.03%, minoxidil 5%, androgenic alopecia, prostaglandin*

INTRODUCTION

Androgenic alopecia (AGA) is the most common type of progressive hair loss with an incidence that increases with age.[1] It is estimated that 30% of Caucasian males will develop AGA by the age of 30 years and the risk rises up to 80% by the age of 70 years.[2] This rate appeared to be lower in the Asian and African-American population.[3]

The idea that dihydrotestosterone plays an important role in the pathogenesis of AGA has been extensively studied, resulting in treatment options that aim to inhibit its formation.[4] However, an incidental eyelash and eyebrow growth in patients treated with prostaglandin analogues, bimatoprost and latanoprost, has led to a hypothesis of their possible roles in inducing scalp hair growth.[5, 6]

Bimatoprost is a prostaglandin analogue of prostaglandin F2α and studies have shown that the application of topical bimatoprost resulte in increase eyelash hair growth, with extensive efforts to treat alopecia on the scalp.[7] Garza et al showed a positive effect on hair growth as a result of the effects of Bimatoprost towards prostaglandin E2 (PGE2) and prostaglandin F2α (PGF2α).[8]

Prostaglandins are selectively called prostanoids which is formed when arachidonic acid, an unsaturated fatty acid containing carbon atoms, released from the

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plasma membrane by phospholipase and metabolized through prostaglandin G/H synthetase or cyclooxygenase. There are 4 main bioactive prostaglandins produced in vivo; prostaglandin E2 (PGE2), prostacyclin (PGI2), prostaglandin D2 (PGD2), and prostaglandin F2α (PGF2α).[9] Prostaglandin D2 (PGD2) has recently been identified as a risk factor in androgenic alopecia.[7] PGD2 inhibits the growth of human hair follicles and inhibits hair growth in rats through prostaglandin receptor type II (DP2). Based on these findings, the PGD2-DP2 pathway has been proposed as a new potential target for the treatment of androgenic alopecia, but the underlying mechanism is still unclear.[10] In addition, to date, no clinical trials observing the effect of bimatoprost on hair growth are available.

This study aims to evaluate the effectiveness and safety profile of bimatoprost as an alternative treatment in patients with androgenic alopecia by comparing it to minoxidil, which is the standard therapy for androgenic alopecia.

MATERIALS AND METHOD

The study was conducted in the Dermatovenereology Department, Faculty of Medicine, Hasanuddin University and has obtained approval from the Institutional Ethical Review Board. This was a clinical trial using a prospective pre-and post-treatment method.

A total of 16 male subjects, randomized into 8 subjects per treatment arm, were included in this study. Patients eligible in this study were 20 to 40-year-old males with androgenic alopecia (Norwood-Hamilton degrees ≥ III) and willingness to maintain the same hairstyle, length and color of hair during the study. Informed consent was obtained from each subject. The exclusion criteria were the use of low level light comb for hair care, application of topical steroids / NSAIDs on the scalp and subject with scalp infections and various disorders of the scalp.

All subjects were diagnosed with androgenic alopecia from history taking, physical examination and dermoscopic examination. Hairs on the affected areas were shaved 1-2 cm above the scalp on the initial visit and every follow up visit on week 0, 4, 8, and 12. The target therapeutic area was marked using a tattoo with a size of 1 cm x 1 cm. During each follow-up visit, the terminal hair (hairs with diameter of >1 mm) diameter and terminal hair count were measured using a dermoscope (Firefly™ model DE350). Documentation and side effects were recorded in each follow up visit. In addition, a hair sample from the target area was taken and the level of prostaglandin D2 was examined before and after 12 weeks of therapy by using ELISA (Human PGD2 ELISA Kit, Cat No. E0989Hu, Bioassay Technology Laboratory).

The data in this study was analyzed using Statistical Package for Social Sciences (SPSS) 21.0 for Windows (SPSS Inc. Chicago, IL, USA). Results were presented in the form of tables and charts. The statistical tests used were independent T-test and paired T-test. A p-value of less than 0.05 was considered as significant.

RESULTS

A total of 16 subjects were included in this study. Most participants were in the 30-39 years age group with a total of 9 subjects (56.25%). This was followed by the 20-29 years age group with a total of 6 subjects (37.5%), and the ≥40 years age group with 1 subject (6.25%). Eleven subjects (68.75%) had a family history of androgenic alopecia. Six subjects (37.5%) were classified as grade III and IV according to the Norwood-Hamilton classification, three subjects with grade VI (18.75%), and one subject with grade V (6.25%).

Table 1 showed the comparison between terminal hair diameter and terminal hair count on the affected area in all subjects in each follow-up visit. There was no significant difference between both groups at the beginning, during and the end of the study (p> 0.05).

Table 1. Changes in terminal hair diameter and hair count in each group

Time of Measurement	Group	N	Mean	SD	P-value
Terminal Hair Diameter					

Cont... **Table 1. Changes in terminal hair diameter and hair count in each group**

T0	Bimatoprost 0,03%	8	0,0561	0,0599	0,312
	Minoxidil 5%	8	0,0858	0,0531	
T4	Bimatoprost 0,03%	8	0,1111	0,0056	0,767
	Minoxidil 5%	8	0,1119	0,0052	
T8	Bimatoprost 0,03%	8	0,1129	0,0049	0,515
	Minoxidil 5%	8	0,1121	0,0036	
T12	Bimatoprost 0,03%	8	0,1129	0,0051	0,630
	Minoxidil 5%	8	0,1121	0,0044	
Terminal Hair Count					
T0	Bimatoprost 0,03%	8	2,625	4,14	0,216
	Minoxidil 5%	8	6,000	6,05	
T4	Bimatoprost 0,03%	8	9,500	8,96	0,805
	Minoxidil 5%	8	10,625	8,95	
T8	Bimatoprost 0,03%	8	16,50	13,41	0,846
	Minoxidil 5%	8	17,75	11,78	
T12	Bimatoprost 0,03%	8	23,375	14,97	0,630
	Minoxidil 5%	8	24,625	13,15	

****Independent T-test***

Both groups did show a significant increase before and after treatment as shown in table 2. The bimatoprost group showed a mean increase of 0.0568 and 20.75 in the terminal hair diameter and hair count after 12 weeks, respectively, which was statistically significant ($p<0.05$). The minoxidil group also showed a mean increase of 0.0259 and 18.625 in the terminal hair diameter and hair count, respectively, with a statistically significant result recorded in the terminal hair count ($P<0.05$).

Table 2. Terminal hair diameter and hair count before and after treatment

Time of Measurement	**Group**	**N**	**Mean**	**P-value**
Terminal hair diameter (T0-T12)	Bimatoprost 0.0 3%	8	0,0568	0,012
	Minoxidil 5%	8	0,0259	0,484
Terminal hair count (T0-T12)	Bimatoprost0,03%	8	20,75	0,012
	Minoxidil 5%	8	18,625	0,012

****Paired t-test***

Table 3 showed PGD2 concentration before and after treatment in both groups. There was a decrease PGD2 concentration in bimatoprost 0.03% group, but an increase in the minoxidil 5% group. There were no significant results in the concentration of prostaglandin D2 before and after therapy in both groups ($P>0.05$).

Table 3. Prostaglandin D2 concentration before and after treatment

Time of Measurement	**Group**	**N**	**Mean**	**SD**	**P-value**
PGD2 on day 0	Bimatoprost 0.03%	8	199,32	199,65	0,394
	Minoxidil 5%	8	66,39	104,29	
PGD2 on week 12	Bimatoprost 0.0 3%	8	192,31	268,75	0,911
	Minoxidil 5%	8	179,35	320,21	

****Mann-whitney test***

The side effects of this study were shown in table 4. Erythema and pruritus were observed in both groups. More than half (62.5%) of the subjects in the minoxidil groups experienced erythema. These side effects, however, were mild and did not require treatment cessation.

Table 4. Side effects found during the study

Groups	Side Effects	N
Bimatoprost 0,03%	Erythema	3
	Pruritus	3
Minoxidil 5%	Erythema	5
	Pruritus	2

DISCUSSION

Androgenic alopecia (AGA) is known as a pattern of hair loss in men and women characterized by progressive miniaturization that does not cause scarring of hair follicles with a distribution pattern that tends to men compared to women.[11] AGA prevalence varies between races and ethnics. In Asian population, several studies have been carried out showing lower rates in white skin population with a prevalence of 20% in men and 5-6% in women. Prevalence increases according to age in all populations. Hair thinning occurs at the beginning of puberty.[12] Studies by Faghihi et al showed that from 94 samples aged >18 years old, the mean age was 30.46 ± 6.28 years old.[13] Study by Olsen et al showed from 352 subjects with MPHL age 20-49 years with a mean age of 39.2 years old.[14] The results of our study has similar result with the highest frequency found in 9 subjects (56.25%), with an average age of 32.62 ± 5.795 years old. Severity of AGA is directly proportional with increasing age.

This study showed that there was a significant increase in terminal hair count in both groups (P <0.05). In terms of terminal hair diameter, the results were significant in the bimatoprost 0.03% group (P <0.05) but not significant in the minoxidil 5% group (P> 0.05). A study showed that Bimatoprost 0.03% solution was shown to increase the percentage of eyelash follicles in the anagen phase and prolong this phase. In addition, bimatoprost 0.03% induces stimulation of melanogenesis, which results in darker eyelashes and increases the size of the dermal papilla and hair bulb thus affecting the thickness of the eyelashes.[15] The results of this study are in accordance with a double-blind, randomized phase II study conducted on 244 men to compare two formulations of bimatoprost solution with vehicle, which showed a greater change in the terminal hair count in the target area in group 1 and 2 (Bimatoprost) with the vehicle compared to the initial condition (group 1: 12.7, group 2: 9.3 and group 3: 5.8 terminal hair/cm^2) and changes in terminal hair diameter were greater in group 1 and 2 compared to the vehicle group after 6 months of therapy (group 1 = 0.067 ± 1,185, group 2 = 0,92 ± 1,435 vehicle group 0.05 ± 1,018 mm/cm^2).[16]

This study showed a decrease in PGD2 concentration in the bimatoprost 0.03% group but there was an increase in PGD2 concentration in the minoxidil 5% group before and after treatment (p >0.05). There is a fundamental role of prostaglandins in modulating the cycle of hair follicles and regulate hair growth, especially prostaglandin D2, prostaglandin E2 and prostaglandin F2α. Prostaglandin D2 inhibits hair growth in AGA.[9] However, the underlying mechanism has not been clearly identified.[17] Bimatoprost is a prostaglandin F2α analog. The mechanism of action of the prostaglandin analogue on hair growth is still unclear. It is suspected that prostaglandin analogues induce hypertrichosis through their effect on the prostaglandin target receptors in the hair follicles.[15] The prostaglandin D2 receptor is in the outer root sheath of the hair follicle. The exact location of the receptor illustrates the importance of hair follicle activity. Minoxidil, the current approved and most widely used treatment, was also shown to have an effect on prostaglandins.[7] An in vitro study showed that minoxidil stimulates prostaglandin E2 and leukotriene B4 in dermal papilla cells, while prostacyclin synthesis is inhibited. In addition, minoxidil increases the expression of one of the four PGE2 receptors (EP2) which contribute to prolonging anagen.[9]

The side effects occurred in during this study in both groups were erythema and pruritus. This result is consistent with the study conducted by Zaher et al, in which side effects found during application of bimatoprost 0.03% were folliculitis, erythema and pruritus and a burning sensation in the application area.[18] We hypothesize that these occurrences might be due to mild allergic or irritant reaction towards the active compound and/or solvent. In this study, no subjects dropped out as a result to the side effects.

The limitation of this study is that the hair growth phase (anagen, catagen, or telogen) was not identified and hence more precise examination was unable to be conducted.

CONCLUSION

A 12-week topical application of bimatoprost 0.03% results in a significant increase in terminal hair diameter and count. Further studies with longer follow-up duration are needed to establish the effectiveness of bimatoprost in AGA treatment.

Conflict of Interest : None

Source of Funding : Hasanuddin University

Ethical Clearance: Obtained from Medical faculty committee, Hasanuddin University

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Expression of TLR-4 in *Salmonella typhi*-Induced Balb/c Mice Treated by Miana Leaves (*Coleus scutellaroides* (L) Benth)

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ABSTRACT

Introduction: Miana is one of the most widely used medicinal plants in Indonesia because its antibacterial activity, but its mechanisms not clear. This study aims to determine mRNA TLR-4 expression in Balb/c Mice induced by Salmonella typhi after miana leaf extract (MLE) treatment.

Material and Method: Mice were divided into four groups, antibiotic (levofloxacin eight mg/kg body weight) as positive control, placebo (Na CMC), MLE and mixed of MLE and antibiotic. Blood of the mice was taken before (H0) and after induction of 103 CFU/mL Salmonella typhi (H1) and seven days after intervention (H7). The mRNA TLR-4 expression was measured by real time PCR. The results obtained were processed using SPSS.

Results: There were significant difference in H0-H1 for all groups. TLR-4 expression in H1-H7 had a different pattern between placebo and positive control, MLE, and the mixed of MLE and antibiotic. In placebo, there was an increase of TLR-4 expression in H1-H7). In the positive control, MLE treatment group and the mixed of MLE and antibiotic, there was a decrease in TLR-4 mRNA expression.

Conclusions: Miana leaves treatment in Balb/c mice induced by Salmonella typhi significantly gave the same effect as positive control to expression of mRNA TLR-4.

***Keywords**: Toll-like Receptor-4 mRNA, Typhoid Fever, Miana, Real-time PCR, CFU.*

INTRODUCTION

Typhoid fever is an acute infection of the digestive tract caused by Salmonella typhi. Typhoid fever is an endemic disease in Indonesia and often cause an outbreak.[1-3] According to WHO data in 2008, patients with typhoid fever in Indonesia recorded 81.7 per 100,000.[4] Typhoid fever in most developing countries is underestimated so that many cases are undiagnosed.[5]

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Salmonella is a gram-negative rod-shaped bacteria, Enterobacteriaceae family, comprising 2463 serovars.[6] Salmonella has a Vi antigen, an acidic polysaccharide polymer present on the surface of the membrane. Salmonella typhi is an intracellular facultative microorganism that can live and even multiply in macrophages, resistant to lysosomes, has the ability to prevent and inhibit fusion of phagolisosomes.[7-9]

One of immunological mechanism against Salmonella typhi is by spurring macrophage function to destroy and eliminate bacteria. By complex of Toll-like receptors (TLR)-5 and TLR-4/MD2/CD-14, macrophages recognize pathogenic molecular patterns

(PAMPs) such as flagella and lipopolysaccharides.[2-3] The bond between LPS and TLR4 that activates MyD88 plays an important role in controlling exponential growth of Salmonella typhi.[10]

The existence of resistance problems of some antibiotics in the treatment of typhoid fever encourages the development of a new paradigm in traditional to treat typhoid fever.[11] Natural products comprise one of the most popular sources of complementary and alternative medicines for treating inflammatory and immune disorders.[12] The facts show that medicinal plants play a vital role in maintenance health because they have many advantages, among others, easy to obtain, very cheap and have very little side effects.[13-15] The use of medicinal plants in most developing countries as a primary means for maintaining health has been considerably observed by UNESCO.[16] Miana leaves contain flavonoid and tannin compounds, in which flavonoid has antibacterial activity because it can denature and coagulate bacterial cell protein.[15]

MATERIALS AND METHOD

Settings and Design

This study was conducted at Laboratory of Molecular Biology and Immunology, Faculty of Medicine, University of Hasanuddin, Makassar, South Sulawesi, Indonesia. This was a laboratory experimental study in Balb/c mice animal model with a simple randomized design.

Balb/c mice

Balb/c mice (35-50 grams) were obtained from the Laboratory of Molecular Biology and Immunology, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia. They were well kept under both 12-h light and 12-h dark periods, fed and drink sufficiently for seven days. They were divided into four groups (n = five/group) based on intervention, positive control (antibiotics), negative control (placebo), MLE; and mixed of MLE and antibiotics. Blood samplings were performed three times, before Salmonella typhi induction (H0), a day after Salmonella typhi induction (H1) and seven days after intervention (H7).

Miana Leaf Extract (MLE)

Leaves of miana were obtained from Tana Toraja district, South Sulawesi, Indonesia and extracted at Phytochemical Laboratory, Faculty of Pharmacy, Hasanuddin University, Makassar, Indonesia. Miana leaves powder were macerated with alcohol 70% for about 48 h occasional shaking. Dose of MLE used ini this study was 510 mg/kg body weight (bw), suspended with natrium CMC 15 w/v.[16]

Salmonella typhi preparation

S. typhi bacteria was from the Molecular Biology and Immunology Laboratory, Faculty of Medicine, University of Hasanuddin, Makassar, Indonesia. The amount was 10^3 CFU/mL (Mc Farland Standard).

Nucleic Acid Extraction

The sample volume of about 100 **µg**/ul blood was fed into 900 **µl** of "L6" solution consisting of 120g of Guanidium thyocyanate (GuSCN) in 100 ml 0.1 M Tris HCl , PH 6.4, 22 ml 0.2 M Ethylene Diamine Tetra Acetate (EDTA) pH 8.0 and 2.6g Triton X-100 (Packard, Instrumens) with final concentration 50 mM Tris HCl, 5 M GuSCN, 20 mM EDTA, 0.1% Triton X-100. Next played at 12,000 rpm. The sediment added a 20 **µl** diatom suspension consisting of 50 ml of H2O and 500 **µl** of 32% (w / v) "Celite" (Jansen Chimica, Beerse, Belgium, 10,846.79), then vortex and centrifuged in a 1.5 ml eppendorf tube at 12,000 rpm for 15 min. The supernatant was removed and the sediment was washed with a solution of "L2" consisting of 120 g of GuSCN in 100 ml 0.1 M Tris HCl, pH 6.4 by adding 1 ml of "L2" solution. Then vortex and centrifuged at 12,000 rpm for 15 min, then washing repeated 2 times using "L2" solution, followed by washing with 1 ml of 70% ethanol twice and 1 ml of acetone. The result was then heated in a water bath at a temperature of 56oC for 10 min and added 60 **µl** of "TE" solution comprising 1 mM EDTA in 10 mM Tris HCL pH 8.0, then vortex and centrifuge followed at 12,000 rpm for 30 s, then incubated in Oven for 10 min at a temperature of 56oC. Then performed vortex and centrifuge again for 30 sec at a speed of 12,000 rpm and taken supernatant. The supernatant of this process will be obtained by nucleotide extraction and stored at -80° C before PCR analysis.[17]

Real Time Polymerase Chain Reaction

Quantitative Real-Time PCR analysis total RNA was extracted from blood using L6 buffer according to the Boom methods. RNA quality and concentration were detected by a NanoDrop 2000 device (Thermo Scientific,

Wilmington, DE, U.S.A.). In a reaction volume of 20 **µL** using M-MLV reverse transcriptase, 2 **µg** RNA was then reverse transcribed to cDNA using a RT-PCR kit. The mRNA level of the target gene was quantified by real-time PCR using a SYBR® Premixed E x Taq kit on a CFX Connect system, Biorad Laboratories, Real Time PCR 96 well 0.1 ml, USA. The standard PCR conditions were as follows: 95ºC (10 min), 40 cycles of 95ºC (15 s) and 60ºC (1 min), followed by a standard denaturation curve. mRNA expression levels of the relevant genes and β-actin were determined using relative quantification by comparison with a standard curve for each gene, which was included in each PCR run generated from the serial dilution of a cDNA pool from the blood samples in the study. The primer pairs TLR-4 For: TGACAGGAAACC CTATCCAGAGTT and TLR4 Rev: TCTCCACAGCCACCAGATTCT and β-actin For: AGA GGGAAATCGTGCGTGAC and β-actin Rev: CAATAGTGATGACCTGGCCGT. Relative mRNA levels were calculated using the 2−ΔΔCt method with data normalized to the Beta actin housekeeping gene.[18-21]

STATISTICAL ANALYSIS

All groups of data are normally distributed with significant values of 0.076-0.200 (Kolmogorov-Spirnov Test) and 0.064-0.964 (Saphiro Wilk Test). Repeated Anova was used to test the mean difference on mRNA expression of TLR-4 between H0, H1 and H7 in each group. All statistics were performed on IBM SPSS version 20 statistical software.

RESULTS

This study showed a significant difference in mRNA TLR-4 expression in H0-H1for all groups with p = 0.000. Differences in mRNA expression of TLR-4 in H1-H7 had a different pattern between negative control and positive control, MLE treatment group and the mixed of antibiotic and MLE treatment group (Figure 1). In the negative control, there was an increase in mRNA expression of TLR-4 from H1 to H7 with significance level p=0.000, mean difference 4.94 and CI95% 4.71-5.17. In the positive control group, MLE treatment group and the mixed of antibiotic and MLE group, there were decrease in mRNA expression of TLR-4 with mean difference in negative values (Figure 1).

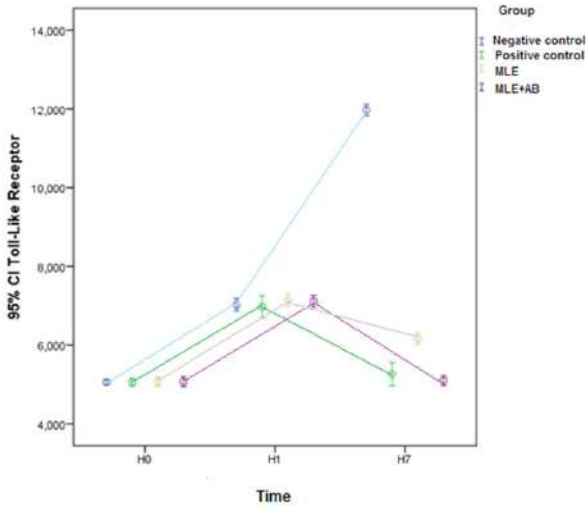

Figure 1: Trend mRNA TLR-4 Expression for placebo, positive control, MLE and Mixed of MLE and Antibiotic in H0, H1 and H7

In the positive control, there was a significant decrease in mRNA expression of TLR-4 with significance level p=0.000, mean difference -1.70 (CI95% (-2.02) - (-1.38), had a greater decrease than the MLE group with mean difference - 0.98(p=0.000, CI 95% (-1.18)-(-0.77)) whereas in the mixed of antibiotic and MLE group had the highest decrease mRNA expression of TLR-4 with mean difference -2.01, significance level p = 0.000 and CI 95 % (-2.27)-(-1.75) (Table 1).

Table 1. Differences Analysis of mRNA expression of TLR-4 Balb/c Mice between before (H0) and 24 hours after (H1) Salmonella typhi induction and Seventh Day After Intervention (H7)

Group	H0	H1	Mean Difference (95%CI)	P*	H7	Mean Difference (95%CI)	P*
	Mean±SD	Mean±SD			Mean±SD		
Negative Control	5.058±0.495	7.025±0.128	1.96(1.82)-(2.11)	0.000	11.971±0.114	4.94(4.71)-(5.17)	0.000
Positive Control	5.057±0.078	6.970±0.225	1.91(1.60)-(2.22)	0.000	5.265±0.238	-1.70(-2.02)-(-1.38)	0.000
MLE	5.071±0.094	7.148±0.132	2.07(1.90)-(2.24)	0.000	6.164±0.118	-0.98(-1.18)-(-0.77)	0.000
MLE+AB	5.069±0.099	7.111±0.118	2.04(1.93)-(2.15)	0.000	5.100±0.102	-2.01(-2.27)-(-1.75)	0.000

DISCUSSION

Significant increase of TLR-4 expression occurred in H0-H1 for all groups. Salmonella typhi has a very immunogenous structure called lipopolysaccharide (LPS). LPS are bound by LPS-binding protein (LBP) in the blood and then activate TLR4. The activated TLR4 recruits the MyD88 adapter protein. Then MyD88 conscripts IRAK4, IRAK1 and IRAK2. The IRA kinase then phosphorylates and activates the TRAF6 protein allowing NFkB to diffuse into the nucleus and activate the transcription and induction of inflammatory cytokines.[3,10,22-23]

At H7, the MLE group showed a significant decrease in TLR-4 expression, as did the positive control and the mixed of antibiotic and MLE group. Alleviation of TLR-4 expression at H7 in the group administered by MLE, positive control and the mixed of antibiotic and MLE group were linear to LPS levels in mice's blood indicating a healing process of Salmonella typhi infection in body of mice. In contrast, TLR-4 expression in negative control continued to increase until H7indicating that LPS remained high. Another study said that the most vital thing in stimulating a non-specific immune response against LPS as a part of Salmonella typhi is activation of TLR-4. The presence of LPS will stimulate TLR-4 then cause nuclear translocation of NFκB and TNF-α cytokines as well as inducible NO synthase (iNOs).[22]

One of the herbal mechanisms as complementary and alternative medicine (CAM) in improving immunity is modulation of pathogen response/T cell regulation. Herbs can enhance immunity by changing the balance between inflammatory and anti-inflammatory cytokines and modifying the level and quality of immune responses of T cells, B cells and cytokines.[24] Miana as one of the medicinal plants family lamiaceae contain among other essential oils, flavonoids, tannins and alkaloids.[15] Administering of MLE and combined antibiotic and MLE had an effect for mRNA expression of TLR-4 subsequently affecting host immunity (mice).

Previous study showed that MLE contains active substances such as alkaloids, saponins, steroids, tannins, triterpenoids, flavonoids and polyphenols that are potential as immunomodulators. MLE contains chemical components as active substances that have antioxidant activity with IC50 MLE value = 34.407 ppm.[15] Another study mentioned that the main active substance of the plant Coleus aromaticus is an essential oil. The potential of Coleus aromaticus therapy can be used as a potential source of bioactive compounds. Coleus aromaticus antioxidant activity is reported mainly due to rosmarinic acid, chlorogenic acid and caffeic acid. Essential oils have a large antimicrobial activity in gram-negative, gram-positive, drug-resistant microorganisms, phytopathogenic microorganisms and fungi.[13,25] According to Kouakou (2013), immunomodulatory activity is determined by knowing the ability of plant extracts to induce NO (nitric oxide), cytokine production and activated mitogen protein kinase fosforilase (MAPK).[26]

CONCLUSIONS

MLE with dosage 510 mg/kg body weight in Balb/c mice induced by Salmonella typhi showed a similar value to positive control on mRNA TLR-4 expression. This study represent that MLE could be a pledging alternative medicine in patients with Salmonella typhi infection.

Conflict of Interest: The authors declare no conflicts of interest regarding the publication of this paper.

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