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Nurses Knowledge Regarding Safety Measures at Critical Care Units in Al-Hillah Teaching Hospitals

A Thesis

Submitted by

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To the Council of the College of Nursing, University of Babylon in Partial Fulfillment of the Requirements for the Degree of Master in Nursing Sciences.

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بِسْمِ اللَّهِ الرَّحْمَـٰنِ الرَّحِيمِ

﴿وَلَا تَقُولَنَّ لِشَيْءٍ إِنِّي فَاعِلٌ ذَٰلِكَ غَدًا * إِلَّا أَنْ يَشَاءَ اللَّهُ وَاذْكُرْ رَبَّكَ إِذَا نَسِيتَ وَقُلْ عَسَى أَنْ يَهْدِيَنِ رَبِّي لِأَقْرَبَ مِنْ هَذَا رَشَدًا﴾

صدق الله العظيم

[الكهف: 23، 24]

Supervisor Certification

I certify that this thesis, which entitled **"Nurses Knowledge Regarding Safety Measures at Critical Care Units in Al-Hillah Teaching Hospitals"** submitted by **Rabab Jalil Wadi** was prepared under my supervision and guidance at the Department of Adult health nursing, College of Nursing, University of Babylon as a partial fulfillment of the requirements for the Degree of Master of sciences in Nursing.

Supervisor

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/ / 2022

Certification

We, the examining committee, certify that we have read this thesis entitled **"Nurses Knowledge Regarding Safety Measures at Critical Care Units in Al-Hillah Teaching Hospitals",** which is submitted by **(Rabab Jalil Wadi)** from the department of Adult health Nursing, and we have examined the student in its contents, and what is related to it and we decide that it is adequate for awarding the Degree of (**Master)** in Nursing Sciences with specialty of **(Adult health Nursing)**.

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/ / 2022

Dedications

A special dedication to the soul of my martyr brother.

To my father and mother for their continued support and love.

To my brothers and sisters for their love.

To my husband for standing by my side and for his endless support.

To my second family, my husband's family for their support.

To everyone who helped me.

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Abstract

Background: The need for nurses to be aware about hospital safety measures is critical issue in nursing as a response to the rapidly change in the health care environment. Safety measures are essential to a safe, competent, skillful nursing practices and safe workplace. The responsibility of critical care nurses in patient's safety is determined by the needs of individual patients, who need constant, careful monitoring, dynamic data processing, and forewarning of potential consequences.

Objective: To assess nurses' knowledge regarding safety measures at critical care unit in Al-Hillah teaching hospital.

Methodology: A cross-sectional design descriptive study selected to evaluate nurse's knowledge about safety measures at critical care units, this study carried out from the period between (19. Oct.2021 to 2. May.2022). Purposive non-probability sample of (150) critical care nurses, (70) female and (80) male, who representing approximately all nurses who involved in the direct care of patients. To achieve the study objectives special questionnaire prepared which consist of three parts, demographical characteristics, general information, while the third part consist of a safety measure domains extended over (55) items.

The content validity of the instrument was obtained by penal of (9) expert. Alpha Cronbach correlation used as statistical method to calculate the reliability of the prepared questionnaire which is statically acceptable (r=0.706).

Results: The finding presented that the most of the sample of the study 142(94.7%) were between (20-30) years of age, 80(53.3%) were male nurses, 83(55.3%) of them were married, while the result shows that most of the participants 85(56.7%) were bachelor degree holder and 96(64.0%) were rural resident, most of the study sample 89(59.3%) were with one years of experience in the critical care.

Conclusions: Most of the nurses who participate in the study shows unsatisfactory level of knowledge regarding safety measures.

Recommendations: Continues educational programs are recommended to develop nurses knowledge related to safety measures aspects.

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List of Abbreviations

Item	Meaning
BBI	Blood Born Infection
℃	Celsius
CDC	Centers for Disease Control And Prevention
CO2	Carbon Dioxide
CPOE	Computerized Physician Order Entry
DB	Decibel
EPA	Environmental Protection Agencies
ETO	Ethylene Oxide
EVD	Ebola Virus Disease
F	Fahrenheit
FDA	Food and Drug Administration
GIT	Gastro Intestinal Tract
HAI	Hospital Acquired Infection
HBV	Hepatitis B Virus
HCAI	Health Care Associated Infection
HCFC	Hydro Chlorofluorocarbon
HCV	Hepatitis C Virus
HCW	Health Care Worker

HH	Hand Hygiene
HIV	Human Immunodeficiency Virus
HLD	High Level Disinfection
ICU	Intensive Care Unit
ISMP	Institute for safe medication practices
IV	Intravenous
MIP	Maximal Inspiratory Pressure
NSIs	Needle Stick Injuries
NSSI	Needle Stick And Sharp Injuries
OSH	Occupational Health And Safety
OSHA	Occupational Safety And Health Administration
PH	Power of Hydrogen
PPE	Personal Protective Equipment
SARS	Sever Acute Respiratory Syndrome
SCBA	Self-Contained Breathing Apparatus
SENIC	Study on The Efficacy of Nosocomial Infection Control
SIs	Sharps Injuries
US	United State
WHO	World Health Organization

List of Statistical Symbols

Items	Meaning
%	Percentage
Ass.	Assessment
C.S.	Comparison significant
F.	Frequency
H.	high

L.	low
M.	Moderate
MS.	Mean score
N.	Number of sample
P.	P-Value
R.S.	Relative sufficiency
Resp.	Response
S.	Significant
SD.	Standard deviation
T.	T-test

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Chapter One

Introduction

Chapter One

1.1. Introduction

Patient safety is a fundamental component of healthcare quality, and enhancing critical care unit's nurses' performance remains an objective that every business aims to attain, when providing employees with new development techniques that ensure high-quality work and reduce possible mistakes (Bassuni and Bayoumi, 2015).

The minimal infection prevention techniques that must be employed in the treatment of all patients at all times are known as safety measures. These procedures are intended to safeguard health care workers while also preventing them from transferring illnesses to patients (Arinze-Onyia *et al*.,2018).

For critical care nurses, putting in place safety protocols isn't enough to keep patients safe. They should also improve their professional expertise by participating in continuous learning, as well as communicate well with coworkers, work in teams, and provide high-quality care to critically sick patients. It is crucial to create a safety culture in which critical care unit workers see safety as a top priority at all levels of the organization (Livne & Donchin, 2009).

To achieve a systemic dimension, protective measures for the environment must be better recognized and understood. It must be understood as a cyclical process that considers both the individual who requires care and the circumstances under which that care is delivered, including human materials and resources, interpersonal relationship, interaction among healthcare workers, patient, friends and family, and interaction with the environment (Backes et al.,2015).

Critical care unit are a unique environment designed to care for extremely sick and unstable patient who must stay in the hospital setting. Their complexity is great since they are outfitted with cutting-edge technology and computerized equipment. The pace is hastened here, where aggressive and intrusive treatments are conducted, and the battle between death and life is always present; and death is usually imminent (da Silveira et al.,2010).

Despite reductions in needle stick injury and other related injuries over the past decade, which seem to be the consequence of worker education and the use of safer sharp objects, needles injury to healthcare staff, especially nurses, continue to be a distressingly prevalent occurrence (Cheetham et al.,2021). Needle stick injury are linked to the amount of operations a healthcare workers does that expose him or her to sharp objects, which is influenced by their specialty and working hours. Other factors such as a nurse's gender, age, and experience may influence the kinds and amount of sharps that handled, as well as her ability to use and dispose of them. Nurses may also employ various kinds of equipment, that may or may not be designed to limit their sharps hazards, based on their unit within their institution. Current healthcare safety thinking stresses the role of the environment in the incidence of mistakes and injuries (Clarke,2007).

A variety of contextual elements shape the circumstances in which nurses comes in contact with sharp objects in the instance of needlestick injuries accidents. Which include structural features of hospital, like size and teaching status, which impact institutional clienteles and the requirement for sharps procedures, as well as the kinds and mix of staff in a given work context (eg, high number of healthcare worker in training) (Liyew et al.,2020).

There are other modifiable elements that influence practice and may be influenced by hospital executives. Staffing levels and workplace environment circumstances, for example, are thought to influence compliance to proper safety techniques and have been linked to risk factors for percutaneous injury from used sharps, and also percentages of actual needle stick injuries (AlJohani et al.,2021).

Many various features of working environments may have an impact on safety concerns, but our knowledge of the methods by which they do so is currently restricted. As a result, a thorough review of work environment issues is required, ranging from the condition of nursing across the hospital, to nurse-physician relationships, and the sufficiency of staffing and resource. Human resource procedures have an impact on the total level of experience of hospital workers, which may also have an impact on safety condition (Malinowska-Lipień et al.,2021).

1.2. Importance of the study:

Critical care unit may be a hostile environment for severely sick patients. These patients have psychological and emotional stressors in addition to the physical stressors of sickness, pain, anesthesia, treatments, and mechanical breathing. The unit’s environment is one of the extra elements that is hypothesized to contribute to the illness known as Intensive care unit psychotic disorders. Delirium is linked to a longer stay in the hospitals and a higher death rate. Noise, ambient light, mobility restrictions, and social isolation are all often reported stressful environmental variables. In the past, noise has been considered an important environmental cause of sleep disruption. Sound pressure levels of below 40 dB(A) are generally required to enable sleep, although the auditory threshold for waking may increase when individuals are continually exposed to a noisy environment. The critical sick patients' stress levels are exacerbated by their limited ability

to communicate, eat, and move. Inability to talk seems to be a significant concern with mechanically ventilated patients, and a lack of knowledge as to why they are unable to speak, as well as a dread of never being able to speak again, exacerbates the situation. Improving the unit atmosphere is also crucial, and it entails a committed, empathetic multidisciplinary team, critical care staff education, equipment modifications, and careful consideration of future ICU design (Tim and Alison,2009).

More than Five million patients admitted to hospitals in the U.S each year. Critical care units, which account for fewer than 10percent of total beds in most hospital, account for more than 20percent of all nosocomial infections; acquired infections cause significant morbidity, death, and hospital expenses. In non-cardiac ICUs, infection and sepsis are the major causes of mortality, accounting for 40percent of all ICU expenses. In the current age of critical care medicine, a holistic strategy is required, involving infection prevention committees, antimicrobial stewardship programs, daily reassessments-intervention bundle, detecting and decreasing risk factors, and ongoing staff education programs (Osman & Askari,2014).

Approximately 1 in 200 adults admitted to the critical care unit each year. There were substantial differences in rates of admission, by gender, age, and income level(Mamdouh,2020). According to the WHO, at least one healthcare-associated illness will be acquired by Seven out of every Hundred hospitalized patient in affluent countries and Ten out of Hundred in poor countries during their stay in the hospital. About 30percent of patients admitted to critical care unit in high-income nations have at least one healthcare-associated infections. In low- and middle-income societies, this rate is quadrupled or even triple (WHO,2016).

Incorporating safety measures into daily nursing practices and nursing staff compliance to these measures require an effective charge nurses leading

roles to provide them with life-saving and self-defense actions needs for self-protection and minimizing where possible or eliminating the risks in their workplace (Evans et al.,2012).

The occurrence of adverse health events is an indicator of compromised patient safety. Globally, the reported incidence of adverse health events ranges between 4% and 17%. Interestingly, it was found that around 50% of all reported adverse events which compromised patient safety are preventable (Killam et al., 2017).

Patients safety is an important component of hospitals performance and critical care staff development. Nurses' performance remains an objective that every business aims to accomplish, as well as when providing workers with innovative staff development tactics that ensure high-quality work and minimize potential errors (Vaismoradi,2017). Intensive care units (ICU) deliver lifesaving care for critically ill patient, but they are also associated with a high risk of adverse event and serious mistakes due to the multiple interactions that occur between multidisciplinary health patient, healthcare workers, and equipment with increasingly complex interfaces (Bouldin et al.,2016).

Nursing monitoring is crucial to patient’s safety because nurses may avoid therapeutic injury and safeguard patient in critical care from medical mistakes made by others. The role of critical care nurses in patient’s safety is effected by the specialty's particular requirement, which include continuous, close patient monitoring, dynamic data analysis, anticipating complication, complex decision-making, continuous assessment of intervention strategies, and psychological support for the patients and family members (Chinn & Kramer,2011).

Nursing staff compliance to safety measures combines the most important aspects of universal precautions designed to reduce the risk of

transmission of blood borne and other pathogens as handwashing, use of personal protective equipment as (gloves, apron, face mask and eye glasses), safe handling and disposal of sharps, safe handling of laboratory specimen and respiratory protection with proper body mechanics, safe patient handling and lifting and safe handling of equipment in order to reduce the work related risks among nursing staff (Smolowitz et al.,2015).

Ventilation, fluids and inotropic administration, and renal replacement therapy are just a few of the invasive procedures and medicine prescriptions that critical care nurses are increasingly involved in. Clinical standards and practices can help them achieve positive results. (Garland et al.,2013). Nurses are health care professionals who emphasize on the care for communities, people and families, and in order to maintain, attain, or regain optimum quality of life and health from configuration to death(WHO,2016).

1.3. Statement of the study

Nurses' Knowledge Regarding Safety Measures at Critical Care Units in Al-Hillah Teaching Hospitals.

As a research problem the present study is concerned with assessing the nurses' knowledge regarding safety measures at critical care units. As well as follow-up to the strengths and weaknesses in their knowledge and the seriousness in finding appropriate solutions to resolve as much as possible of the problems dealing with phenomena underlying the study (Nurses' Knowledge Regarding Safety Measures at Critical Care Units). And to meet underlying objectives; the following questions are formed:

1. What are the nurses' knowledge regarding safety measures at critical care units?

2. Dose the sociodemographic variables have influences on nurses' knowledge regarding safety measures at critical care units?

1.4. Objectives of study

The objectives of the present study include the following:

1- To assess nurse's knowledge regarding safety measures in critical care units.

2- To identify demographical characteristics for study sample.

3- To find out the relationship between nursing knowledge regarding safety measures and demographical variables such as (age, gender, educational level, years of experience).

1.5. Definition of Terms

1.5.1. Nurses

1.5.1.A. Theoretical:

A professional competent person who facilities health care services to restore health for sick person while promoting and preventing well-being and well fear for healthy individual (Dunphy et al., 2011).

1.5.1.B. Operational:

Competent person who is knowledgeable and skillful providing care for critical ill person.

1.5.2. Knowledge

1.5.2.A. Theoretical:

Information and skills acquired through learning or experience which regulates intellectual and technical activities of the nurses to provide higher quality of care (Cipriano ,2007).

1.5.2.B. Operational:

Information and scientific facts which acquire through academic or educational program related to safety measures in the critical care units.

1.5.3. Safety measures

1.5.3.A. Theoretical:

Standard practices with minimized harm and occurrence of hazard to protect both the health care workers and patients, during providing care of all patients all of the time (Arinze-Onyia *et al*.,2018).

1.5.3.B. Operational:

Practices and policies which should be followed by the critical care unit nurses to maintain patient's safety and reduce occurrence of risks.

1.5.4. Critical care units

1.5.4.A. Theoretical:

Is special units in the hospital which facilities continues medical and nursing supervision by using close monitoring for patients with life threating conditions (Bhattarai, 2015).

1.5.4.B. Operational:

Special units in the hospital designed with sophistical equipment to provide care for critically ill patients for maintaining health and safety.

Chapter Two

Review of Literature

Chapter Two

Review of literature

2.1. Historical review of safety measures:

In general patient safety was neglected until the problem related to this issue was documented during 1990s. Institute of Medicine's publication assign "To Err is Human: Building a Safer Health System" (Kohn *et al*., 2000), which provided data that catapulted the subject to the top of the policy platform globally and paved the way for today's patient safety movement (Hjort, 2007; Vincent, 2010).

The WHO has been following up on the problem since the founding of the World Alliance for Patient Safety in 2004, investing in campaigns, educational program, studies, and other sources targeted at establishing patient safety actions around the world. Patient safety is defined by the WHO as "the reduction to an acceptable minimum of the risk of unnecessary damage associated with health care," and a patient safety event is defined as "an occurrence or scenario that may have resulted in or did result in needless patient harm" (WHO, 2009).

In a 1999 report on patient safety, the Institute of Medicine reported that almost 100,000 people died in the U.S, as a result of medical mistakes of judgment, at a cost of more than $50 billion yearly. ICU patient are considered to be particularly vulnerable to error; on average, 1.7 errors per patients daily happen, moreover 148,000 life-threatening mistakes anticipated yearly at ICUs in the teaching hospitals alone. regardless all of the attempts to enhance safety of patients, several questions arise about the empirical evidence that safety has

improved, particularly in the ICU. Because, unlike other businesses, healthcare delivery and organization has historically not been considered as a science, it has suffered from quality and safety issues. A novel strategy to increasing ICU safety has recently been introduced and evaluated, that involves safety tools (e.g., daily target sheets, critical care bundle, and a full unit-based safety program) and a framework for monitoring ICU security (Rothschild *et al*.,2005).

The ideas that characterize the science of safety as it pertains to health care are still in their early stages of development. The following are some examples of effective approach for developing a principles acoording to (Rodriguez-Paz & Dorman, 2008):

(a) identifying clinically important issues for improving patient safety or quality,

(b) establishing baseline performance, measuring whether appropriate interventions are used, and/or detecting system failures (presently, a single measure that adequately addresses safety and quality in critical care units is absent).

(c) identifying evidence-based interventions. Health care businesses should demonstrate a commitment to improving the system by empowering competent teams made up of front-line caregiver, manager, and senior executive in order to achieve a successful outcome.

Measuring and re-measuring are required for improvement. Unfortunately, getting measures in patient safety is not always achievable due to the lack of a specified numerator (i.e., the fault) and/or denominator (i.e., the population at risk). Furthermore, the variables that are designed to assess are

embedded in a world of other factors that impact patient safety (e.g., collaboration, communications, organizational/safety culture, and the setting in which care is provided) (Sexton *et al*.,2005)

2.2. Definition of safety measures:

Safety measures are an important part of hospital effectiveness, and trying to improve critical care unit staff nurses' performance is an ideal that every organization seeks to attain. When workers are given new staff strategic initiatives, their work is of higher quality, and mistakes are reduced (Vaismoradi, 2017).

Incorporating safety measures into daily nursing practices and nursing staff compliance to these measures require an effective charge nurses leading roles to provide them with life-saving and self-defense actions needs for self-protection and minimizing where possible or eliminating the risks in their workplace (Evans *et al*.,2012).

2.3. The most common safety measures domains include the following:

2.3.1. Environmental safety:

The environment of a patient encompasses all of the physical and psychosocial variables that impact or affect the patient's existence and survival. This wide concept of environment includes the hospital, long-term care institution, clinic, community center, school, and home, as well as other venues where the patient and nurse interact. Staff members are also protected in a safe workplace, allowing them to perform at their best. Infants, children, elderly individuals, the unwell, the physically and intellectually impaired, the illiterate,

and the destitute are all vulnerable populations that require assistance in creating a secure environment. Meeting fundamental requirements, eliminating physical risks and disease transmission, and regulating pollutants all contribute to a safe environment (Bhattarai, 2015).The goal of the design process is to create a healing environment the result of design that produces measurable improvements in the physical or psychological states of patients, staff, physicians, and visitors. (Hamilton D, 2004)

Environmental safety measures are therefore crucial and should take a proactive approach – always prepared to take care of both unprecedented and day-to-day circumstances. This is best achieved by implementing a system that provides the safest and best quality of patients care. A safe healthcare facility operates in compliance with both local and global standards of safety (Lundstrom *et al*., 2002). Environmental elements consist the following:

2.3.1.a.Temperature:

The average person's comfort zone is between 18.3° C (65° F) and 23.9° C (75° F). Extreme heat, which are common in the summers and winters, have an impact on satisfaction, performance, and safety. Frostbite and unintentional hypothermia are caused by prolonged exposure to extreme cold. Frostbite is a condition in which a portion of the skin's surface freeze as a result of being exposed to extremely low temperatures. Whenever the internal body temperature falls below 35° C (95° F), hypothermia ensues. Hypothermia is a serious disorder that affects the elderly, the young, patient with heart disease, patient who have overdosed on alcohol or drugs, and persons who are homeless. Heatstroke or heat exhaustion occurs when the body's electrolyte balance is disrupted and the core body temperature is raised as a result of exposure to intense heat. Extreme heat poses the highest risk of damage to chronically sick

individuals, elderly persons, and babies. Extremely hot and humid settings must be avoided by these patient (Angus,2014).

2.3.1.b. Noise:

Any undesired or undesirable sound that is subjectively irritating, impairs performance, and is physically and psychologically uncomfortable is referred to as noise. Individuals sensitivities, cultural and societal variables, the perception of having controls over the sounds, and whether it is suitable to the environment are all aspects that impact it. Noise can be constant, variable, or interrupted (Pugh *et al*.,2007). Noise exposure can cause the sympathetic nervous system to respond, increasing heart effort and perhaps affecting breathing muscle performance. Loud noises can increase the need for sedation in critically sick patients, make communication difficult, and lead to deafness (Wenham and Pittard,2009).

2.3.1.c. Light:

The human sleep–wake cycle is known to be tightly related to the environment, and the light–dark cycle, together with social cues and noises, is probably the most significant connecting element. If these connecting elements are changed, sleep–wake cycles can be delayed, and in certain critical care unit, patient is not exposed to any natural light. Patients may lose the ability to discern between night and day, which can lead to confusion. Although the intensity of light on units normally reflects a 24-hour circadian cycle, strong lights from the nurses' station, light that are not lowered, and lights that are switched on at night can all be particularly disruptive to patients' sleep (Wenham & Pittard, 2009).

2.3.1.d. Humidity:

In critical care units, the environment has an impact on infection rates. Infections control in the unit is influenced by the number of patients in the room, whether it is a single or multiple patients room, the amount of space in the room, and the room's architecture. Infection control at the hospital requires generally efficient air conditioning, filtration, heat, and humidity systems. In certain sectors, like as critical care units, these systems are more vital than others (Thompson *et al*.,2012).

The majority of critical patients are in poor clinical condition, with a variety of health issues and underlying disorders. Their thermoregulation mechanism isn't up to the task. Changes in room temperature have a direct impact on body temperature. As a result, the humidity and temperature of such units should be kept within defined ranges. According to the CDC's environmental infection control standards, humidity levels in hospitals must range from 30percent to 60percent, while critical care units should have humidity levels of 30percent to 60percent. (Stephan *et al*.,2005).

2.3.2. Hand hygiene:

Globally, thousands of people die every day due to infections acquired through health care procedures. Transmission of germs during health care primarily occurs through contaminated hands. (Trampuz *et al*.,2004)

Hand hygiene is a general term that includes hand washing (using plain soap and water), antiseptic hand wash (using antimicrobial substances and water), antiseptic hand rub (using alcohol-based hand rub), and surgical hand antisepsis (using antiseptic hand wash or antiseptic hand rub preoperatively by

surgical personnel to eliminate transient and reduce resident hand flora) (Centers for Disease Control and Prevention (CDC,2007)

Hand cleaning entails rubbing a soap or chemical into all of the surface and crevices of the hand. Hand washing is an important part of all isolation precautions since it is the most basic and effective infections control strategy for preventing and controlling the spread of infectious pathogens. Soap or chemical, water, and friction are the three main ingredients of hand washing. Antimicrobial-agent-containing soaps are commonly utilized in high-risk locations including emergency rooms and nurseries. The most significant component of the trio is friction, which physically eliminates dirt and transitory plants. Hand washing is done before eating, after elimination of bodily waste (urination and faces), after contact with body fluid, before and after conducting invasive operations, and after touching contaminated devices. The amount of time necessary for hand cleaning varies depending on the situation. To eliminate transitory flora from the hands, a washing duration of 10 to 15 seconds is advised. In high-risk environments, such as nurseries, a 2-minute hand wash is frequently required. Hands that are soiled generally take longer to clean (Jemal,2018).

Hand cleanliness is widely acknowledged as the most effective way to minimize microbial cross-transmission and lower the occurrence of healthcare-associated illnesses. (Ellingson *et al*., 2014).

Health care-associated pathogens can be received from infected or draining wounds, frequently colonized areas of the intact patients' skin, patients' gowns, bed linen, bedside furniture and other objects in the immediate environment of the patient. Organisms such as S. aureus, Proteus mirabilis, Klebsiella spp., Acinetobacter spp., enterococci, or Clostridium difficile may

play an important role in health care associated infections (HCAIs) (Mithra *et al*.,2019)

According to the WHO, 1,400,000 individuals are affected by nosocomial diseases daily, both directly and indirectly (Hosseinialhashemi et al., 2015). Hand hygiene (HH), which consists of either washing hands with soap and water or using an alcohol-based hand rub, is a simple and efficient technique to avoid infection (Duane *et al*.,2022).

Despite the fact that the hand is continuously classified as the main preventative strategy in WHO recommendations, few of them recommend it in practice. (Polin *et al*., 2012; Mertz *et al*., 2011; Park *et a*l., 2014; Mertz *et al*., 2011). During the epidemic spread of acute respiratory syndrome (SARS), it was discovered in a Chinese study that paying close attention to developing hand-washing technique in healthcare personnel while caring for high-risk patients could dramatically reduce transmission of infection between staff and patient (Bennett *et al*., 2015).

Efforts are being made on a continuous basis to find effective and long-term solution to this problem. The WHO creation of an evidence-based proposal dubbed "My five minutes for hand hygiene" is one such endeavor. Hand hygiene is necessary five times: before handling a patient, before undertaking aseptic and clean procedures, after being in risk of exposure to body fluid, after touching patient, and after contacting patients surrounding. This concept has been effectively used to increase healthcare personnel' awareness of hand hygiene, as well as their training, monitoring, and observation (Boyce *et al*.,2011)

Five moments of hand hygiene which highlighted by WHO includes (Pittet, 2008):

- Hands should be cleaned properly before patient contact.
- Hand hygiene performed before aseptic task.
- Hand hygiene performed after contact with body fluid.
- Hand hygiene is important after patient contact.
- Healthcare providers should clean their hands after contact with the environment which surround the patient.

figure (4.1): Hand washing process from Carol R. Taylor *et al*.,2011

2.3.2.a. Hand Hygiene Methods:

Hand hygiene strategies which suggested by CDC,2002, include the following:

• If hands are not visibly dirty after contact with bodily fluid, excretions, mucous membrane, non-intact skin, or wounds dressings.

• After touch with a patient's exposed skin.

• When shifting from a polluted to a clean bodily place in patient care.

• After coming into contact with inert items in the near surroundings of the patient.

• Prior to caring for patient who have severe neutropenia or others types of immune deficiency.

· When putting central catheters, put on sterile gloves first.

• Prior to the insertion of urinary catheter or other non-surgical devices. •After removing gloves.

Hand washing:

• When hands are clearly filthy or have been polluted with biologic materials from patient's care.

• When medical personnel are unable to accept a waterless alcoholic product (CDC,2002).

2.3.3. Infection control measures:

Although the healthcare environment includes a varied variety of microorganism, only a handful of them represent important infections for people who are sensitive. Microorganisms are abundant in damp, organic settings, although some may survive in dry environments as well. Despite the fact that pathogenic microbes may be found in the air, water, and on fomites, determining their function in infections and illness is challenging (CDC, 2003). The danger of hospital-acquired infections (HAIs) persists despite advancements in the healthcare system. According to the CDC, an estimated 1.7 million infection occur in hospital in the U.S each year, with 99,000 fatalities (Scott,2009).

The costs of HAIs was projected to be $4.5 billion in 1992 by the Study on the Efficacy of Nosocomial Infection Control (SENIC), and after inflation, it was expected to be $6.65 billion in 2007. HAI control has lately been a global concern, resulting in a development of infections prevention and control measures (Yokoe *et al*.,2014).

Although infection control rules have been created, HAIs continue to be unavoidable due to a lack of controls over their execution. The growing incidence of healthcare-associated infections (HAIs) is currently considered one of the most severe issues facing healthcare systems throughout the worldwide (Allegranzi *et al*.,2011).

HAIs, often known as "nosocomial" or hospitals infection, are illnesses that develop two days after a patient is admitted to the hospital (Bello *et al*.,2011).

According to WHO, HAIs are present in 15percent of the world's population (Sydnor *et al*.,2011). The proportion of HAIs in Europe is 6 percent, with prevalence estimates ranging from 5.7 percent to 19.1 percent in emerging and East Mediterranean nations. HAIs affect the urinary tract, respiratory system, surgical wound, and bloodstream in more than 80percent of cases (Plachouras,2018). As a result of following up on the complications caused by HAIs, patients experience delayed recovery, longer hospitalization (e.g., more than 4 days related to urinary tract infection and up to 1 month in blood stream infection), increased healthcare cost for patient and the healthcare system, and increased suffering for patients' families (Brosio *et al*.,2017). The WHO and the CDC have advocated two ways to limiting infections, based on the importance, cost, and occurrence of HAIs in various hospital wards: standard measures and transmission-based precaution (Al-Rawajfah *et al*.,2015).

Standard precaution relate to the fundamental principles of infection control used to safeguard healthcare workers against HAIs. Hand cleaning, protective barriers (glove, mask, gun, and protective goggles), sharp object management, and patient-associated care tool management are all examples of these measures. Indeed, these are the bare minimums for ensuring health-care safety in every ward, regardless of disease kind or severity. When traditional precautions are insufficient to control infections, transmission-based measures are applied (Ocampo *et al*.,2017).

At any one moment, between 5 to 10percent of patient who were admitted to acute care hospital in wealthy nations contract HCAI, while the infection risk is 2–20 times higher in underdeveloped countries (WHO, 2010).

It is a global health issue that is one of the leading reasons of high mortality and morbidity; longer hospitals / ICU stays; increased severity of the

underlying disease; elevated use of monitoring and treatment device; increased treatment costs in both developed and resource-poor countries; and diminished patients and family life quality (Uwaezuoke & Obu, 2013)

According to the Joint Commission (TJC,2011), provide a safe environment for the patient, family, and staff, infections control practices are critical. Infections prevention and control are primarily the responsibility of nurses. Because of decreased pathogen resistance, higher exposure to pathogen, some of which may be resistance to most medications, and invasive procedure, patient in all healthcare setting are at risk for infections. Direct contact with patients' blood, bodily fluid, and environmental contamination with surrounding surface, healthcare personnel are at risk of contracting infections. When giving direct care, its necessary to avoid transferring germs to patients and suffering an illness by using fundamental infections control practices procedures.

2.3.3.a. Modes of Transmission:

There are many types of transmission suggested by (White, 2010) include the following:

1- Contact Transmission:

The most important and frequent mode of transmission is contact transmission. This involves the transfer of an agent from an infected person to a host by direct contact with the infected person, indirect contact with the infected person through a fomite, or close contact with contaminated secretions.

2- Airborne Transmission:

When a vulnerable host comes into touch with aerosol droplets or dust particles floating in the air, airborne transmission can occur. The amount of time

an organism may stay airborne is influenced by particle size. The longer the particles is hung, the more likely it is to locate an open doorway into the human host.

3- Vehicle Transmission:

When an agent is transmitted to a vulnerable host through contaminated inanimate things such as waters, foods, milk, medications, or blood, it is known as vehicle transmission.

4- Vector-Borne Transmission:

When an agent is transmitted to a vulnerable host by living methods like mosquito, lice, ticks, fleas, and other animals, it is known as vector-borne transmission.

2.3.4. Medication safety:

Every health care provider has the same purpose in mind: to keep patients safe. Medication mistakes are one of the most serious safety concerns. Because of the potential for patient harm, it is an essential indication of the healthcare delivery system (Benjamin,2003)

Patients safety is a top concern for many health organizations throughout the world, and it's a key component of providing high-quality treatment. Medication is an important part of patient's safety, and it's been used as a key indication of health care quality (Murphy & APR,2014)

In recent decade, several studies have identified pharmaceutical safety as one of the most serious dangers to patient's safety in hospital (Hicks *et al*.,2004). In Malaysia, 2572 incidences of medication-related adverse events were recorded in 2009, and it was highlighted as a major adverse event concern

affecting patient outcomes (Maziah *et al*.,2012). It has major direct and indirect repercussions, and is frequently the outcome of a collapse in a care system. Not only does it result in death or disability, but it also has an emotional impact on the sufferer. In the United States of America, medical mistakes affect an estimated 1.5 million individuals and kill a few thousand each year (Hariati Johari, 2013)

Patients in critical care units receive more medications than those in other units. Patients are unable to monitor and report drug side effects owing to sleepiness or unconsciousness; hence, due to the complexity of care, severe disease, and giving life-sustaining therapy, patient in this unit are particularly prone to medication mistakes (Abusaad *et al*.,2015). Patients in these specialized units are subjected to an average of 1.7 mistakes each day, with pharmaceutical errors accounting for 78percent of life-threatening errors. Medication mistakes can be mild, severe, or life-threatening, resulting to death (Manias *et al*., 2012). Medication errors are defined as any preventable incident that may result in the incorrect use of medicinal product or harmful consequences in the patient (Manias *et al*., 2012). Medication mistake is a multifaceted and complicated problem. Errors can occur at any stage of the medication preparation and distribution process, and they can be linked to healthcare workers' performance, medicinal products, the system, and processes like order communication, prescribing, labelling, packaging, compounding, dispensing, distribution administration, nomenclature, monitoring, and education (Roughead *et al*., 2013).

Medication mistakes are one of the most prevalent types of occurrences in critically sick patient, especially during the prescription and administration phases. Despite the fact that the majority of such instances have no clinical

repercussions, a considerable fraction has been proven to be damaging to the patient, and a big percentage is preventable (Kiekkas *et al*.,2011). A comprehensive review of research on medication mistakes in Middle Eastern nations found that there were very few studies on medication errors, and that inadequate understanding of medications was a contributing factor in both prescribers and nurses providing prescriptions. To that end, these countries must rapidly implement educational program aimed at boosting the expertise of nurses in order to enhance medication administration quality (Alsulami *et al*.,2013).

The complete medicine usage process is considered in a holistic view of safety barriers, which represents the interdependencies across all process steps. While the notion of error chains has been employed in incident studies in the past, it has yet to be implemented systematically in medication management. Surprisingly, scholars have just lately begun to employ comparable methodologies (Carayon *et al*., 2014).

2.3.4.a. Standards:

Actions that guarantee safe nursing practice are known as standards. Individuals healthcare organizations and the nursing profession define the standards for drug delivery. Professionals apply to the task of administering medications. Follow the 6 rights of medication administration every time when deliver drugs to avoid medication mistakes. Many drug mistakes can be traced back to a lack of consistency in following these six rules:

1- Right Medication:

For every drug that provided to a patient, it must first get a medication order. Prescribers may write instructions in the patient's medical record by hand. Many

organizations, on the other hand, employ electronic provider order input (CPOE). Prescribers can use CPOE to order prescriptions electronically, reducing the need for printed orders and improving medication safety (Sowan *et al*., 2010).

2- Right Dose:

The unit-dose method was created to reduce mistakes. The risk of mistake rises when a drug is prepared in a higher amount or strength than required, or when the doctor prescribes a measurement system that differs from what the pharmacy provides. When calculating or converting drug dosages, have another competent nurse double-check (Mohmmed& El-sol,2017).

3- Right Patient:

Medication mistakes can arise when a patient receives a medicine that was prescribed for someone else. Make sure when deliver the proper drug to the right patient is a critical step in safe pharmaceutical administration. It's tough to recall each patient's name and appearance. Use at least 2 patient's identities before providing a drug (TJC, 2010).

4- Right Route:

If an order does not specify a method of administration, always consult the prescriber. In the same way, if the prescribed route is not the suggested route, notify the prescriber right once. Medication mistakes using the improper route are prevalent, according to new research. Because liquid drugs are usually given orally, enteral and parenteral medications, for example, are at risk of causing confusion in children. There is a substantial danger of providing an oral drug through the parenteral route when it is prepared in parenteral syringes (Paparella, 2008).

5- Right Time:

It's also important to understand why a drug is prescribed at specific times of the day and whether it may be changed. Two drugs, for example, are prescribed, one q8h (every 8 hours) and the other three times a day. Both drugs should be taken three times in a 24-hour period. The q8h medicine will be administered around the clock by to maintain therapeutic blood levels of the drug. The nurse, on the other hand, must provide the 3-times-a-day medicine during waking hours. For prescriptions ordered at regular intervals, each agency has a suggested timing plan. If necessary or appropriate, nurses can change these recommended timeframes (ISMP, 2011).

6- Right Documentation:

Nurses and other health-care professionals require precise documentations to communicate with others. Inaccurate paperwork is the cause of many pharmaceutical mishaps. Always correctly document drugs at the time of administration and double-check any faulty paperwork before administering prescriptions (Paparella, 2016).

2.3.5. Positioning:

After the patients has lost consciousness and reflex, the patient is put in a precise operational posture. To avoid changes in integumentary, respiratory, circulatory, and neuromuscular function, patients' safety, comfort, and body alignments in positions should be assured (Rothrock, 2007).

It's crucial to keep a patient in the right position in bed to avoid bed sore, foot drop, and contractures. Patient who are bedridden or have restricted movement due to a medical condition or therapy benefit greatly from proper placement. Supportive equipment such as pillow, rolls, and blanket, as well as

repositioning, can help provide comfort and safety while situating a patient in bed (Potter *et al*., 2014).

Changing a patient's posture is one of the most common operations performed by health care personnel in long-term care facilities. After a while, any posture becomes uncomfortably unpleasant, then excruciating. While the independent person can take on a wide range of roles, the dependent person's options may be limited. Residents who are unable to freely move their limbs to change positions or who are partially or completely reliant on the nursing staff due to injury or sickness should be shifted on a frequent basis. Changing the posture of the dependent resident at least every two hours accomplishes four goals which documented by (Kozier, B., Erb *et al*.,2004) :

a) improves the resident's comfort;

b) relieves pressure on afflicted regions;

c) helps avoid contracture or deformity; and d) improves blood circulation.

In the ICU, critically sick patients are frequently placed on severe bed rest, if not full immobilization by pharmacological or mechanical methods. Decubitus ulcer, venous thrombosis, and pulmonary dysfunction like atelectasis, residual secretion, dysoxia, pneumonia, and aspiration have all been extensively described in the medical literature as side effects of immobility. One of the nursing methods in the management of critically sick patient has been to move them from the supine position every 2 hours in order to prevent these well-known and rather common problems. Since then, the medical literature has produced some compelling evidence supporting the benefits of body position adjustments in postoperative treatment, and regular patient rotation every two

hours is becoming the nursing standard treatment for all immobilized and critically sick patient (Krishnagopalan *et al*., 2002).

All intensive care patient must be rotated from their backs to their sides on a frequent basis, and two hourly positioning has been considered as a standard of care (Marik PE, Fink MP,2002).

Patients are also routinely placed in a head-up posture, unless contraindicated. In patient with severe respiratory failure, positioning treatment, particularly the prone position, is also utilized to promote oxygenation (Thomas *et al*.,2007).

There are specialized beds that will turn patient on a regular basis and are effective in the treatment and prevention of respiratory issues. Despite the fact that patient posture is an important aspect of normal intensive care management, little is known about what happens in actual practice. The information that has been published implies that patients may be able to stay in one posture for long period of time (Schallom *et al*.,2005).

2.3.5.a. Poor body alignment:

Poor body alignment may be including the following points suggested by (Anders *et al*.,2010):

1. The resident's neck and chest are contracted, which reduces chest expansion for breathing. Respiratory infections are more likely as a result of this. The capacity of the resident to swallowing may also be harmed.

2. The arms are curled up toward the chest, putting tension on the shoulder muscle and producing wrist flexion.

3. There's really no supports in the lower back, which can lead to back hyperextension. The abdomen and back muscles may be strained as a result of this hyperextension.

4. Coccyx pressure raises the risk of pressure sores in this part of the body.

5. Because the knees are not supported, muscle tension in the knees might result.

6. The feet are in a hyper-extended position. Because to foot drop, this may cause difficulty with ambulation in the future.

2.3.5.b. Pressure on the Skin:

One of the most essential reasons for shifting the resident's posture is to relieve pressure on various body regions and prevent pressure zones from forming. The pressure from the supporting surface on the blood vessels, skin, and underlying tissues increases the longer the resident stays in the same posture. Because these structures are not stiff, they flat and become more compacted as a result of pressure. If the pressure is not relieved, pressure ulcers will develop. The skin is most typically impacted over bony prominence (where the skin has less fat to protect it from the bones (RNAO,2005).

2.3.6. Personal protective equipment's:

Healthcare workers (HCWs) still fail to adhere to standard precaution guidelines despite evidence that such a failure increases the risk of mucocutaneous blood and body fluid exposure resulting in blood-borne infection (BBI) (Ferguson *et al*.,2004)

Direct transfer of germs is the most common cause of HAI. As a result, health-care personnel are at a significant risk of contracting infections at the

hospital or spreading diseases to patients or coworkers. Furthermore, due of repeated direct contact with carrier or patient of infectious illnesses, as well as repeated exposure to patient's sample and infected surgical devices, the environment, and air, healthcare professionals constitute a group at high risk of infection (Zellmer *et al*., 2015).

As a result, health-care employees' safety becomes a priority, and availability to personal protective equipment (PPE) is a major problem (Black *et al*., 2020; Poonian *et al*., 2020)

Correct use of PPE by healthcare worker is critical to reducing the risk of HAI transmission through healthcare employees (Jones *et al*., 2020). Despite wearing PPE, the risk of skin and medical garment contamination can increase due to carelessness when removing contaminated PPE; as a result, accurate personal PPE use is an important strategy for protecting healthcare personnel from contamination and preventing pathogen transfer to following patient (Reddy *et al*., 2019).

PPE is a type of protective gear or equipment worn to defend against infectious agents. Nurses require a great deal of personal protective equipment. Cleaning of body fluid, injections / blood sampling, catheter insertion, wound dressing, and other tasks performed by the nurse have a significant risk of infection transmission. If PPE is not provided in line with established regulations, infectious illnesses may be transmitted to both patient and the health personnel (Elizabeth *et al*,2009).

Infection prevention in hospital settings relies heavily on the appropriate use of PPE by health care workers (HCWs). PPE (such as gown, glove, and mask) protect HCWs from infectious agent exposure and helps to avoid cross-

infection of other patients. However, how HCWs wear and removed PPE has an impact on its effectiveness, as evidenced by the recent Ebola virus disease (EVD) outbreak (Baloh *et al*.,2019).

2.3.6.a. According to (Valdez, 2015), the Environmental Protection Agency (EPA) has separated safety gear and respiratory protection into 4 groups: levels A to D:

Level A:

When the utmost amount of respiratory, skin, eyes, and mucous membranes protection is necessary, protection is worn. A self-contained breathing apparatus (SCBA) and a completely enveloping, vapor-tight, chemical-resistant suit with chemical-resistant gloves and boots are among the items required.

Level B:

Protection necessitates the most respiratory protection, but less skin and eyes protection than in level A conditions. The SCBA and a chemical-resistant suit are included at this level of protection, although the suit is not vapor-tight.

Level C:

Protection necessitates the use of an air-purified respirator, which removes dangerous compounds from the air using filters or sorbent materials. Level C protection includes a chemical-resistant coverall with splash cover, chemical-resistant glove, and shoes.

Level D:

Safeguarding is the standard work uniform.

2.3.6.b. Personal protective clothes:

a. Gloves:

Patients and health care workers can wear gloves to protect themselves from infectious materials on their hands. Gloves' ability to protect healthcare workers against blood borne transmission of infection (e.g., HIV, HBV, HCV) after a needlestick injury or other penetration that penetrates the gloves barrier has yet to be determined. Gloves can lower the amount of blood on the sharp's exterior surface by 46-86 percent. Infectious organism transmission can be decreased during patient care by following the concepts of working from "clean" to unclean, and restricting or limiting pollution to surface that are directly required for patient care. To avoid cross-contamination of body locations, it may be important to change gloves while caring for a single patient (Boyce,2002).

Gloves are put on last when used in conjunction with other PPE. Gloves that fit securely around the wrist are ideal when wearing an isolation gowns because they cover the gown cuff and offer a more consistent continuous barrier for the arm, wrist, and hand. Hand contamination can be avoided by properly removing gloves. Hand washing after glove removal guarantees that the hand is free of highly contaminated material that may have entered through unnoticed rips or contaminated the hand during gloves removal (Tenorio *et al*.,2001).

b. Isolation gowns:

Isolation gowns are used to cover the HCW's arms and exposed body parts, as well as to avoid contamination of clothes with blood, body fluid, and other infectious materials, as stated by Standards and Transmission-Based Precautions (Verbeek *et al*.,2020).

An isolation gown is used only if touch with blood or bodily fluid is expected when using Standard Precautions. When using Contact Precautions (i.e., to prevent transfer of a pathogens that is not interrupted by Standard Precautions alone and is linked to environmental contamination), donning both a gown and gloves upon entering the room is recommended to avoid accidental touching contaminated surfaces and equipment (Duckro *et al*,2005).

c. Masks:

Masks and goggles can be worn together to cover the mouth, nose, and eye, or a face shield can be used instead of a masks and glasses to give more comprehensive face protection. Infectious pathogens can enter through the mucous membranes of the mouth, nose, and eyes, as well as other skin surface if skin integrity is impaired (e.g., by acne, dermatitis). (Hosoglu and colleagues, 2003). As a result, using personal protective equipment (PPE) to safeguard certain body areas is a crucial part of Prevention Strategies. Masks have been shown to have a protective impact on exposed healthcare staff (Loeb *et al*.,2004).

d. Goggles, face shields:

The kind of protective eyewear (e.g., glasses or face shield) used in various work conditions is determined by the circumstance of exposure, additional PPE used, and personal visual demands. Eye protection must be comfortable, allow for good peripheral vision, and be adjustable to guarantee a secure fit. Personal eyewear and contact lenses are NOT considered suitable eye protection. It may be required to supply a variety of protective equipment kinds, styles, and sizes. Indirectly-vented goggles with a manufacturer's anti-fog coating may give the most dependable practical eye protection from different angles from splashes,

sprays, and breathing droplets. Newer goggles may have improved indirect airflow features to decrease fogging, as well as enhanced peripheral vision and a wider range of sizes to suit various employees (Phan,2019).

Precautions and the fact that eyewear are not required for this infection. Even though Droplet Precautions are not suggested for a particular respiratory tract infection, protection for the eye, nose, and mouth with a mask and eyeglasses, or a face shield alone, is required when it is anticipated that any respiratory secretion or other bodily fluids may be splashed or sprayed as outlined in Standard Precautions. Face shields, either disposable or non-disposable, may be used instead of goggles. In contrast to goggles, a face shield may protect other parts of the face in addition to the eyes. Face shields that reach from the chin to the crown give superior splash and spray protection; face shields that wrap around the sides may lessen splashes along the shield's edge (Siegel *et al*., 2007).

2.3.7. Sharpe safety disposal:

Health care workers (HCWs) such as medical doctors, nurses and laboratory staff are frequently exposed to infectious diseases. Some infectious diseases have no available vaccination or complete treatment, so blood-borne infections are a major cause of anxiety for HCWs. Globally, about 35 million HCWs face the risk of sharps injuries (SIs) from contaminated sharp objects every year.(Honda *et al*., 2011).

In particular, nurses were most likely to have needle stick injuries (NSIs) among HCWs. Nursing staff face with the risk of SIs in a wide range of situations, but continuous education and adequate training for nurses may lead to reduction of potential hazards in their routine work (Muralidhar *et al*.,2010).

Needle stick and sharp injuries (NSSIs) are described as a penetration or wound on the body surface caused by needle or sharp edge objects that may have been contaminated with bodily fluids, primarily blood. NSSIs are a significant occupational risk for healthcare professionals (HCWs), such as nurses and midwives. These HCWs often employed needle and sharp objects to perform various operations in health facilities, putting them at risk for a variety of accidents (Prüss *et al*., 2005).

Needles injuries happen:

• during use

• after use, before disposal

• between stages in processes

• during disposal

• during resheathing or recapping a needle, according to statistics from the Health Protection Agency (HPA, 2012) and the CDC (CDC, 2010).

Some procedures are more likely than others to result in a sharps injury. Intravascular (IV) cannulation and venipuncture are two examples. The following devices are used in high-risk procedure:

• IV cannula

• hypodermic needle and syringe

• phlebotomy needle

• winged steel needle (also recognized as butterfly needle)

• Sharp injury may be caused by lancet, scalpel, sutures needle, razors, scissor, test tube, and even bone pieces or patients' tooth.

The collection and correct disposal of bio - medical waste has become a major problem for both the medical community and the general public. Every concerned health staff is required to have sufficient knowledge, practice, and ability to advise for others waste management in the country, as well as suitable handling practices, since the establishment of the biological Waste Management Rules in 1998. (Pinto,2014).

Devices involved in these high-risk procedures are IV cannula ،winged steel butterfly needles ،needles and syringes phlebotomy needles. The nurses must take the following steps, according to (Ducel *et al*.,2002): • Sharps should not be transmitted from hand to hand.

• The amount of handling is maintained to a bare minimum.

• Before use or disposal, the needle is not fractured or bent.

• Syringe or needle are not disassembled by hands and are discarded in one piece.

• Needle are never re-sheathed after being used.

• Employees are responsible for any sharp they use and disposed of them in a designated container at the time of usage.

• Sharp container are not more than two-thirds full and kept in a secure location away from the general public.

Sharps are disposed of at the point of use in sharps trays with inbuilt sharps bins. Sharp box is signed on installation and disposal. Sharps are kept securely away from the general public and out of hands of children. Employees are aware of

the policy regarding inoculation-related injuries. Examples include no re-capping, placing sharps containers at eye level and at arms' reach, checking sharps containers on a schedule and emptying them before they're full, and establishing the mean for safe handling and disposing of sharp device before beginning a procedure (Susan *et al*., 2004).

2.3.8. Bed side rails:

Side rails have been used to prevent falls from hospital beds for more than 50 years. Since the 1970s, health care facilities have had side rails on virtually all beds and written policies for the routine use of side rails with all clients. Side rails may be full length, half length, or one-third length. Clients use side rails to help turn from side to side in bed or to sit up on the edge of the bed and as a support when standing. Some clients feel more secure in a strange bed and environment with the side rails up(CDC,2008). Bed rails are movable steel or stiff plastic bars that connect to the bed and come in a range of forms and sizes, ranging from full length to half, quarter, and eighth (Bed & Workgroup, 2003).

Patients with forgetfulness, sleeping problems, incontinence, pain, uncontrollable physical movement, or who get out of bed and walk recklessly without assistance should be carefully investigated to find the best ways to keeping him safe from harm, such as falling. The patient's medical team will examine the situation in order to determine the best course of action for keeping the patients safe. In the past, physical constraint was used in health care facilities to keep patients safe. In recent years, the medical establishment has recognized that physical constraint of patients is hazardous. Regardless of the fact that bed rails are not meant for this function, they are sometimes used as restraints. Regulatory authorities, healthcare organizations, product manufacturers, and

advocacy groups urge hospitals, nursing homes, and home care providers to assess patients' needs and provide safe treatment without restrictions (Palese et al.,,2021).

2.3.8.a. The Benefits and Risks of Bed Rails according to (Sanjita *et al*.,2008):

• Turning and repositioning inside the bed are made easier with the use of bed rails.

• Assisting in getting into and out of bed by supplying a handhold.

• Creating a sense of security and comfort.

• Reducing the likelihood of patient slipping out of bed during transit.

• Making bed control and personal care products easily accessible.

2.3.8.b. Potential risks of bed rails may include according to (Sanjita et al.,2008):

• Patient or parts of their bodies trapped between rails or between the bed rails and mattress might be strangled, suffocated, or experience severe harm or death.

• Patients who climb over railings get more catastrophic injuries from falls.

• Bruising, wounds, and scratches on the skin.

• When bed rails are employed as a constraint, it might cause agitated behavior.

• Feeling alone or confined needlessly.

• Preventing patients who can get out of bed from conducting everyday tasks like going to the restroom or getting something from the closet.

2.3.9. Disinfection and sterilization:

Medical and surgical tools must be disinfected and sterilized to prevent infectious microorganisms from being transmitted to patients. Because sterilization of all patient-care equipment isn't required, health-care regulations must determine if cleaning, disinfection, or sterilization is required, based mostly on the products' intended use. Several investigations in a variety of nations have shown that set disinfection and sterilization criteria are not followed. Numerous epidemics have resulted from failure to follow scientifically grounded standards. The approach focuses on well-designed study evaluated the effectiveness (through laboratory testing) and efficiency (through research trials) of disinfection and sterilization procedures; the guidance introduces a practical approach to the judicious selection and appropriate use of aseptic technique and sterilization processes (Mehta *et al*.,2005). With the exception of bacterial spores, disinfection refers to the removal of many or all germs from inanimate items (Rutala and Weber, 2009).

2.3.9.a. Chemical disinfection:

Chemical disinfection is accomplished by mixing a disinfectant (usually a powerful oxidant) into the water, which interacts with organic materials and microbiological organisms. Chlorine dioxide, chloride, and chloramines, on the one hand, and ozone, on the other, are the most common chemical disinfection chemicals. Chemical disinfection effectiveness may be reduced depending on the water, for example, with higher pH when employing chlorine or with high organic matter concentration. Chemical disinfection may also produce byproduct resulting from oxidative processes. Some of them may have negative health consequences. (Stroheker *et al*., 2014).

These levels of disinfection suggested by (McDonnell,2011)are as follow:

1- High-level disinfection (HLD):

All viruses, fungus, vegetative bacteria, mycobacterium, as well as some, not all, bacterial spore are destroyed in this process.

2- Intermediate-level disinfection:

All mycobacteria, fungal spore, vegetative bacteria, and certain nonlipid viruses are destroyed, but bacterial spore are not destroyed.

3- Low-level disinfection:

A technique that may eliminate most bacteria, virus, and fungi (excluding mycobacteria and bacteria spore). Although this classification for disinfection levels is still relevant in most cases)

Another classification system has been given:

1-Critical Items:

If a critical object is infected with any microbe, including bacterial spores, it poses a significant danger of infection. Since a consequence, things entering sterile tissue or the circulatory system must be sterile, as any sources of contamination might result in transmission of infection. Surgical equipment, cardiac and urinary catheter, and implants utilized in sterile bodily cavities fall within this group (FDA,2015).

2- Semicritical Items:

Items that come into touch with mucosal membrane or non-intact skin are considered semicritical. This category includes GIT endoscope, bronchoscope, laryngoscope, endocavitary probe, prostate biopsy probe,

cystoscopy, hysteroscopy, infrared coagulation device, and diaphragm fitting rings, as well as respiratory treatment and anesthetic equipment (Rutala et al.,2016).

3- Noncritical Items:

Item that come into touch with intact skin but not mucosal membrane are classified as noncritical. The sterility of goods coming into touch with skin contact is "not crucial" since intact skin serves as an efficient barrier to most pathogens. Bedpan, blood pressure cuff, crutches, bed rails, linen, bedside table, patient's furnishings, and flooring are example of noncritical goods (Weber *et al*.,2010)

Classification of Chemical Disinfectants:

1- Alcohols:

Alcohol and alcohol plus Quaternary ammonium action based compounds comprise a class of proven surface sanitizers and disinfectants approved by the environmental protection agency (EPA) and the Centers for Disease Control for use as a hospital grade disinfectant. Alcohols are most effective when combined with distilled water to facilitate diffusion through the cell membrane; 100% alcohol typically denatures only external membrane proteins(CDC,2016).

2- Aldehydes Examples:

formaldehyde, glutaraldehyde Aldehydes are highly effective, broad spectrum disinfectants, which typically achieve sterilization by denaturing proteins and disrupting nucleic acids. The most commonly used agents are

formaldehyde and glutaraldehyde. Aldehydes are effective against bacteria, fungi, viruses, mycobacteria and spores(Morley,2002).

3- Chlorine:

Chlorine compounds: (Sodium hypochlorite as liquid known as household bleach or calcium hypochlorite found as granules). Considered as intermediate to high-level disinfectant, hypochlorite inexpensive. Fast-acting disinfectants that approach high-level standards but are limited in application because of inactivation by organic matter, corrosiveness to metal, and instability. Very useful for spot cleaning of blood spill (1:10 dilution of household bleach). Chlorine has been used for applications, such as the deactivation of pathogens in drinking water, swimming pool water and wastewater, for the disinfection of household areas and for textile bleaching (Rybka,2021).

4- Iodophors:

Iodine solution or tincture have long been utilized as antiseptic on skin and tissue by medical experts. On the other hands, iodophors have been utilized as both antiseptics. Any liquids chemical sterilant or high-level disinfection using iodophors as the major active component has not been approved by the FDA. Iodophors are a mixture of iodine and a solubilizing agent or carrier that offers a long-term iodine reservoir while also releasing modest quantities of free iodine in aqueous solution (Gottardi,2001).

5- Peracetic Acid and Hydrogen Peroxide:

is a strong oxidant that long has been used in industrial applications and in water treatment processes. When catalyzed in water, hydrogen peroxide may

generate a wide variety of free radicals and other reactive species that are capable of transforming or decomposing organic chemicals. Manufacturer data demonstrated this combination of peracetic acid and hydrogen peroxide inactivated all microorganisms except bacterial spores within 20 minutes. The 0.08% peracetic acid plus 1.0% hydrogen peroxide product effectively inactivated glutaraldehyde-resistant mycobacteria (Petri *et al*.,2011).

6- Phenolics:

Since its first application as a germicide by Lister in his groundbreaking work on antiseptic surgery, phenol has had a significant position in the area of hospital disinfectant (Rutala & Weber, 2015).

7- Quaternary Ammonium Compounds:

Disinfectants containing quaternary ammonium compound are extensively utilized. Contaminated quaternary ammonium compound that used sterilize patient-care supplies or equipment, like cystoscopy or cardiac catheter, have been linked to healthcare-associated illnesses. The quaternaries are effective cleaning agent, although high water hardness and material like cotton and gauze pads might reduce their microbicidal effectiveness due to insoluble provokes or the active components being absorbed by cotton and gauze pads, correspondingly. (Rutala & Weber, 2013).

2.3.9.b. Sterilization:

The majority of surgical and medical equipment used in health care institution are composed of heat-stable materials that are sterilized using heat, typically steam. Furthermore, since 1950, there has been a growth in medical equipment and instruments constructed of low-temperature serializable

materials (e.g., plastics). Since the 1950s, ethylene oxide gas has been employed in medical equipment that are heat and moisture sensitive. Several innovative low-temperature sterilization technologies (e.g., peracetic acid immersion, hydrogen peroxide gas plasma, ozone) were created and are being utilized to sterilize medical equipment in the last 15 year. This section examines sterilizing techniques used in health care and offers suggestions on how to get the best results from them while processing medical equipment (AORN,2006).

1- Heat Sterilization:

The most efficient and extensively used type of sterilization is heat sterilization, which produces bactericidal action by destroying enzymes and other key cell elements. Thermostable items may be sterilized using this approach. It may, however, be used on both moisture-sensitive and moisture-resistant items, using dry (160–180°C) and wet (121–134°C) heat sterilization processes (Alkadhim,2018).

a- Steam Sterilization:

Steam sterilization is usually done between 10 and 60 minutes at temperature between (121C,250F) and (134C,273F), at 15 psi (0.5 bar) pressure, and at temperatures between (121C,250F) and (134C,273F), depending on the material. The longer the exposure period necessary for sterilization, the lower the temperature. Because multiple-use devices are sanitized after each use, they are subjected to many sterilization cycles. Materials utilized in these equipment should be able to resist the device's required number of cycles while still maintaining performance, security, and efficacy (Sastri, 2014).

b- Hydrogen Peroxide Gas Plasma:

In 1987, a new plasma-based sterilizing method was developed and commercialized in the U.S. Gas plasmas are known as the 4th state of matter (i.e., liquid, solid, gas, and gas plasma). As a result, sterilized goods may be securely handled, whether for rapid use or storage. The method has a temperature range of 37-44°C and a 75-minute cycle duration. If there is any moisture on the items, the vacuum cannot be produced, and the cycle will be aborted (Rutala & Weber, 2013).

c- Dry Heat Sterilization:

Dry heat is used to sterilize material which can be steam sterilized due to steam damage, lack of penetration, or the inability to disassemble tools. Sterilization involves the following steps: 170°C (340°F) for 60 minutes 160°C (320°F) for 120 minutes 150 minutes at 150 degrees Celsius (300 degrees Fahrenheit) 121°C (250°F) for 12 hours Gravity or mechanical convection is used in hot air ovens. Because of their better resilience to dry heat, B. subtilis spores must be utilized as a biological indicator (Louisiana, 2011).

2- Chemical Sterilization:

Chemical sterilization is extensively practiced for sterilizing the food contact surfaces. In order to deliver the packaging material and contact surface commercially sterile, chemicals are used to kill bacterial forms (vegetative cells and spores), yeast, and molds (Chavan *et al*., 2016).

a- Ethylene Oxide (EtO) Ethylene oxide (EtO):

Since the 1950s, has been frequently utilized as a low-temperature sterilizing agent. Ethylene oxide sterilization is often used on temperature-

sensitive and moisture-sensitive material and electronics. For sterilization, EtO is available in three main forms: 100percent EtO, 10percent EtO, and 90percent hydro-chlorofluorocarbon (HCFC), as well as 8.6percent EtO dissolved in 91.4 percent carbon dioxide (CO2). Ethylene oxide gas is a highly flammable, explosive, and alkylating agent. As a result, it is classified as a hazardous and probably carcinogenic gas by the US Environmental Protection Agency (EPA), and exposure to EtO is restricted by the EPA and the Occupational Safety and Health Administration (OSHA). Protein may interact with ethylene oxide, causing them to denaturize.

Biological markers are used to assess the effectiveness of EtO sterilization. Parametric release techniques have recently been devised to assess the efficacy of EtO sterilization. By monitoring the microorganisms in the biological indicators, parametric release eliminates the requirement to submit the biological indicator to a laboratory facility to check sterilization levels.

• The following variables affect ethylene oxide sterilization:

• Temperature of the chamber,

• Relative humidity of the chamber,

• Gas concentration,

• Time of exposure to the gas,

• Material compatibility with EtO and permeability of packaging material to EtO, and

• Microorganism types (Mendes *et al*.,2007).

b- Cold Chemical sterilization:

Sterilizing objects that cannot be subjected to steam is done with cold chemical sterilization, which is a common and inexpensive method. Glutaraldehyde is the most often utilized chemical. Metal and delicate tools such as endoscopes are not corroded by a 2percent glutaraldehyde solution. The amount of time spent immersed in the solution varies depending on the object. Before used on a patient, items should be properly washed with sterile water (Anonim, 2011)

2.3.9.c. Cleaning:

Cleaning is the process of removing foreign material (such as dirt and organic matter) from items, which is usually done with water and detergents or enzymatic treatments. Because inorganic and organic elements that persist on the surface of equipment interfere with the performance of these operations, thorough cleaning is essential before high-level sterilization and disinfection. Furthermore, if contaminated material dry or bake onto tools, removal becomes more difficult, and disinfection or sterilization becomes less effective or ineffectual. Presoaking or rinsing surgical tools is recommended to prevent blood from drying out and to smooth or eliminate blood from the equipment. In areas where mechanical equipment (like ultrasonic cleaners or washer-disinfectors) are unavailable, or for fragile or difficult-to-clean instruments, cleaning is done by hand. The two most significant parts of manual cleaning are friction and fluidics. A tried and reliable method is friction (for example, rubbing the unclean area with a brush). When a brush cannot flow through a channel due to the design, fluidics (i.e., fluid under pressure) is used to remove dirt and debris from the inside channel after brushing. When using a washer-disinfector, use caution when loading the machine: hinged equipment must be

fully opened to provide proper contact with the detergent; stacking of device in the washer must be avoided; and devices must be removed as often as feasible. (Rutala & Weber, 2013).

Theoretical framework:

One of the first nurses to record the influence of the built environment on patient was Florence Nightingale. Nightingale recognized that, in addition to cleanliness, rates of infection, and ventilation, ambient factors such as color, noise, and light, as well as the nurse's presence, had a substantial impact on health results. Nightingale was clearly aware of the influence of the architectural environment on patient—she understood this from personal experience. In reality, she based all of her claims on her keen observation of patients or community results and their environs. Nightingale's environmental theory may be thought of as a systems model with the "client" in the center, surrounded by balanced parts of the environment. If one aspect is out of balance, the client will be stressed, and it will be up to the nurse to restore balance to the client's external environment in order to ease the tension (Lobo, 2011).

In the Nightingale nursing philosophy, the environment is the overarching notion. Her argument was that the environment might be changed in such a way that natural laws would enable healing to occur. This arose from her observation that bad or unpleasant settings were associated with poor health and sickness. The classic example occurred during the Crimean War, when squalor, poor nourishment, bad water, and improper sewage disposal resulted in more British troops dying in hospitals than from combat wounds. Food, drink, and drugs were just as important to Nightingale as those that directly influenced the exterior being, like oxygen, light, noise management, stimulus, and room temp. The most vital of these aspects, according to Nightingale, was ventilation.

This reflects the atmosphere in Victorian England, when air quality was often bad, particularly in metropolitan areas owing to coal combustion. Because it was widely believed that night air may induce sickness, dwellings were kept securely locked, resulting in inadequate air circulation and recurrent pollution (Selanders, 2010). For decade, safety was a top priority in many industries (Wilson *et al*., 2005).

Previous study

First study:

"Assessment of Nurses' Knowledge and Practices Regarding the Application of Safety Standard Precautions in Pediatric Critical Care"

(Adly *et al*., 2020)

Understanding and executing the standards of safety measures aims for children's safety to prevent dangers and mistakes is critical for nursing staff. The purpose of this research was to examine nurses' knowledge and behaviors regarding the use of conventional safety measures in hospitalized children. According to the results of the research, two-thirds of the nurses surveyed had inadequate knowledge and more than half had incompetent practices when it came to applying safety standard safeguards in pediatric critical care units. They suggested that newly hired pediatric nurses get training on prevention strategies and at regular interval. In pediatric critical care, emphasize the need of nurses

Second study:

"Assessment of Nurses' Performance Regarding the Implementation of Patient Safety Measures in Intensive Care Units"

(Aziz Mamdouh *et al*., 2020)

The purpose of this research is to evaluate nurses' performance in terms of patient safety implementation in intensive care units by analyzing nurses' knowledge and effectiveness in terms of patient safety implementation in critical care units.

More than 50% of the participants in the research had inadequate knowledge and performance when it came to implementing measures of safety of patient. The hospitals must strengthen ICU safety design and function, as well as develop a strategy to guarantee that patient safety protocols are executed effectively in all ICUs, according to the recommendations. In order to generalize the findings, the research needs be performed on a wide scale and in diverse hospital settings.

Third study:

Effect of Management Program on Nursing Staff Leading Role and Compliance to Follow Safety Measures at Intensive Care Units

(Abdallah *et al*., 2019)

The objectives of this study is to determine the effect of management program on nursing staff leading role and compliance to follow safety measures at intensive care units. Study was conducted at all ICUs of Tanta Emergency Hospital. The total number of study sample was (n=100) nursing staff working in ICUs at Tanta Emergency Hospital, including charge nurses (n=30) and bedside nurses (n=70).

Nursing staff knowledge and practice on leading role and compliance to follow safety measures in ICUs at Tanta Emergency Hospital were low, change nurses leading role and bedside nurse's compliance practice improved after implementation of needed program. The study recommended that conduct regular training programs, workshops and seminars for nursing staff to refresh their knowledge, skills and experiences related to leading role and safety measures.

Fourth study:

"Effects of a multi-component educational intervention on nurses' knowledge and adherence to standard precautions in intensive care units"

(Gomarverdi *et al*., 2019)

The goal of this research was to see how a multi-component education program affected nurses' understanding and compliance with the SP standards in critical care units (ICUs). A cluster randomized trial was used in this small-scale investigation. The research included two ICUs, each of which was situated in a separate hospital. The multi-component teaching intervention was given to nurses in one ICU (n = 15).

The multi-component training interventions have shown early promise in improving ICU nurses' understanding and compliance with the SPs standards. The interventions are a viable method for developing successful continuing education programs for nurses who want to enhance their skills.

Fifth study:

"Occupational Health and Safety Measures in a Mortuary of a Private Tertiary Care Medical College Hospital, Bangalore"

Shashikumar *et al*., 2016, state that mortuary services are integral to the compendium of services provided by a tertiary health care center. Mortuary or Post-Mortem rooms have potential hazards and risks for the health personnel as well as attendants of the deceased. To identify existing practices and Occupational Health and Safety (OSH) measures in a Mortuary and to assess the use of PPEs among HealthCare Workers. Across sectional design selected to achieve the objectives.

Physical, biological, chemical, and ergonomic dangers were all present in the workplace for health care professionals. In the post mortem chamber, physical and environmental dangers were found to be highly widespread. Housekeeping tasks that are performed on a regular basis might help to lessen the risks. The usage of PPES in a consistent and accurate manner is not always followed. Compliance may be improved by regular education sessions, incentive, and monitoring.

Sixth study:

Assessment of Nurse's Knowledge about Safety Measures at Minia University Hospital for Gynecology and Pediatric.

Mohammed *et al* .,2011, stated that, nurses must educate in infection control and hospital safety measures to provide effective care associated with the complexities of current health care systems. Safety measures are essential to a safe, competent, skillful nursing practice and safe workplace, descriptive study design selected to assess the nurses' Knowledge about availability and importance of applicability of safety measures in the hospital. Obstetric and pediatric (100) nurse were selected.

The findings show that, high percentage of nurses approved that first aid kits are available and approved by physician the check for first aid kits frequently for its availability is not available but important. Nurses were well knowledge about the administrative safety and its importance. Provide an in-services education about hospital safety measures for nurses is recommended. improving their use of safety standard safeguards. In pediatric critical care, there is a continuous examination for the use of safety standard safeguards.

Chapter Three

Methodology

Chapter Three

Methodology

This chapter covers the research design and processes employed in the current study to assess the nurse's knowledge regarding safety measures at critical care units.

3.1. Study design:

A descriptive study cross-sectional design carried out in Al-Hilla teaching hospitals. The purpose of this study is to assess nurse's knowledge regarding safety measures at critical care units, this study carried out from the period between (19. Oct.2021 to 2. May.2022).

3.2. Administrative Permission:

After a seminar presentation attended by senior specialist faculty members, the scientific committee of Nursing College University of Babylon gave its clearance to perform this study. As a second phase, a process of obtaining ethical permission from a research ethical committee-college of nursing was completed (Appendix:-1). Another official clearance was received from the Ministry of Health-Babylon Health Office Development and Training Center, formal requests were sent out sequentially to the AL-Hilla teaching hospital and the Imam Al-Sadeq hospital to assist data gathering (Appendix:-2 and 3).

3.3. Ethical consideration:

A humanity face or respect of nurses personality as human is considered in the current study as issue of ethical consideration. The researcher follows

certain steps in order to achieve the ethical consideration and obtain permission from the nurse him/her-self:

1- Critical care unit nurses who agree participate in the study has given a written informed consent (Appendix:-4).

2- After explaining the purpose of the study, and explaining that all the information will kept secured used only of the study purposes.

3.4. Setting:

This study was conducted in the critical care units at Al- Hilla teaching Hospitals, which includes the following:

1. Imam Al Sadeq teaching hospital, this hospital established to receive Al-Hilla city citizen from (2015) the capacity of the hospital is about (400) beds, the critical care unit consist of (20) beds respiratory care unit and (16) beds coronary care unit.

2. Al – Hilla surgical teaching hospital, established to provide the health | services from (1972), the capacity of the hospital is (447) beds. The critical care unit consists of (12) beds.

3.5. Study sample:

Purposive non-probability of (150) nurses who representing approximately all nurses who involved in the direct care of patients admitted to the critical care units Al- Hilla teaching hospitals to assess nurse's knowledge regarding safety measures at critical care units in Al-Hillah teaching hospitals. The total sample were divided in to two hospitals:

1- Al – Hilla surgical teaching hospital, critical care unit: 39 male and 31 female nurses, 30 nurses were night shift and 40 nurses were morning shift.

2- Imam Al Sadeq teaching hospital the respiratory care unit contain 25 male and 25 female nurses, 30 nurses were night shift and 20 nurses were morning shift.

The coronary care unit contain 16 male and 14 female nurses ,16 nurses were night shift and 14 nurses were morning shift.

3.5.1. Inclusion Criteria:

The nurses who agree to participate in the study were selected related to the following criteria:

1- Working at critical care units.

2- Agree to involve in this study.

3- Presenting during the period of data collection.

4- Involving in direct contact with patients who admitted to the critical care units.

3.5.2. Exclusion criteria:

1. Marjan Teaching Hospital has been excluded because it is a reception center for patients infected with the Corona virus.

2. Nurses who participate in the pilot study.

2.6. Study questionnaire:

In order to achieve the objectives of the study special reconstructed questionnaire prepared after a comprehensive review of related literature in the field of interested phenomena. The questionnaire prepared in English and Arabic language (appendix:-5 and 6). The questionnaire divided into three parts and nine domains related to safety measures:

Part l: Demographic Characteristics:

Content the following items:(Age, gender, marital status, educational level, and residency)

Part ll: General Information: Consist of the following:

1- Period of Experience

2- Years of experience in critical care

3- Working shift

4- A tendency of special courses related to safety measures

Part III: Safety measures:

this part consist nine domain related to safety measures, the items distributed as the following:

1- First domain: Environmental safety included (7) items.

2- Second domain: Hand hygiene included (6) items.

3- Third domain: Infection control measures included (7) items.

4- Fourth domain: Medication safety included (5) items.

5- Fifth domain: Positioning included (7) items.

6- Sixth domain: Personal Protective Equipment included (6) items.

7- Seventh domain: safety sharp disposal included (7) items.

8- Eighth domain: Bed side rails included (5) items.

9- Nine domain: Disinfection and Sterilization included (5) items.

3.7. Rating and Scoring:

The rating and scoring system which selected to facilitate the tabulation of the data was Yes which take (2) and No which takes as (1).

3.8. The validity of questionnaire:

To determine the validity, content, and applicability of a questionnaire which designed to assess the nurse's knowledge regarding safety measures at critical care units in Al-Hillah teaching hospitals, two version of questionnaire in Arabic and English language were distributive among (9) expert who works as a faculty member in a (3) three college of nursing in University of Babylon, University of AL-Kufa and University of Bagdad. Their years of experience in the field not less than ten years. Changes are made after the expert's opinion and suggestions are reviewed to ensure that the questionnaire is clear and accurate (Appendix:-7).

3.9. Pilot study:

The pilot study was carried-out in Al-Hilla teaching hospitals between the period (22. Jan to 23. Jan.2022) including 15 nurses who work in the critical

care unit. The nurses who are participating in the pilot study were excluded from the original study sample, a pilot study was performed to achieve the following:

1- Assess the relevance and clearance of the questionnaire.

2- Estimate the proper time need to fill the questionnaire.

3- Calculate the reliability of the questionnaire.

3.10. Reliability:

Cronbach Alpha (split half) was used to determine the questionnaire's reliability. The reliability determined the quality of the tool; the better tool is the higher reliability calculated, the following is the formula demonstrates the dependability coefficient, as well as the alpha cronbach correlation value's (0.706), which is statically acceptable. This means that the questionnaire is extremely trustworthy.

$$\alpha = \frac{K}{K-1}\left[1 - \frac{\sum_{i=1}^{K} \sigma_{ii}}{\sum_{i=1}^{K}\sum_{j=1}^{K} \sigma_{ij}}\right]$$

3.11. Data Collection:

Data was collected using a questionnaire (Arabic version) by self- report method with nurses after the appropriate approvals were completed. To obtain oral agreement, the researcher introduced herself to the participants and explained the goal of the study. The participants fill out the form and provide an answer (nurses). The questionnaire was collected from the participants after they self-administered it on an individual basis. Approximately each self-report took (15 to 60) minutes, overall (150) nurses selected to participate in the study. Data collection carried out from (3.Feb to 21.Feb.2022).

3.12. Statistical method:

The statistical package (SPSS) version 26 is used to analyse the data of the research under consideration; descriptive and correlational techniques are used.

3.12.1. Descriptive statistics:

1- Frequency

2- Percentage

$$\% = \frac{\boldsymbol{Frequency}}{\boldsymbol{Sample\ Size}} x100$$

3- Standard deviation

4- Mean

$$M.S = \frac{\sum \mathrm{ri} = 1\mathrm{Fi}\,\mathrm{x}\,\mathrm{Si}}{\sum \mathrm{ri} = 1\mathrm{Fi}} x100$$

3.12.2. Inferential statistics:

1- Chi square

$$\chi^2 = \frac{\sum_{all\,i}(O_i - E_i)^2}{E_i}$$

2- Corrlation

3- Cronbach Alpha

$$\alpha = \frac{K}{K-1}\left[1 - \frac{\sum_{i=1}^{K} \sigma_{ii}}{\sum_{i=1}^{K}\sum_{j=1}^{K} \sigma_{ij}}\right]$$

<u>For Knowledge Questionnaire</u>

∑xi = sum of the "***1x Incorrect + 2x Correct***" for items.

1. Average score (M <1.5) is considered ***Poor Knowledge***.

2- Average score (M ≥ 1.5) is considered ***Good Knowledge.***

Chapter Four

Results

Chapter four

Results

This chapter will show the results of data obtained from a total (150) participant, the tabled data presented systematically according to the study objectives by tables and figure.

Table (1): Descriptive statistics of the sample of study in relation to their demographical data.

Variables		F	%
Age	20-30	142	94.7
	31-40	3	2.0
	41-50	5	3.3
	Total	150	100.0
Gender	female	70	46.7
	male	80	53.3
	Total	150	100.0
Marital status	single	67	44.7
	married	83	55.3
	Total	150	100.0
Educational status	Secondary school	11	7.3
	Diploma	54	36.0
	Bachelor	85	56.7
	Total	150	100.0
Residency	urban	54	36.0
	rural	96	64.0
	Total	150	100.0

This table demonstrate that the most of the sample of study 142(94.7%) were between (20-30) years of age group, 80(53.3%) were male nurses, 83(55.3%) of them were married, while the result shows that most of the participants 85(56.7%) were bachelor holder and 96(64.0%) were rural resident.

Table (2): Descriptive statistics of the sample of the study related to their employment characteristics.

Variables		Frequency	Percent
Period of Experience	≤10	142	94.7
	11-20	5	3.3
	21-30	3	2.0
	Total	150	100.0
Years of experience in critical care	one years	89	59.3
	2-4	40	26.7
	over 4 years	21	14.0
	Total	150	100.0
Working shift	evening	78	52.0
	morning	72	48.0
	Total	150	100.0
special courses related to safety measure	no	103	68.7
	yes	47	31.3
	Total	150	100.0

This table presented the fallowing results related to the employment characteristics, the higher percentage of the study sample 142(94.7%) were with less than 10 years in experience, 89(59.3%) were with one years of experience in the critical care, while most of the participants 78(52.0%) were working in the evening shift, related to training courses of the safety measures 103(68.7%) revealed that they didn't attend any courses.

Table (3.a): level of nurse's knowledge related to the environmental safety domain.

Items		Frequency	Percent	Mean	Sd , deviation	Assessment
1-The best way to maintain safety measures relative to helping a patient get into bed is to	incorrect	65	43.3	1.57	.497	Good
	correct	85	56.7			
	Total	150	100.0			
2-The critical care unit environment is very stressful for patients, families, and staff. What nursing action is directed at reducing environmental stress?	incorrect	131	87.3	1.13	.334	poor
	correct	19	12.7			
	Total	150	100.0			
3-Appropriate room temperature	incorrect	85	56.7	1.43	.497	Poor
	correct	65	43.3			
	Total	150	100.0			
4-Appropriate room humidity is	incorrect	124	82.7	1.17	.380	Poor
	correct	26	17.3			
	Total	150	100.0			
5-Most of the critical care unit should be consider as …… to prevent cross infection	incorrect	133	88.7	1.11	.318	Poor
	correct	17	11.3			
	Total	150	100.0			
6-Cleaning and disinfection should be performed	incorrect	79	52.7	1.47	.501	Poor
	correct	71	47.3			
	Total	150	100.0			
7-Nurses should report any burnt out light bulbs and leaking faucets in order to	incorrect	145	96.7	1.03	.180	Poor
	correct	5	3.3			
	Total	150	100.0			
Overall				**1.27**	**0.386**	**Poor**

"N= Number, % = Percentage, M.s.= Mean of score (1.5), Poor (mean == <1.5), Good (mean=≥ 1.5), S.d=Standard deviation"

This table shows that the level of the critical care nurses knowledge related to the environmental safety recorded poor for most of the items (1.27±0.386).

Table (3.b): level of nurse's knowledge related to the hand hygiene domain.

Items		Frequency	Percent	Mean	Sd , deviation	Assessment
1-The most adherence improvement of hand hygiene in health care facilities is	incorrect	102	68.0	1.32	.468	Poor
	correct	48	32.0			
	Total	150	100.0			
2-It is preferable to rub the hands with a solution containing alcohol for all the following clinical cases except	incorrect	97	64.7	1.35	.480	Poor
	correct	53	35.3			
	Total	150	100.0			
3-Healthcare workers are exposed to germs on their hands by doing the following accept	incorrect	142	94.7	1.05	.225	Poor
	correct	8	5.3			
	Total	150	100.0			
4-Hand hygiene refers to ... accept	incorrect	62	41.3	1.59	.494	Good
	correct	88	58.7			
	Total	150	100.0			
5-What should the nurse do if your hands touch the sink while you are washing your hands before giving care to the patient ?	incorrect	69	46.0	1.54	.500	Good
	correct	81	54.0			
	Total	150	100.0			
6-What is the main purpose of hand hygiene and hand washing?	incorrect	48	32.0	1.68	.468	good
	correct	102	68.0			
	Total	150	100.0			
Overall				**1.42**	**0.439**	**Poor**

"N= Number, % = Percentage, M.s.= Mean of score (1.5), Poor (mean == <1.5), Good (mean=≥ 1.5), S.d=Standard deviation"

This table shows that the level of the critical care nurses knowledge related to the hand hygiene recorded poor for most of the items (1.43±0.439).

Table (3.c): level of nurse's knowledge related to the infection control measures domain.

Items		Frequency	Percent	Mean	Sd , deviation	Assessment
1-Which activity would be best in preventing septic shock in the hospitalized client?	incorrect	119	79.3	1.21	.406	Poor
	correct	31	20.7			
	Total	150	100.0			
2-When caring for a patient with respiratory infection , what is the best way the nurses can limit the spread of infection?	incorrect	111	74.0	1.26	.440	Poor
	correct	39	26.0			
	Total	150	100.0			
3-Which of the following is NOT part of standard infection control precaution practice?	incorrect	125	83.3	1.17	.374	Poor
	correct	25	16.7			
	Total	150	100.0			
4-What action by the nurse is most important when performing addressing change using surgical aseptic technique ?	incorrect	27	18.0	1.82	.385	Good
	correct	123	82.0			
	Total	150	100.0			
5-Before applying iv cannula the nurse must do which of the flowing for preventing transition of the infection	incorrect	10	6.7	1.93	.250	Good
	correct	140	93.3			
	Total	150	100.0			
6-What should the nurse do before inserting the cannula?	incorrect	26	17.3	1.83	.380	Good
	correct	124	82.7			
	Total	150	100.0			
7-According to the CDC guidelines, make sure the ventilator circuit is changed	incorrect	108	72.0	1.28	.451	Good
	correct	42	28.0			
	Total	150	100.0			
Overall				**1.5**	**0.383**	**Good**

"N= Number, % = Percentage, M.s.= Mean of score (1.5), Poor (mean == <1.5), Good (mean=≥ 1.5), S.d=Standard deviation"

This table shows that the level of the critical care nurses knowledge related to the infection control measures recorded good for most of the items (1.5±0.383).

Table (3.d): level of nurse's knowledge related to the medication safety domain.

Items		Frequency	Percent	Mean	Sd , deviation	Assessment
1- What is the most important role of the nurse in preventing drug errors?	incorrect	58	38.7	1.61	.489	Good
	correct	92	61.3			
	Total	150	100.0			
2-When giving a drug to a patient who is awake but confused, what is the best way to identify the patient?	incorrect	88	58.7	1.41	.494	Poor
	correct	62	41.3			
	Total	150	100.0			
3-Which right of medication administration would the nurse keep in mind?	incorrect	85	56.7	1.43	.497	Poor
	correct	65	43.3			
	Total	150	100.0			
4-The nurse administers a medication to the wrong client. Which is the appropriate nursing action fallowing this error ?	incorrect	79	52.7	1.47	.501	Poor
	correct	71	47.3			
	Total	150	100.0			
5-A patient with a head injury was prescribed to him by the doctor mannitol 200ml. the nurse noticed that the liquid was not clear and contain crystal particles. The nurse will	incorrect	78	52.0	1.48	.501	Poor
	correct	72	48.0			
	Total	150	100.0			
Overall				**1.48**	**0.496**	**Poor**

"N= Number, % = Percentage, M.s.= Mean of score (1.5), Poor (mean == <1.5), Good (mean=≥ 1.5), S.d=Standard deviation"

This table shows that the level of the critical care nurses knowledge related to the medication safety recorded poor for most of the items (1.48±0.496).

Table (3.e): level of nurse's knowledge related to positioning domain.

Items		Frequency	Percent	Mean	Sd , deviation	Assessment
1-Bed rest and immobility, affects the whole body. What is the most complication which effect the musculoskeletal system?	incorrect	129	86.0	1.14	.348	poor
	correct	21	14.0			
	Total	150	100.0			
2-A nurse is providing care for a comatose patient. What can happen to the feet if they are un supported in the dorsiflexed position ?	incorrect	120	80.0	1.20	.401	Poor
	correct	30	20.0			
	Total	150	100.0			
3-Patient is in protective sims position. Which of the fallowing preventive actions are appropriate to prevent complication associated with this position accept ?	incorrect	135	90.0	1.10	.301	Poor
	correct	15	10.0			
	Total	150	100.0			
4-Safe practices for extending a patient's arms on arm boards include	incorrect	108	72.0	1.28	.451	Poor
	correct	42	28.0			
	Total	150	100.0			
5-A patient is supine and the head of the bed is elevated to 45 to 60 degrees. What position is this called?	incorrect	142	94.7	1.05	.225	Poor
	correct	8	5.3			
	Total	150	100.0			
6-Which statement is true regarding the positioning of patients who's had a stroke?	incorrect	114	76.0	1.24	.429	Poor
	correct	36	24.0			
	Total	150	100.0			
7-Comatose patient has been placed in a protective supine position. Which of the following are complications due to this position to be concerned about?	incorrect	89	59.3	1.41	.493	Poor
	correct	61	40.7			
	Total	150	100.0			
Overall				**1.20**	**0.378**	**Poor**

"N= Number, % = Percentage, M.s.= Mean of score (1.5), Poor (mean == <1.5), Good (mean=≥ 1.5), S.d=Standard deviation"

This table shows that the level of the critical care nurses knowledge related to the positioning recorded poor for most of the items (1.20±0.378)

Table (3.f): level of nurse's knowledge related to personal protective equipment domain.

Items		Frequency	Percent	Mean	Sd , deviation	Assessment
1-How can medical gloves be made reusable?	incorrect	34	22.7	1.77	.420	Good
	correct	116	77.3			
	Total	150	100.0			
2-The nurse prepares to wear personal protective equipment (PPE) when entering a client's room. What action does the nurse take first?	incorrect	92	61.3	1.39	.489	Poor
	correct	58	38.7			
	Total	150	100.0			
3-The nurse removes personal protective equipment after caring for a client on transmission-based precautions. Which action by the nurse is correct ?	incorrect	103	68.7	1.31	.465	Poor
	correct	47	31.3			
	Total	150	100.0			
4-Wearing a bra (robe) is necessary for nursing care providers when	incorrect	58	38.7	1.61	.489	Good
	correct	92	61.3			
	Total	150	100.0			
5-The first steps to remove protective clothing and equipment after leaving the isolation room are	incorrect	98	65.3	1.35	.478	Poor
	correct	52	34.7			
	Total	150	100.0			
6-A patient has an infections that is spread through droplet. Which of the following is essential for the nurse to use when taking his temperature?	incorrect	41	27.3	1.73	.447	Good
	correct	109	72.7			
	Total	150	100.0			
Overall				**1.52**	**0.464**	**Good**

"N= Number, % = Percentage, M.s.= Mean of score (1.5), Poor (mean == <1.5), Good (mean=≥ 1.5), S.d=Standard deviation"

This table shows that the level of the critical care nurses knowledge related to the personal protective equipment recorded good for most of the items (1.52±0.464).

Table (3.g): level of nurse's knowledge related to safety sharp disposal domain.

Items		Frequency	Percent	Mean	Sd , deviation	Assessment
1-Disposable, contaminated needle boxes should be replaced when they are	incorrect	71	47.3	1.53	.501	Good
	correct	79	52.7			
	Total	150	100.0			
2-The most common devices associated with needle stick/sharps injury are	incorrect	67	44.7	1.55	.499	Good
	correct	83	55.3			
	Total	150	100.0			
3-The first step after a needlestick or sharps injury is to	incorrect	88	58.7	1.41	.494	Poor
	correct	62	41.3			
	Total	150	100.0			
4-Where should sharps containers be located ?	incorrect	130	86.7	1.13	.341	Poor
	correct	20	13.3			
	Total	150	100.0			
5-When carrying a sharps container, the nurse should carry the container from	incorrect	134	89.3	1.11	.310	Poor
	correct	16	10.7			
	Total	150	100.0			
6-Sharp container containing all the fallowing accept	incorrect	30	20.0	1.80	.401	Good
	correct	120	80.0			
	Total	150	100.0			
7-How long can Sharps be stored?	incorrect	130	86.7	1.13	.341	Poor
	correct	20	13.3			
	Total	150	100.0			
Overall				1.38	0.412	Poor

"N= Number, % = Percentage, M.s.= Mean of score (1.5), Poor (mean == <1.5), Good (mean=≥ 1.5), S.d=Standard deviation"

This table shows that the level of the critical care nurses knowledge related to the safety sharp disposal recorded poor for most of the items (1.38±0.412).

Table (3.h): level of nurse's knowledge related to bed side rails domain.

Items		Frequency	Percent	Mean	Sd , deviation	Assessment
1-Its necessary to check the bed rails ?	incorrect	49	32.7	1.67	.471	Good
	correct	101	67.3			
	Total	150	100.0			
2-Which of the following would be most important for the nurse to keep in mind regarding the use of side rails for a confused patient?	incorrect	47	31.3	1.69	.465	Good
	correct	103	68.7			
	Total	150	100.0			
3-Which nursing intervention is the highest in priority for a client at risk for falls in a hospital setting?	incorrect	47	31.3	1.23	.420	Poor
	correct	103	68.7			
	Total	150	100.0			
4-The nurse is changing the bed linen of a patient on bed rest. When the nurse is ready to make the other side of the bed, what will the nurse do before having the patient turn onto the side that has already been made?	incorrect	97	64.7	1.35	.480	Poor
	correct	53	35.3			
	Total	150	100.0			
5-The purpose for padding side rails on the client's bed is t	incorrect	51	34.0	1.66	.475	Good
	correct	99	66.0			
	Total	150	100.0			
Overall				**1.52**	**0.462**	**good**

"N= Number, % = Percentage, M.s.= Mean of score (1.5), Poor (mean == <1.5), Good (mean=≥ 1.5), S.d=Standard deviation"

This table shows that the level of the critical care nurses knowledge related to the bed side rails recorded good for most of the items (1.52±0.462).

Table (3.i): level of nurse's knowledge related to disinfection and sterilization domain.

Items		Frequency	Percent	Mean	Sd , deviation	Assessment
1-After completing the steam sterilization cycle, wrapped, sterilized items should be	incorrect	120	80.0	1.20	.401	Poor
	correct	30	20.0			
	Total	150	100.0			
2-A nurse is preparing a sterile field for a confused patient, when accidental touch occurs for the sterile equipment, what is the proper action in this situation?	incorrect	108	72.0	1.28	.451	Poor
	correct	42	28.0			
	Total	150	100.0			
3-When the nurse try to pour fluid in the sterile field. What is a proper way to performed that to maintain the field sterility ?	incorrect	106	70.7	1.29	.457	Poor
	correct	44	29.3			
	Total	150	100.0			
4-Sterilization process for surgical instrument which should be fallowed are	incorrect	136	90.7	1.09	.292	Poor
	correct	14	9.3			
	Total	150	100.0			
5-The best way to sterile the surgical instruments after cleaning from the soil is	incorrect	77	51.3	1.49	.501	Poor
	correct	73	48.7			
	Total	150	100.0			
Overall				**1.27**	**0.420**	**Poor**

"N= Number, % = Percentage, M.s.= Mean of score (1.5), Poor (mean == <1.5), Good (mean=≥ 1.5), S.d=Standard deviation"

This table shows that the level of the critical care nurses knowledge related to the disinfection and sterilization recorded poor for most of the items (1.27±0.420).

Table (4): Overall level of nurse's knowledge related to safety measures.

List	Domains	Mean	S d .deviation	Assessment
1	Nurses knowledge related to environmental safety	1.27	0.386	Poor
2	nurses knowledge related to hand hygiene	1.42	0.439	Poor
3	nurses knowledge related to Infection control measures	1.5	0.383	Good
4	nurses knowledge related to medication safety	1.48	0.496	Poor
5	nurses knowledge related to positioning	1.20	0.378	Poor
6	nurses knowledge related to personal protective equipment	1.52	0.464	Good
7	nurses knowledge related to safety sharp disposal	1.38	0.412	Poor
8	nurses knowledge related to bed side rails	1.52	0.462	Good
9	nurses knowledge related to disinfection and sterilization	1.27	0.420	Poor
Overall knowledge related to safety measures		**1.39**	**0.328**	**Poor**

"N= Number, % = Percentage, M.s.= Mean of score (1.5), Poor (mean == <1.5), Good (mean=≥ 1.5), S.d=Standard deviation"

This table presented that that the overall statistical results of the critical care nurses who participate in the study recorded poor knowledge related to the safety measures issue (1.39±0.328).

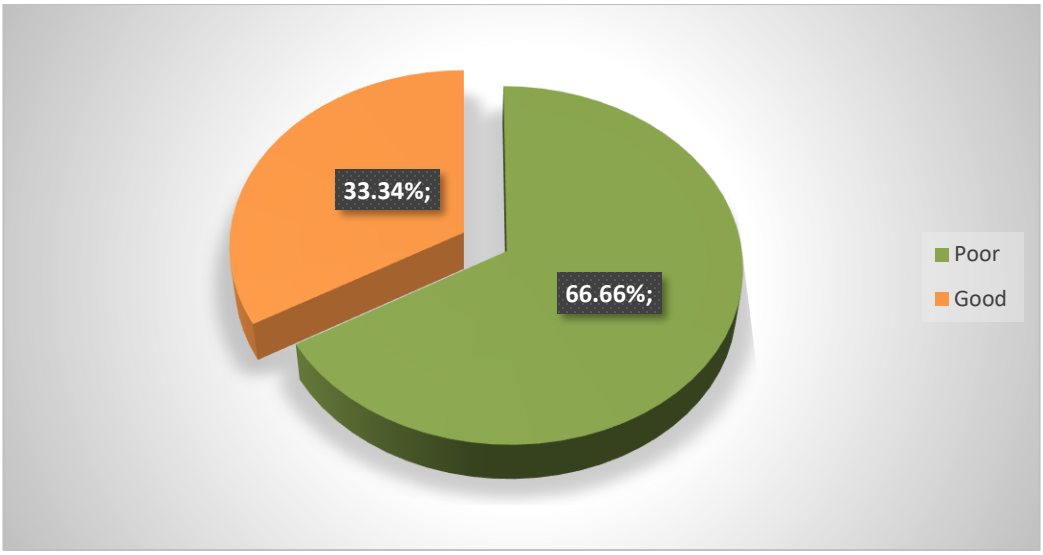

Figure (1): overall critical care nurse's knowledge related to safety measure issue

This figure shows that the critical care nurses knowledge related to safety measures issue were unsatisfied.

Table (5): Statistical relationship between critical care nurse's knowledge and their demographical characteristics

No.	Parameters	df	Sig	
1	Overall knowledge Gender	1	χ^2 crit.= 3.326 P-value=0.068	NS
2	Overall knowledge Age	2	χ^2 crit.= 1.738 P-value=0.419	NS
3	Overall knowledge Level of Education	1	χ^2 crit.= 0.417 P-value=0.812	NS
5	Overall knowledge Residency	1	χ^2 crit.= 0.089 P-value=0.765	NS

χ^2 crit =Chi-square critical, Df= Degree of freedom, P-value= Probability value, S= significant, NS= non-significant

The results demonstrated that nurses' demographical characteristic had no significancy with their knowledge regarding safety measure for all domains, and on p-value (<0.05) for the education status.

Table (6): Statistical relationship between critical care nurse's knowledge and their employment characteristics

No.	Parameters	df	Sig.	
1	Overall knowledge Years of Experienced	2	χ^2 crit.= 1.387 P-value=0.500	NS
2	Overall knowledge Years of Experience in RCU	2	χ^2 crit.= 0.794 P-value=0.672	NS
3	Overall knowledge Formal training	1	χ^2 crit.= 1.449 P-value=0.229	NS

χ^2 crit =Chi-square critical, Df= Degree of freedom, P-value= Probability value, S= significant, NS= non-significant

The results demonstrated that nurses' employment characteristic had no significant relationship with the critical nurse's knowledge regarding safety measure at (p-value >0.05).

Chapter Five

Dissections

Chapter Five

Dissection

This chapter is structured to interpretation and analyzed the finding related to nurse's knowledge regarding safety measures at critical care units in Al-Hillah teaching hospitals.

Part I: Demographic characteristics

Table (1) presented the demographical characteristics of the study sample which revealed that most of the sample (94%) were within (20-30) years old, (53.3%) male, married, (56.7%) bachelor degree holder, and urban area resident.

As well as, the study findings disagree with study conducted in Egypt at critical care unit, the findings of this study illustrated that (60.7 %) of the study samples were female and (67.9 %) at age groups (20-30) year old, (73.2%) were single, (44.6%) had (1-5 year) skill in critical units (Adly *et al*.,2020)

Part II: General information

Table (2) shows that most of the sample of the study were with one year and above experience in the critical care unit, (52%) of the participant didn't attend any educational sessions related to hospitals safety measures. This finding go parallel with the study which find that more than a half of the nurses who participate in the study have un experience between (1-5) years (Kandeel and Tantawy,2014), Aboul-Fotouh et al.,2016, find in their study which conducted in teaching hospital in Cairo, related to patient safety among health care providers that most of the study sample have lake of knowledge related to

studied issue because they didn't involve with special training courses which prepared regarding safety standers precaution's in the work place.

As a stand point, nurses in the critical care are responsible for constant monitoring of the patient's conditions as well as recognition of any subtle changes, by using amount of technologies within their practices, for this reason most of health agencies preferred nurses with 1 to 2 years of experience in the medical or surgical experience, bachelor of science in nursing which prepare nurses to provide holistic care for the patients and cover all needs of his\her family members.

Part III: Safety measures domains

First domain: environmental safety

The results in table (3.a) show that the nurses knowledge regarding environmental safety measures were low (1.27±0.386), most of the nurses shows (66.7%) and (85.7%) regarding humidity and temperature the nurses show low level of knowledge. This result agrees with the study which carried out by Sallamy *et al*.,2018, who selected (133) nurses in order to assess the awareness among healthcare workers regarding physical hazard safety, the finding shows that the higher percentage of the participant's had poor knowledge about noise, radiation hazards and temperature which affect patient environment. While Pramanik *et al*.,2016, found that nurse's knowledge related to environmental hazards was found to be adequate or moderately adequate in majority of nurses (80.7%).

Changes in the room temperature affect the body temperature directly in the ICU patients (Stephan *et al*.,2003). Therefore, the temperature and humidity should be maintained within specified limits. The CDC environmental infection

control guidelines state that the temperature should be maintained between 20°C and 24°C, while the humidity should be kept between 30% to 60% at the hospitals units (Şimşek *et al*,2017).

Regarding prioritization of sleep in ICU, most of the participants (87.3%) show low level of knowledge this finding agree with McIntosh and MacMillan,2009, argue that a lack of available evidence contributes to the nurse's deficiencies in sleep prioritization. Sleep disruption is frequent in critical care patient, and it has serious psychophysiological consequences that delay recovery and increase mortality. Critical care patients' bio-physiological monitoring reveals changes in sleep pattern, as well as decreased sleep quality and consistency. The etiological reasons of sleep disruption are multifaceted, while environmental stressors such as noise, light, and clinical care interaction are thought to have a role (Delaney *et al*.,2015).

Second domain: hand hygiene

Table (3.b) show the overall mean regarding nurse's knowledge related to hand hygiene (1.42±0.439), which indicated unsatisfactory level of knowledge.

These findings agree with a study carried out to assess Knowledge, Beliefs and Practices towards hand hygiene which showed that the majority of nurses received less than 6 out of a possible twelve points, indicating a lack of knowledge of hand washing. (Ghezeljeh *et al*., 2015). Also, the results agree with a study conducted by Ghadamgahi *et al*.,2013, according to the findings, only 47.8% of nurses achieved an adequate level of knowledge in this area. While Najafi *et al*.,2011, said that nurses mostly chose appropriate hand washing materials after doing official tasks, they had less understanding about

correct washing hands and scrubbing. According to Jang *et al*.,2010, healthcare workers lacked knowledge on hand-washing guidelines.

Hand hygiene consider one of the most important strategies to decrease cross infection in the health setting, for this reason un educational program which had a positive effect on retention of knowledge and practices in all health care providers.

Third domain: Infection control measures

The table (3.c) shows that the nurses have good knowledge regarding infection control measures the overall evaluation (1.5±0.383), which state acceptable level. The result goes a line with study carried out in 2009, entails "Evaluation of knowledge and practice amongst nursing staff toward infection control measures in a tertiary care hospital" which show that most of the nurses who participate in the study sample (75.5%) at a tertiary care hospital had sufficient knowledge regarding infection control (Taneja *et al*.,2009). The study agrees with Ibrahim et al.,2011, who noticed that the higher percentage of their investigated group of nurses conscious with what infections is, and how it will be transferred. According to Perry and Potter,2002, nurses may act to prevent diseases by knowing how they are transferred or disseminated. The findings support Escander's,2014, paper, Intensive care nurses' knowledge and behavior's regarding infections control and prevention strategies in a chosen Egyptian cancer hospital, which found that the majority of nurses had enough knowledge of preventing infection due to ongoing education.

The results agree with a study conducted by Mahfouz, 2016, who find that 53% of nurses reported awareness related to infectious diseases precautions were important and applied in the hospital. The result is also agreeing with a study performed by Asadollahi *et al*.,2015, titled "Hand hygiene awareness

among nurses, and personal and organizational factors". The study's findings show that nurses' knowledge was appropriated in the field of nosocomial precautionary measures, especially concerning strategies of transmission of infectious agents and the proper time for performing hand hygiene.

Mathai *et al*.,2010, reported that the education and gaining knowledge of healthcare workers is essential to improve their knowledge and practices and referenced that healthcare workers can protect themselves from contact with infectious material or exposure to communicable diseases by having enough knowledge and understanding of the infectious process and appropriate barrier protection .So the healthcare worker education has a positive impact on improving hand hygiene and reducing healthcare-associated infection.

As appoint of view, the Corona pandemic played an important role in developing the knowledge of nurses about infection control among patients or even among nurses through the intensive courses that nurses working in critical care units underwent to reduce the risk of infection spreading and this reflected positively on their knowledge.

Fourth domain: Medication safety

Table (3.d) shows that the overall mean related to nurses' knowledge regarding medication safety (1.48±0.496), which state poor level. The majority of occurrences recorded, according to the Evans *et al*.,2006, were linked to bed sores, infection prevention and control, patient misidentification, patient fall, and prescription mistake owing to a nurse's knowledge fault.

The findings are consistent with a research conducted to measure nurses' knowledge and practice about medication mistakes in critical care unit, which found that the majority of nurses had inadequate general understanding about

drug safety. This could be due to a lack of teaching in the area, a lack of regular group discussions to revive their knowledge about medications administration mistakes, a low motivation, or a rise in nursing workload, all of which have caused nurses' abilities and motivation to obtain and enhance their knowledge to lag (Fathy *et al*., 2020). This conclusion is consistent with a research done by Mansour, 2019, titled "The Impact of Maternity Nurses' Medications Error Knowledge and Practice on Laboring Women's Safety in the Labor Unit," which found that more than 50 % of respondents had insufficient knowledge.

The results are in line with a research of Samundeeswari & Muthamilselvi, 2018. which focused on addressing nurses' knowledge on medication error prevention. The study found that one-third of the nurses studied have average knowledge of medication error, 1/3 of nurses possess poor knowledge, slightly more than a 1/4 of nurses have had very low knowledge, 8percent of nurses have good knowledge on medication administration errors avoidance.

On the other hand, the results contradict a cross-sectional study performed by Johari *et al*.,2013, in order to evaluate the level of information among nurses that contributes to medication errors. The study stated that more than 50% of the nurses in Sik Hospital (54 percent) had medium knowledge, 46 percent had high knowledge, and none had low knowledge.

Medications mistakes have been linked to a lack of in-service education and insufficient understanding among nursing graduates, according to several studies, a deficiency of pharmacologic expertise has also been linked to medication administration errors. (Cloete,2015).

Medication safety consider one of the most main issue in the health sector, the finding recommended that the nurses should attended special training

program to elevated their knowledge regarding medication safety and to improve patient safety too. Similar findings were found in a research showing the need of a drug mistake awareness programme for nursing personnel. where boosting nurses' pharmacological knowledge was strongly suggested as a way to prevent major medication mistakes, leading to a considerable increase in the nurses' knowledge of the reasons. includes recording of medications mistakes that have occurred as a consequence of developing and executing a training programme to enhance awareness of medication administration errors and other pharmaceutical-related safety problems among in-patient nursing staff (Elnour,2008).

Fifth domain: Positioning

According to table (3.e) which shows that the overall mean (1.42±0.439), of the nurses who work in critical care units have a poor knowledge regarding patient positioning. The result agrees with study which conducted by Qaddumi and Khawaldeh,2014 who selected (194) nurses in order to assess nurses' knowledge regarding pressure ulcer prevention, the result showed that most of the nurses (73%) knowledge score about the pressure ulcers was low and below satisfactory level and had inadequate knowledge in the area of pressure ulcer prevention. The study results also agree with study conducted by Nasreen *et al*.,2017, entails "Nurses Knowledge and Practices Toward Pressure Ulcer Prevention in General Hospital Lahore" the study shows that nurses overall knowledge was only (8.3%) have good knowledge, (11.1%) have fair knowledge and (80.6%) have poor knowledge about pressure ulcer prevention. However, prior studies have shown that the knowledge of the nurses related to the prevention of pressure injury was unfavorable (Rafiei *et al*.,2020).

Furthermore, the results of the study disagree with a study conducted by Mohamed & Weheida,2015, In order to determine the impact of trying to implement a pressure sores control educational program on nurses' knowledge and the safety of immobilized patients, the study found that nurses have a moderate level of knowledge about identifying pressure ulcer risk factors, managing pressure ulcers, and preventing pressure ulcers. Similarly, Meesterberends *et al*.,2011 discovered that nurses working in Dutch hospitals had a modest understanding of the value of pressure ulcer prevention techniques.

Pressure ulcers are a widespread issue in the healthcare system as a result of poor patient placement, and they place a considerable burden on patient and caregivers. Pressure ulcers developed in hospitals are a significant source of avoidable damage. It is linked to a large rise in the cost of therapy, duration of stay, and injury, according to the result the nurses should attend training program to elevated their knowledge regarding patient positioning and prevent the complication. A study by Feng *et al*.,2016 suggested that an education program for pressure ulcer prevention not only show an increase in staff knowledge also it leads to a significant decrease in incidents of pressure ulcers.

Sixth domain: Personal protective equipment

Table (3.f) shows that the overall mean of nurse’s knowledge regarding personal protective equipment, (1.52±0.464) which indicated that the nurses who work in critical care units have a good knowledge regarding personal protective equipment.

These findings are in line with a research that looked at nurses' knowledge and compliance with PPE in critical care units. The study found that (60 percent) of nurses had a high level of PPE knowledge and (40 percent) of

nurses had a poor level of PPE knowledge. This demonstrates that the respondents' overall knowledge, including knowledge, is high (Cahyaning Pramesti, 2017). The findings are consistent with a survey done by Bhattarai & Pradhan in 2021, which found that half of the respondents (70.7%) have appropriate understanding of how to utilize PPE. A similar finding was discovered in a cross-sectional research of 393 healthcare professionals from five different districts in Bangladesh, which demonstrated that the majority of the 391 (99.5 percent) had strong awareness of personal protection equipment (Badgujar *et al*.,2021).

Otherwise, the findings of the research contradict a study conducted by (Zahra,2017). Only 13percent of the participants in this research had a high level of knowledge, 27percent had a moderate level of knowledge, and the majority (60percent) had a low level of knowledge. These findings are similar to those of a study conducted in Nigeria, which found that health-care workers' knowledge, attitudes, and beliefs about the use of personal protective equipment (PPE) were shockingly low. The study found that only 25.7 percent of the respondents had sufficient information regarding PPE (Alao *et al*.,2020).

Seventh domain: Safety sharp disposal

Table (3.g) shows that the overall mean of the nurse’s knowledge regarding sharp safety disposal, were (1.38±0.412) which indicated that the nurses how work in critical care unit were with poor knowledge regarding sharp safety disposal.

These finding agree with the finding of the study of Sabaa *et al*.,2021, who selected (486) nurses in order to evaluate the level of awareness, prevalence and risk factor of needle-stick and sharps injuries, the study shows that (59.2%) of nurse’s lack of knowledge about sharp disposal, mainly in

handling of sharp boxes. The finding also agrees with a study to knowledge and practice of nurses about needle stick injury, the study shows that most of the nurses have poor knowledge and practices regarding needle stick injury (Zia *et al*.,2017).

The findings corroborate each other. Shah *et al*.,2010, found that health care workers' knowledge of the associated risks with needle sticks and the use of prevention strategies was inadequate, and Siddique *et al*.,2008, found that health care workers' knowledge of the risks associated with sharps injuries and the use of prevention strategies was inadequate.

Ali, 2014 found that, more than two third (79.2%) of nurse`s had experienced needle stick and sharp injury the majority (78.9%) did not report that the incident, there was lack of knowledge among nurse`s regarding important of reporting needle stick injury, so nursing staff should be aware about important of incidence report, and hospital policy need to encourage reporting system. This supported by previous study mentioned that "Reporting needle stick injures is important as it lead to sharing of the causes of injuries and subsequent prevention of those accidents" (Honda *et al*, 2011).

The safe use, and disposal, of sharps is one of the most critical health and safety issues registered nurses will face in the workplace. As the result show the poor of nurse's knowledge regarding safety sharp disposal the nurses should involve in training session to elevated their knowledge and to prevent the serious complication that may occur because of their acknowledgment, it agrees with Study of Arora *et al*.,2010, found a few gaps in healthcare personnel' understanding concerning needle-stick and related injuries. such as the hazards of needle-stick injuries and the adoption of preventative measures, as well as the disassembly of needles before disposal.

Eighth domain: Bed side rails

According to the table (3.h) show that the nurses knowledge regarding bed side rails, the overall mean (1.52±0.462) show that the nurses have a good knowledge regarding bed side rails. This results agree with a study of Suliman *et al*.,2017, in order to assess "Physical restraint knowledge, attitudes, and practices of critical care unit's nurses", the study shows that (74%) of participants nurses had sufficient knowledge about restraint (bed rails) use. Similarly, Azab and Abu Negm's,2013, study which carried out on (131) nurses in critical care units found that most of the nurses had moderate knowledge score regarding restraint (bed rails) use. The study results go a line with study carried out by Kassew *et al*., 2020, The majority of nurses (80%) had a fair degree of understanding on the use of physical restraint (bed rails) in extremely sick patient, according to the study.

The results of the study also disagree with El-Latief,2015, who studied nurses' knowledge, attitudes and practice toward safety physical restraints use in ICU and discover that 2/3 of the studied nurses had poor level of knowledge about physical restraint. Also the finding agreed with Khalil *et al*.,2017, who studied "Nurses' knowledge, attitude, and behavior's regarding inpatient physical restraints and isolation" The findings indicate that most nurses have insufficient knowledge about physical restraint and isolation, which has an influence on their performance and attitudes while caring for mentally ill patient.

Nurses are the most important people in hospital when it comes to using physical restraints since they are in charge of the whole system, from decision-making to application to care for restricted patient. Patient safety will be harmed

by nurses' lack of awareness and unfavorable attitude about the usage of physical restraint. (Mehrok *et al*.,2020).

Ninth domain: Disinfection and Sterilization

Table (3.i) shows that the nurses knowledge regarding disinfection and sterilization recorded overall mean (1.27±0.420) nurses have poor knowledge regarding disinfection and sterilization.

These finding agree with study carried out by Soliman, 2007, in order to assess of nurses' knowledge and attitude toward infection standards precautions, the result of the study shows that regarding to decontamination process; the majority of nurses lacked in knowledge about the disinfection and sterilization process. The results of the study are agree with a study of Grillo *et al*.,2004, in order to evaluate nurse's knowledge of disinfection practices and behavior, which shows that a most of nurses do not know the correct procedures of disinfection and sterilization procedures. Also, a study carried out by Beder and Michel,2004, the study shows that only 12% of nurses have satisfactory knowledge level about sterilization process. On other hand the result also disagree with study of Sukhlecha *et al*., 2015, The result of a study conducted on (280) participants to study knowledge, attitudes, and practices about sterilization among healthcare staff in a tertiary hospital revealed that 82.3 percent of health-care healthcare staff were aware of sterilization, 68.5 percent knew sterilization strategies, 51.9 percent knew common sterilization methods such as autoclaving, and 36.6 percent knew autoclaving temperature.

The incidence of HAI will be reduced through ongoing education and knowledge development, as well as the use of suitable and effective disinfectant and sterilizing procedures (Askarian *et al*., 2004). Simulation training is an excellent alternative; it is a strategy that aids in the acquisition of information,

skill, and attitude, has a beneficial impact on the delivery of medical treatment, and may be used in connection to the problem of de-contamination. (Motola *et al*., 2013).

Sterilization and disinfection are critical components of hospital infection prevention and control measures. Every day, a wide range of surgical operations are carried out in a number of hospitals. Various medical facilities are doing a growing number of invasive procedures. The surgical equipment or surgical instrument that makes contact with the patient's sterile tissues or mucus membrane during various operations has been associated to an increased risk of infection introduction into the patient's body. Infection may also be spread from person - to - person, from person to health-care personnel, and opposite, or from the environment to patients through devices that have not been adequately sterilized or disinfected. Medical professionals, laboratory employees, and health care provider should have a better awareness of these measures to prevent transmission of pathogens (Mohapatra,2017).

Table (4) shows the overall nurses knowledge regarding safety measures in critical care units, recorded overall mean (1.39±0.328) of nurses have un sufficient knowledge regarding safety measures.

The findings agree with a study which entails “The Impact of a Management Program on Nursing Staff Leadership and Adherence with ICU Protective Measures” which carried on (100) nurses, the result of the study shows most of nursing staff showed poor level of knowledge about safety measures and leading role (Abdallah *et al*.,2019). The results, also agreed with a study carried out by Yilmaz & Goris,2015, which carried out on (316) nurses who claimed in the context of "Determination of the patient experience among nurses working in critical care units" that the study's findings revealed that

(64.61 percent) of the nurses had inadequate understanding of patient safety laws and regulations.

The findings of this research corroborate that of Mamdouh *et al*., 2020, who found that more than 50% of the study nurses (68 percent) had inadequate understanding on how to apply patient's protective measures in critical care units. It might be owing to a deficiency of patient's safety training, despite the fact that the majority of the nurses in the study received training courses that were not updated or scheduled, as well as the deactivation of the Damanhur hospital's in-service education department.

Another study conducted by Abdallah *et al*., 2019, shows that nurses revealed lack of knowledge about the importance of their compliance to follow safety measures. Apparently those bedside nurses showed need to understand the risks at ICU work place and to value the importance to follow safety measures for reducing their risks. Also, they need to be enforced by educational training program to improve their knowledge and training to improve their level of compliance with safety measures. Most probably that low level of knowledge due to staff and charge nurses overlooking for ICUs work risk factors, noncompliance to safety actions, and inadequacy of charge nurses leading role toward safety measures. They were in need for appropriate educational programs to facilitate acquisition, updating, improve and correct their knowledge.

The results, also agree with Gammon *et al*.,2008, who conducted a review of the evidence for suboptimal compliance of healthcare practitioners to standard/universal infection control precautions and Labrague *et al*.,2012, study about knowledge and compliance with standard precautions among student

nurses, the findings reported that healthcare workers have poor compliance to safety measures due to lack of knowledge and training.

Tables (5 and 6) shows that there is no significances between nurse's knowledge regarding safety measures and other socio-demographical variables, which show that there are no significant associations between overall nurse's knowledge and the socio-demographical variable (age, gender, marital status, educational statues, years of experience).

These result agree with a study conducted by Mohanty,2016, carried on (100) nurses. The research revealed no significant relationship between knowledge score and age (p0.22), gender (p0.80), and professional qualification (p0.41) to examine the knowledge of staff nurses on medications error, prevention, and management. years' experience (p0.63) with a significance level of 0.05. The result also agrees with a study by Shalby,2009, which stated a no significant correlation between nurse's years of experience and their knowledge. On the same line Mohammed,2006, reported that there are no significant relationships between nurse's years of experience and their knowledge.

However, the findings contradict Mamdouh *et al*.,2020, that proved a strong statistically significant relationship in between nurses' knowledge and their education and their experience, as well as a significant relationship among nurses' knowledge and age and gender. The findings backed up So,2017 findings, which found a substantial link between years of expertise and qualifications for implementing patient protective measures.

Patients safety consider one of the essential patients right, nurses spend most of their duty time with direct contact with patients and spend long time in the health setting context, for this reason they should maintain proper safety environment to help the patient recover. Safety measures as an Important and

modern issue in nursing need knowledge, compliance and continues monitoring, this work need time and effort from the nurse and cooperation from the other health workers, work overload and nurse's shortage may act as un effective factor which decrease the maintenance of the patient's safety measure in critical area.

Chapter Six

Conclusions

and

Recommendations

Chapter Six

6.1. Conclusions:

According to the findings which presented through the tables, it can crystalized the fallowing conclusions:

Most of the critical care nurses who accept to contribute in the study were between (20-30) years old, male, married, rural area resident and bachelor degree holders.

The majority of the study sample were working in evening shift, they had not less than one year of experience in the critical care unit, most of the participant didn't involve in any training courses related to safety measures.

The presented findings recorded that most of the participants have knowledge deficits in many aspects of safety measures standard which should be taking under consideration during patient care to maintain their health and safety.

The findings presented a no significant correlation between the nurse's knowledge and demographical data such as gender, age, and education levels plus their experience years.

6.2. Recommendations:

In the light of what have been found, the following could be recommended for future work:

1- Continues educational programs are recommended to alleviate nurse's knowledge related to safety measures aspects.

2- Establishing to prepare presented sheets that often contains pictures which may be placed in focus point in the health setting to improve nurse's knowledge related to safety measures.

3- Further studies may be performed to assess the nurse's practices toward safety measures in different health settings.

4- Reinforcing hand hygiene concept among nurses by using different educational methods recommended to increase the knowledge and the quality of provided care.

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Appendices

Appendix: (1)

University of Babylon
College of Nursing
Research Ethics Committee

جـامـعة بـابـل
كـلية التمريـض
لجنة اخلاقيات البحث العلمي

Issue No:

Date: / /2022

Approval Letter

To,

Rabab Jalil Wadi

The Research Ethics committee at the **University of Babylon, College of Nursing** has reviewed and discussed your application to conduct the research study entitled **" Nurses Knowledge Regarding Safety Measures at Critical Care Units in Al-Hillah Teaching Hospitals**

The Following documents have been reviewed and approved:

1. Research protocol
2. Research instrument/s
3. Participant informed consent

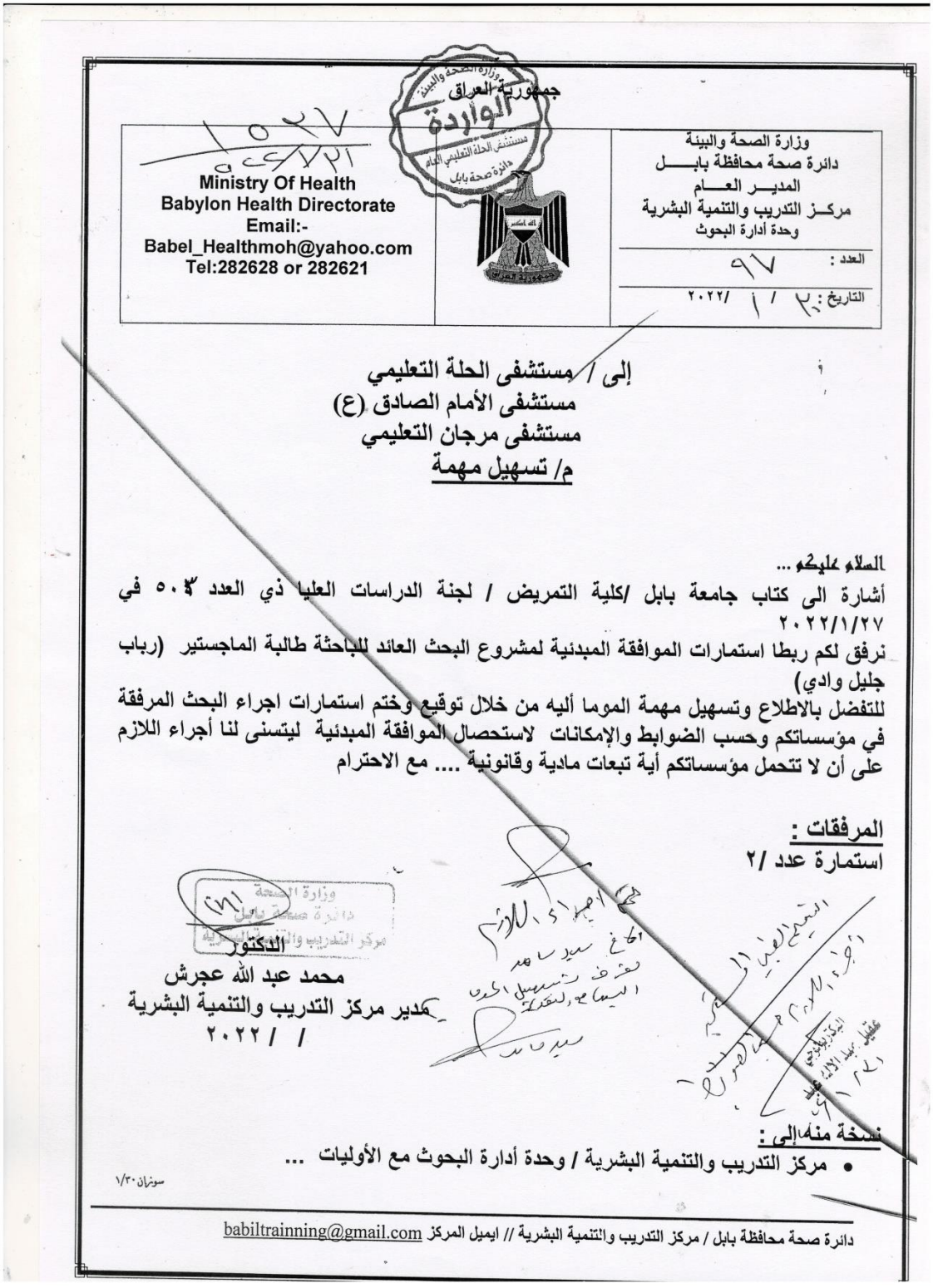
Committee Decision.

The committee approves the study to be conducted in the presented form. The Research Ethics committee expects to be informed about any changes occurring during the study, any revision in the protocol and participant informed consent.

Prof. Dr. Salma K. Jehad
Chair Committee
College of Nursing
Research Ethical Committee
١٩ / ١ /2022

UNIVERSITY OF BABYLON - FACULTY OF NURSING
UNIVERSITY OF BABYLON COLLEGE OF NURSING

Appendix: (2)



جمهورية العراق
وزارة الصحة والبيئة

Ministry Of Health
Babylon Health Directorate
Email:-
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وزارة الصحة والبيئة
دائرة صحة محافظة بابـــل
المديـــر العـــام
مركـــز التدريب والتنمية البشرية
وحدة أدارة البحوث

العدد : ٩٧
التاريخ : ٢٠ / ١ / ٢٠٢٢

إلى / مستشفى الحلة التعليمي
مستشفى الأمام الصادق (ع)
مستشفى مرجان التعليمي
م/ تسهيل مهمة

السلام عليكم ...
أشارة الى كتاب جامعة بابل /كلية التمريض / لجنة الدراسات العليا ذي العدد ٥٠٣ في ٢٠٢٢/١/٢٧
نرفق لكم ربطا استمارات الموافقة المبدئية لمشروع البحث العائد للباحثة طالبة الماجستير (رباب جليل وادي)
للتفضل بالاطلاع وتسهيل مهمة الموما أليه من خلال توقيع وختم استمارات اجراء البحث المرفقة في مؤسساتكم وحسب الضوابط والإمكانات لاستحصال الموافقة المبدئية ليتسنى لنا أجراء اللازم على أن لا تتحمل مؤسساتكم أية تبعات مادية وقانونية .... مع الاحترام

المرفقات :
استمارة عدد /٢

الدكتور
محمد عبد الله عجرش
مدير مركز التدريب والتنمية البشرية
/ / ٢٠٢٢

نسخة منه إلى :
- مركز التدريب والتنمية البشرية / وحدة أدارة البحوث مع الأوليات ...

سونان ١/٣٠

دائرة صحة محافظة بابل / مركز التدريب والتنمية البشرية // ايميل المركز babiltrainning@gmail.com

Appendix: (3)

جمهورية العراق

وزارة الصحة والبيئة
دائرة صحة محافظة بابـــل
المديـــر العـــام
مركـــز التدريب والتنمية البشرية
وحدة ادارة البحوث

العدد : ٩٧
التاريخ : ٢٠ / ١ / ٢٠٢٢

Ministry Of Health
Babylon Health Directorate
Email:-
Babel_Healthmoh@yahoo.com
Tel:282628 or 282621

الى / مستشفى الحلة التعليمي
مستشفى الأمام الصادق (ع)
مستشفى مرجان التعليمي
م/ تسهيل مهمة

السلام عليكم ...
أشارة الى كتاب جامعة بابل /كلية التمريض / لجنة الدراسات العليا ذي العدد ٥٠٣ في ٢٠٢٢/١/٢٧
نرفق لكم ربطا استمارات الموافقة المبدئية لمشروع البحث العائد للباحثة طالبة الماجستير (رباب جليل وادي)
للتفضل بالاطلاع وتسهيل مهمة المومأ اليه من خلال توقيع وختم استمارات اجراء البحث المرفقة في مؤسساتكم وحسب الضوابط والإمكانات لاستحصال الموافقة المبدئية ليتسنى لنا أجراء اللازم على أن لا تتحمل مؤسساتكم أية تبعات مادية وقانونية .... مع الاحترام

المرفقات :
استمارة عدد /٢

الدكتور
محمد عبد الله عجرش
مدير مركز التدريب والتنمية البشرية
٢٠٢٢/١/٢٠

نسخة منه الى :
- مركز التدريب والتنمية البشرية / وحدة أدارة البحوث مع الأوليات ...

Appendix: (4)

السيد / السيدة .....

أنت مدعو للمشاركة بمشروع بحث علمي بعنوان:

(معارف التمريضيين بإجراءات السلامة في وحدات العناية المركزة بمستشفيات الحلة التعليمية)

عنوان البحث

يرجى أن تأخذ الوقت المناسب لقراءة المعلومات الآتية بتأنٍ قبل أن تقرر إذا ما كنت راغباً بالمشاركة أم لا. وبإمكانك طلب مزيداً من الإيضاحات أو المعلومات الإضافية عن أي أمر مذكور بالاستمارة أو عن الدراسة من الباحث أو اي مختص أخر.

أولا : معلومات البحث	
اسم الباحث رباب جليل وادي	
اسم المشرف أ. د سحر ادهم	
أهداف البحث : 1- لتقييم معارف التمريضيين فيما يتعلق بتدابير السلامة في وحدات العناية الحرجة 2- التعرف على الخصائص الديموغرافية لعينة الدراسة 3- معرفة العلاقة بين المعرفة التمريضية بمعايير السلامة والمتغيرات الديموغرافية مثل (العمر ، الجنس ، المستوى التعليمي ، سنوات الخبرة).	
الفترة المتوقعة لمشاركة الشخص في البحث	(15-20) دقيقة
الاجراءات المتبعة في جمع العينات	تملا الاستبانة ذاتيا من قبل المشاركين
المخاطر المتوقعة كنتيجة للمشاركة في البحث	لا يوجد
الفوائد التي ستعود على الشخص مقابل الاشتراك في البحث	التعرف على مستوى معارف التمريضيين باتجاه مقاييس السلامة الواجب اتباعها في وحدات العناية الحرجة

ثانيا: معلومات للشخص المشارك بالبحث
1. ان المشاركة في هذا البحث طوعية
2. بامكانك سَحب مشارَكتك من الدِراسة متى شئت ولأي سبب
3. من حقك ان لا تجيب عن اي سؤال لا ترغب باجابته
4. ان مشاركتك بالبحث لن تحملك اي نفقات مالية
5. ان مشاركتك بالبحث لا يترتب عليها اي مسائلة قد تضر بك شخصيا أو بعملك.
6. ان اسمك سيكون سريا و إن المعلومات الناتجة عن مشاركتك سوف تعامل بسرية تامة ولن يطلّع عليها أي شخص ما عدا الباحث والمشرف ولجنه الاخلاقيات عند الضرورة.
7. وأن المعلومات التي اداليت بها والنتائج العلمية لهذا البحث هي للأغراض العلمية فقط ولن تكون هناك أية إشارة إلى لك أو لعائلتك في أي منشور عن هذه الدراسة.
8. ان من حقك بمعرفة النتائج العامة للبحث، او اي نتائج تتعلق بك بصورة خاصة.

ثالثا: معلومات الاتصال	
في حال وجود اي استفسار او شكوى من قبلك حول مشروع البحث بامكانك الاتصال بالباحث أو لجنة اخلاقيات البحث في جامعة بابل – كلية التمريض	
اسم الباحث	رباب جليل وادي
رقم الهاتف	07811437760
البريد الالكتروني	sarangaux@gmail.com
لجنة أخلاقيات الابحاث العلمية – جامعة بابل – كلية التمريض:	
رقم الهاتف	
البريد الالكتروني	

اسم المشترك بالبحث:	في حال كون عمر الشخص المشارك اقل من 18 سنة، او كونه غير قادر على فهم أو قراءة الاستمارة يرجى توقيع ولي أمره الشرعي. اسم ولي أمر المشترك:

ترفق الاستمارة او المقياس الذي سوف يستخدم لجمع العينة

Appendix: (5)

الاستبانة

(معارف التمريضيين بإجراءات السلامة في وحدات العناية الحرجة بمستشفيات الحلة التعليمية)

الجزء الاول : الصفات الديموغرافية

1- العمر ☐ **سنة**

2-الجنس :

ذكر ☐ أنثى ☐

3- الحالة الاجتماعية :

أعزب ☐ متزوج ☐ مطلق ☐

منفصل ☐ أرمل ☐

4- مستوى التعليم :

اعدادية تمريض ☐ دبلوم ☐ بكالوريوس ☐

دراسات عليا ☐

5- السكن :

ريف ☐ حضر ☐

الجزء الثاني: معلومات عامة

1- سنوات الخبرة :

أكثر من ستة أشهر ☐

2- سنوات الخبرة في العناية الحرجة:

سنه واحده ☐ 2 سنة ☐ ثلاث سنوات او أكثر ☐

3- نوبة العمل :

صباحي ☐ مسائي ☐

4- شاركت في دورات تدريبيه متخصصة بتدابير السلامة:

نعم ☐ لا ☐

عدد الدورات: ☐

المجال الأول: **السلامة البيئية**

1- أفضل طريقة للحفاظ على تدابير السلامة المتعلقة بمساعدة المريض عند وضعه في السرير هي:

أ. اضبط ارتفاع السرير على مستوى خصر الممرض.

ب. تأكد من قفل عجلات السرير.

ج. ضع السرير على الحائط.

د. الإصرار على بقاء المريض في السرير.

2- بيئة وحدة العناية الحرجة مرهقة للغاية بالنسبة للمرضى واسرهم وللعاملين . ما هي الإجراءات التمريضية الموجهة للحد من الإجهاد البيئي؟

أ) التقييم المستمر لحالة المريض.

ب) قصر الزيارات على الأقارب من الدرجة الأولى.

ج) الاستحمام لجميع المرضى خلال ساعات النوم.

د) الحفاظ على الهدوء أثناء ساعات النوم.

3- درجة الحرارة المناسبة في وحدة العناية المركزة هي :

أ. 22-27 س.

ب. 5-16 س.

ج. 16-22 س.

د. 27-33 س.

4- رطوبة الغرفة المناسبة

أ. 20-30٪

ب. 50-60٪

ج. 30-50٪

د. 70-80٪

5- تصنف معظم وحدات العناية الحرجة على أنها ..... لمنع انتقال العدوى

أ) غرفة خاصة.

ب) غرفة شبه خاصة.

ج) غرفة بها نوافذ يمكن فتحها.

د) غرفة تدفق الهواء السلبي.

6- التنظيف والتطهير يجب أن يتم على :

أ. المعدات والأدوات والأجهزة المستخدمة للمرضى أو المتواجدة بالقرب منهم.

ب. الأثاث ومحتويات غرف المرضى.

ج. اللعب الخاصة بالأطفال الموجودة ضمن مناطق العناية بهم.

د- كل ما سبق.

7- يجب على الممرضين الابلاغ عن اي حالة حرق للمصابيح الكهربائية وتسريب الصنابير وذلك من اجل :

ا- المحافظة على التدخل التمريضي .

ب- تقليل التكلفة .

ج. المحافظة على بيئة أمنه .

د. منع مشاكل الادارة .

المجال الثاني: نظافة اليدين

1- الاجراء المناسب لتحسين الالتزام بتنظيف اليدين هو :

أ- تزويد الأفراد بعلب صغيرة من مقشر اليدين المحتوي على الكحول.

ب- تزويد الأفراد بمستحضرات اليد أو الكريمات.

ج. دعم العاملين للالتزام بتنظيف اليدين .

د. ارتداء الكفوف طول اليوم .

2- يفضل فرك اليدين بمحلول محتوي على الكحول لجميع الحالات السريرية التالية باستثناء . . .

ا- عندما تكون اليدين متسخة بشكل واضح.

ب- تنظيف اليدين قبل الجراحة بواسطة طاقم الجراحة.

ج- قبل إدخال القسطرة البولية أو القسطرة داخل الأوعية الدموية أو غيرها من الأجهزة الغازية.

د- بعد نزع القفازات.

3- يتعرض العاملون في المجال الصحي للجراثيم على أيديهم من خلال القيام بما يلي:

أ. ارتداء القفازات وسحب المرضى إلى الفراش.

ب. قياس ضغط الدم أو النبض.

ج. لمس يد المريض.

د. معدات اللمس مثل قضبان السرير ، والطاولات فوق السرير ، والمضخات الوريدية.

4- تشير نظافة اليدين الى ..... ما عدى :

ا. غسل اليدين بالصابون العادي والماء .

ب. استخدام مطهر لليدين (مثل الكحول ، الكلورهيكسيدين، اليود).

ج. غسل اليدين بالماء والصابون المضاد للميكروبات .

د. غسل اليدين بالماء فقط .

5- ماذا يجب على الممرض عمله إذا لمست يده الحوض أثناء غسل اليدين قبل الاهتمام بالمريض؟

أ. أضف المزيد من الصابون إلى يديك.

ب. تطبيق المزيد من الاحتكاك أثناء الغسل.

ج. استمر في غسل يديك.

د. كرر الإجراء.

6- ما هو الغرض الرئيسي من نظافة اليدين وغسل اليدين؟

أ. لتقليل الميكروبات (الجراثيم) على اليدين.

ب. للحفاظ على صحة الجلد.

ج. لمنع انتشار العدوى.

د. كل ما ورد اعلاه.

المجال الثالث: **إجراءات مكافحة العدوى**

1- ما هو النشاط الأفضل في الوقاية من الصدمة الإنتانية للمريض خلال مكوثه بالمستشفى؟

أ) الحفاظ على المريض في حالة حرارية معيارية.

ب) إعطاء مشتقات الدم لتعويض فقد السوائل.

ج) استخدام تقنية التعقيم خلال جميع الإجراءات الغازية.

د) إبقاء المريض المصاب بحالة حرجة ثابتًا لتقليل متطلبات التمثيل الغذائي.

2- عند رعاية مريض مصاب بالتهاب الجهاز التنفسي ، ما هي أفضل طريقة يمكن للممرض من خلالها منع انتشار العدوى؟

أ) عن طريق المضادات الحيوية التجريبية.

ب) غسل اليدين.

ج) التنبيب الرغامي .

د) التطعيم.

3- أي مما يلي لا يعد جزءًا من الممارسات الاحترازية القياسية لمكافحة العدوى؟

أ- وضع المريض في غرفة العزل.

ب- غسل اليدين بالماء والصابون.

ج- التخلص من الأدوات الحادة في حاوية الأدوات الحادة.

د- إدارة انسكاب الدم أو سوائل الجسم.

4- ما هو الإجراء الأكثر أهمية للممرضين عند القيام بتغيير الضماد للمريض بعد العمليات ؟

أ) إرضاء المريض.

ب) المحافظة على التعقيم .

ج) الحصول على قفازات إضافية.

د) تنظيم اللوازم.

5- قبل وضع القسطرة الوريدية يجب على الممرض القيام بأي مما يلي لمنع انتقال العدوى:

ا. تحقق من القسطرة الوريدية .

ب. غسل اليدين واستخدم الكحول للتطهير .

ج. غسل اليدين بالماء فقط.

6- ماذا يجب أن يفعله الممرض قبل إدخال القسطرة الوريدية ؟

ا. تنظف الموقع بمحلول مطهر.

ب. وضع بخاخ مهدئ لتقليل الألم.

ج. تنظف الموقع بمحلول ملحي عادي.

7- وفقًا لإرشادات مراكز السيطرة على الأمراض والوقاية ، علينا التأكد من تغيير انابيب التوصيل المستعملة في جهاز التنفس الصناعي

أ. كل انتقال.

ب. مرة في اليوم.

ج. مرة في الأسبوع.

د. فقط عندما تكون متسخة أو معطلة بشكل واضح.

المجال الرابع: سلامة الدواء

1- ما هو أهم دور التمريضيين في الوقاية من الأخطاء الدوائية؟

أ. دائما التحقق من تشخيص المريض قبل إعطاء الدواء.

ب. دائمًا ما يتبع "الحقوق الستة" لإدارة الدواء.

ج. كونها الدفاع الوحيد عن اكتشاف الأخطاء الدوائية والوقاية منها.

د. من المرجح أن يكتشف خطأ دوائي قد حدث.

2- عند إعطاء دواء لمريض مستيقظ ومشوش ، ما هي الطريقة المثلى للتعرف على المريض؟

أ. تحقق من رقم الغرفة والسرير التي يشغلها المريض.

ب. اطلب من المريض ذكر اسمه أو تاريخ ميلاده.

ج. تحقق من الاسم الموجود على معصم المريض.

د. اسأل المريض عما إذا كان هو السيد أو السيدة (الاسم).

3- من العناصر الواجب مراعاتها لتفادي حصول الاخطاء عن اعطاء الادوية هو مراعاه :

أ. الواصف الصحيح.

ب. المريض المناسب.

ج. المرض الصحيح.

د. الإدارة الصحيح.

4- عند اعطاء الدواء للمريض الخطأ . ما هو الإجراء التمريضي المناسب بعد هذا الخطأ؟

أ. تقييم حالة المريض والابلاغ في حالة حدوث مضاعفات.

ب. توثيق الخطأ الدوائي.

ج. أبلغ عن الخطأ وقم بتوثيق الدواء على استمارة المريض.

د. الابلاغ عن الخطأ وتوثيق الخطأ والمضاعفات في استمارة الحوادث.

5- عند استعمال السائل الوريدي (المانيتول). لاحظ الممرض أن السائل لم يكن صافياً ويحتوي على جزيئات بلورية. ما هو الاجراء المناسب؟

أ- قم بتسخين السائل حتى تذوب جزيئات الكريستال.

ب- إعطائه على أي حال.

ج- تجنب الإعطاء وإخطار مسؤول الوحدة.

د- ضع جهاز الاعطاء مع مرشح واعطائه.

المجال الخامس: وضع الجسم

1- الراحة في الفراش وعدم القدرة على الحركة ، يؤثر على الجسم كله. ما هي أكثر المضاعفات التي تؤثر على الجهاز العضلي الهيكلي؟

أ. ضعف تبادل الغازات.

ب. زيادة خطر الإصابة بالخثار الوريدي.

ج. زيادة خطر التقلصات.

د. انخفاض التحفيز الحسي.

2- ماذا يمكن ان يحدث للقدم كمضاعفات اذا تركت غير مدعومة في وضعها الصحيح (اسناد القدم) لمرضى الفاقدين للوعي :

أ. تمديد الكعب والألم.

ب. تقلصات إصبع القدم وخدر.

ج. التمدد الأخمصي وفقدان القوس.

د. انثناء أخمصي وحبل القدم.

3- أي من الإجراءات الوقائية التالية مناسبة لمنع المضاعفات المرتبطة في حالة كان المريض في وضع شبه الجالس ؟

أ. وضع وسادة بين الصدر وأعلى الذراع.

ب. وضع وسادة تحت الساق العلوية المثنية من أعلى الفخذ إلى القدم.

ج. وضع وسادة صغيرة تحت الرأس.

د. استخدم لفات المدور لمنع الدوران الخارجي للوركين.

4- الممارسات الآمنة لمد أذرع المريض على ألواح الذراع تشمل على:

أ. أن تكون ألواح الذراع أقل من مستوى سرير غرفة العمليات. (يجب أن يكون بنفس ارتفاع السرير)

ب. الحفاظ على الذراعين والمعصمين في محاذاة محايدة.

ج. يجب ربط الاذرع بزاوية 90 او قل.

د. يجب أن تكون راحتي اليد متجهة لأسفل.

5- المريض مستلقي وراس السرير مرفوع الى 45 ال60 درجة. ماذا يسمى هذا الوضع ؟

أ. وضع شبه جالس .

ب. وضع جالس عالي .

ج. وضع شبه نائم .

د. وضع جالس .

6- ماهي العبارة الصحيحة فيما يتعلق بوضع الجسم للمرضى الذين اصيبوا بسكتة دماغية ؟

أ. المريض الذي اصيب بسكتة دماغية نزفيه، يجب ان يكون راس السرير مرفوعا بمقدار 30 درجة .

ب. ينصح المريض بثني الورك والرقبة اثناء وجوده في الفراش .

ج. حافظ على الراس في وضع جانبي للمساعدة في الصرف الوريدي .

د. المرضى الذين أصيبوا بسكتة دماغية، يجب ان يكون راس السرير مسطحا .

7- وضع المريض فاقد للوعي في وضع مستلقي. اي مما يلي يعد من المضاعفات الواجب القلق بشأنها ؟

أ. خلع الكتفين .

ب. الدوران الخارجي لعظم الفخذ .

ج. الشد المفرط للركبتين .

د. الشد القدمي .

المجال السادس: **معدات الحماية الشخصية**

1- كيف يمكن إعادة استخدام القفازات الطبية؟

أ. عن طريق إرسالها لإعادة معالجتها في منشأة لإزالة التلوث.

ب. مع فرك اليدين بالكحول.

ج. غسلها بالماء والصابون.

د. لا يمكنهم ذلك - يجب دائمًا التخلص من القفازات الطبية بعد الاستخدام.

2- يستعد الممرض لارتداء معدات الحماية الشخصية (PPE) عند دخول غرفة المريض . ما هو الإجراء الذي يقوم به الممرض أولاً؟

أ. افتح باب الغرفة.

ب. تأكد من إغلاق الرداء.

ج. تحقق من نوع الاحتياطات.

د. غسل اليدين.

3- بناءا على تعليمات التقليل من نقل العدوى يقوم اعضاء الفريق الصحي بإزالة معدات الحماية الشخصية بعد تقديم العناية اللازمة للمريض . ما هي الطريقة الصحيحة المناسبة لإزالة هذه المعدات ؟

أ. إزالة النظارات الواقية قبل إزالة المعدات الأخرى.

ب. مرر إحدى يديك التي ترتدي قفازًا أسفل القفاز الآخر للإزالة.

ج. المس الجزء الداخلي من الثوب واسحبه بعيدًا عن الجذع.

د. قم بإزالة القناع عند مدخل غرفة المريض.

4- ارتداء الصدرية (الرداء) ضروري لمقدمي العناية التمريضية وذلك عند :

أ. القيام بتنظيف المريض.

ب. اعطاء بعض العقاقير .

ج. إصابة المريض بمتلازمة نقص المناعة (الإيدز) أو التهاب الكبد.

د. توقع ان تتعرض ملابس العاملين للتلوث بسوائل الجسم .

5- أولى خطوات إزالة الملابس والمعدات الواقية بعد مغادرة غرفة العزل هي:

أ. قم بفك الخيوط العلوية ثم السفلية وإزالتها من الوجه.

ب. انزع القفازات.

ج. قم بإزالة النظارات أو النظارات الواقية.

د. قم بنظافة اليدين.

6- إصابة المريض بمرض معدي ينتشر عن طريق الرذاذ. أي مما يلي ضروري على التمريضيين لاستخدامه عند قياس درجة حرارته؟

أ) القفازات.

ب) نظارات واقية.

ج) ثوب.

د) قناع.

المجال السابع: التخلص الامن من المواد الحادة

1- يجب استبدال حاويات النفايات الحادة عندما تمتلئ حتى ..... حجم الحاوية

أ. 2 / 3

ب. 2/1

ج. 4/3

د. تماما .

2- اغلب الاصابات بالأدوات الحادة الملوثة داخل وحدات المستشفى تكون بسبب :

أ- الشفرات .

ب- المحاقن التي تستخدم لمرة واحدة.

ج- ابر القنى الوريدية (cannula) .

د- القنى الشريانية(arterial cannula) .

3- الخطوة الأولى بعد الإصابة بوخز الإبرة أو الأدوات الحادة هي

أ- شفط الجرح أو مصه.

ب- ضع عوامل كاوية (مثل المبيض) على الجرح.

ج- يحقن الجرح بمطهرات أو مطهرات.

د- اغسل المنطقة المكشوفة برفق بالماء والصابون دون فرك.

4- من الافضل وضع حاويات النفايات الحادة

أ- مع مستوى العين.

ب- قرب الأبواب.

ج- تحت مستوى العين.

د- قرب سرير المريض .

5- يفضل ان تمسك حاوية الادوات الحادة من ..... عند تحريكها او رفعها .

أ. المنتصف.

ب. الأسفل.

ج. الرأس.

د. أي طرف كان .

6- حاوية المواد الحادة تحتوي على كل ما يلي باستثناء:

أ. مشرط.

ب. محاقن الابر.

ج. شفرات جراحية.

د. اجهزة اعطاء السوائل.

7- كم من الوقت يمكن تخزين الأدوات الحادة؟

أ. 15يوم.

ب. 20يوم.

ج. 25يوما.

د. 30 يوما.

المجال الثامن: الحواجز الجانبية للأسرة

1- من الضروري فحص حواجز السرير :

ج: فقط عندما تتغير ظروف المريض.

ب. في كل مرة يتم استخدامها.

ج. مرة واحدة على الأقل في الأسبوع.

د. عندما يبلغ شخص ما عن خطأ.

2- أي مما يلي سيكون من الأهم في ما يتعلق باستخدام الحواجز الجانبية لمريض مشوش؟

أ. منع المريض من التجول .

ب. لمساعدته في استعادة الوعي .

ج. لعدم فعالية التدابير البديلة .

د. لتامين المريض والحفاض على سلامته.

3- ما هو التدخل التمريضي الذي يمثل الأولوية القصوى للمريض المعرض لخطر السقوط في المستشفى؟

أ. حافظ على جميع القضبان الجانبية.

ب. راجع الأدوية الموصوفة.

ج. أكمل اختبار "النهوض والذهاب."

د. ضع السرير في أدنى وضع.

4- يقوم الممرض بتغيير أغطية سرير المريض في الفراش. عندما يكون الممرض جاهز لترتيب الجانب الآخر من السرير ما هو الاجراء التي سيقوم به التمريضيين قبل ان ينقل المريض الى الجانب المرتب من الفراش ؟

أ. اخفض رأس السرير.

ب. ارفع القضبان الجانبية.

ج. ضع الورقة العلوية.

د. تخلص من الكتان المتسخ في كيس الكتان.

5- الغرض من حشو القضبان الجانبية على سرير المريض هو:

أ. استخدامها كقيود.

ب. الحصول على مكان لوضع زر الاتصال علية.

ج. حماية المريض من الاصابة.

د. حافظ على دفء المريض.

المجال التاسع : التطهير و التعقيم

1- بعد الانتهاء من دورة التعقيم بالبخار :

أ- توضع المواد المعقمة والرزم على طاولة معدنية .

ب- يمكن استخدامها فورا .

ج- تحتاج لمدة(30- 60) دقيقة لتبرد.

د- تحتاج المواد من (15-30) لتبرد.

2- عند ملامسة المريض للأدوات المعقمة المهيئة للجراحة عن طريق الخطأ ، ما هو الاجراء المناسب في هذه الحالة ؟

أ- اطلب من ممرض أخر أن يمسك بيد المريض واستمر في تجهيز المكان.

ب. قم بإزالة الأداة التي لمسها المريض واستمر في إعداد المجال المعقم.

ج- تجاهل الاعدادات وجهز حقلاً جديدًا معقمًا مع شخص آخر يمسك بيد المريض.

د. ليس من الضروري اتخاذ أي إجراء لأن المريض قد لمس مجال التعقيم.

3- عند سكب السوائل في مجال معقم، ما هي الطريقة المناسبة لذلك ؟

أ. ضع غطاء الزجاجة على المنضدة مع توجيه الحواف لأسفل.

ب- أمسك الزجاجة داخل حافة الحقل المعقم.

ج- أمسك الزجاجة بحيث يكون جانب الملصق المقابل لراحة اليد.

د- صب المحلول من ارتفاع 4 إلى 6 بوصات (10 إلى 15 سم).

4- ما هي الخطوات الواجب اتباعها عند القيام بتعقيم الادوات الجراحية ؟

أ. اغسل ، مطهر في محلول جلاتارالدهيد ، ثم تعقيمه بأكسيد الإيثيلين.

ب. غسل ، تطهير في محلول بيروكسيد الهيدروجين ، ثم تعقيم البلازما.

ج. شطف ، آلة معالجة وتطهيرها ، ثم إرسالها للتعقيم.

د. غسل، تغليف، ثم التعقيم دون خضوعها للتطهير .

5- أفضل طريقة لتعقيم الأدوات الجراحية بعد تنظيفها من البقع هي:

أ. الغليان.

ب. حرارة جافة.

ج. الحرارة و البخار .

Appendix: (6)

Questionnaire

Nurses Knowledge Regarding Safety Measures at Critical Care Units in Al-Hillah Teaching Hospitals

Part l: Demographic characteristics

1-Age : ☐

2- Gender:

a- Male ☐ b-Female ☐

3- Marital status:

a- Single ☐ b-Married ☐ c- Divorced ☐

d- Separated ☐ e- Widow ☐

4-Educational status :

a-Secondary school nursing ☐ b-Diploma ☐

c-Bachelor ☐ d- Post-graduate ☐

5- Residency:

a- Rural area ☐ b- Urban area ☐

Part ll: General Information

1- Period of Employment:

a- ≥6month ☐

2- Years of experience in critical care:

a- One year's ☐ b- Two years ☐

c- Three years or above ☐

3- Working shift:

a- Morning ☐ b- Evening ☐

4- A tendency of special courses related to safety measure:

a- Yes ☐ b- No ☐

Number of courses: ☐

First domain : Environmental safety

1- The best way to maintain safety measures relative to helping a patient get into bed is to:

a. Set the bed height at the nurse's waist level.
b. Make sure that the bed wheels are locked.
c. Place the bed against the wall.
d. Insist that the patient stays in bed.

2- The critical care unit environment is very stressful for patients, families, and staff. What nursing action is directed at reducing environmental stress?

A) Constant evaluation of patient status

B) Limiting visits to immediate family

C) Bathing all patients during hours of sleep

D) Maintaining quiet during hours of sleep

3- Appropriate room temperature

a. 22 – 27 c
b. 5 – 16 c
c. 16 – 22 c
d. 27 – 33 c

4- Appropriate room humidity is

a. 20-30%

b. 50-60%

c. 30-50%

d. 70-80%

5-Most of the critical care unit should be consider as …… to prevent cross infection

a) Private room

b) Semiprivate room

c) Room with windows that can be opened

d) Negative airflow room.

6- Cleaning and disinfection should be performed:

a. On equipment, instruments and devices used on or near patients

b. On furniture and inanimate objects in patient rooms

c. On toys in pediatric areas

d- All the above

7- Nurses should report any burnt out light bulbs and leaking faucets in order to

a- Maintain nursing intervention
b- Reduce cost
c- Maintain safety environment
d- Prevent administration problems

Second domain : Hand hygiene

1. The most adherence improvement of hand hygiene in health care facilities is

A. providing personnel with individual containers of alcohol-based hand rubs.

B. providing personnel with hand lotions or creams.

c. providing personal with feedback regarding hand hygiene adherence / performance.

d. Wearing gloves all day long

2. It is preferable to rub the hands with a solution containing alcohol for all the following clinical cases except: . .

A. When the hands are visibly soiled.

B. Preoperative cleaning of hands by surgical personnel.

C. Before inserting urinary catheters, intravascular catheters, or other invasive devices.

D. After removing gloves.

3- Healthcare workers are exposed to germs on their hands by doing the following accept :

a. Wearing gloves and Pulling patients up in bed.

b. Taking a blood pressure or pulse.

c. Touching a patient's hand.

d. Touching equipment like bedside rails, over-bed tables, IV pumps.

4- Hand hygiene refers to ... accept

A. Hand washing using plain soap and water.

B. Using an antiseptic hand rub (e.g alcohol, chlorhexidine, iodine).

C. Hand washing using antimicrobial soap and water.

D. Hand washing with water only

5- What should the nurse do if your hands touch the sink while you are washing your hands before giving care to the patient ?

a. Add more soap to your hands.

b. Apply more friction during procedure.

c. Continue to wash your hands.

d. Repeat the procedure

6- What is the main purpose of hand hygiene and hand washing?

A.) To reduce micro-organisms (germs) on the hands

B.) To keep skin healthy

C.) To prevent the spread of infection

D.) All of the above

Third domain : Infection control measures

1- Which activity would be best in preventing septic shock in the hospitalized client?

a) Maintaining the client in a norm thermic state.

b) Administering blood products to replace fluid losses

c) Using aseptic technique during all invasive procedures

d) Keeping the critically ill client immobilized to reduce metabolic demands

2- When caring for a patient with respiratory infection , what is the best way the nurse can prevent the spread of infection?

a) By empirical antibiotics

b) Hand washing

c) E.T Intubation

d) Vaccination

3- Which of the following is NOT part of standard infection control precaution practice?

a. Placing a patient in an isolation room

b. Washing hands with soap and water

c. Disposing of sharps in a sharps container

d. Managing a blood or body fluid spillage

4-What action by the nurse is most important when performing addressing change using surgical aseptic technique ?

a) Customer satisfaction

b) Maintaining sterility

c) Obtaining extra gloves

d) Organize supplies

5- Before applying iv cannula the nurse must do which of the flowing for preventing transition of the infection :

a. Check the iv cannula

b. Wash hands and use alcohol for hand antisepsis

c. Wash the hands with water only

6- What should the nurse do before inserting the cannula?

a. Clean the site by antiseptic solution

b. Apply sedative spry to minimizing the pain

c. Clean the site with normal saline

7- According to the Centers for Disease Control and Prevention guidelines, make sure the ventilator circuit is changed

a. Every shift.

b. Once a day.

c. Once a week.

d. Only when it's visibly soiled or malfunctioning.

Fourth domain : Medication safety

1- What is the most important role of the nurse in preventing drug errors?

a. Always checking the patient's diagnosis before giving a drug

b. Always following the "six rights" of drug administration

c. Being the one defense for detecting and preventing drug errors

d. Being most likely to detect a drug error that has occurred.

2- When giving a drug to a patient who is awake but confused, what is the best way to identify the patient?

a. Check the room and bed number that the patient occupies.

b. Ask the patient to state his or her name and birth date.

c. Check the name on the patient's wristband.

d. Ask the patient if he or she is Mr. or Ms. (name)

3- Which right of medication administration would the nurse keep in mind?

a. Right prescriber

b. Right patient

c. Right disease

d. Right administration

4- The nurse administers a medication to the wrong client. Which is the appropriate nursing action fallowing this error ?

a. Assess the client for an adverse reaction and report if an adverse event occurs.

b. Document the medication error.

c. Report the error and document the medication on the patient chart.

d. Notify the provider and document the error on an incident report.

5- A patient with a head injury was prescribed to him by the doctor mannitol 200ml. the nurse noticed that the liquid was not clear and contain crystal particles. The nurse will

a- Warm the fluid until the crystal particles melt

b- Administer anyway

c- Avoid administered and notified the manager

d- Put IV set with filter and administer

Fifth domain : Positioning

1- Bed rest and immobility, affects the whole body. What is the most complication which effect the musculoskeletal system?

a. Impaired gas exchange
b. Increased risk for venous thrombosis
c. Increased risk for contractures
d. Decreased sensory stimulation

2- A nurse is caring for a comatose patient. What can happen to the feet if they are un supported in the dorsiflexed position ?

a. Heel extension and pain
b. Toe contractures and numbness
c. Plantar extension and arch loss
d. Plantar flexion and footrope

3- Patient is in protective sims position. Which of the fallowing preventive actions are appropriate to prevent complication associated with this position accept ?

a. Place a pillow between the chest and upper arm
b. Place a pillow under the upper flexed leg from the groin to the foot
c. Place a small pillow under the head
d. Use trochanter rolls to prevent external rotation of the hips

4-Safe practices for extending a patient's arms on arm boards include :

a. Arm boards should be lower than the level of the OR bed. (should be at same height as OR bed)

b. Arms and wrists should be maintained in neutral alignment.

c. Arms should be abducted at least 90 degrees .(at or less than 90 degree).

d. Palms of the hand should face down.

5- A patient is supine and the head of the bed is elevated to 45 to 60 degrees. What position is this called?

A. Semi-Fowler's Position

B. High Fowler's Position

C. Sim's Position

D. Fowler's Position

6- Which statement is true regarding the positioning of patients who's had a stroke?

A. A patient that has experienced a hemorrhagic stroke, the head of the bed should be elevated 30 degrees.

B. It is recommended for the patient to bend the hip and neck while in bed.

C. Maintain the head in a sideline position to help venous drainage.

D. Patients who've had an ischemic stroke, the head of the bed should be flat.

7- Comatose patient has been placed in a protective supine position. Which of the following are complications due to this position to be concerned about?

a. Dislocation of the shoulders

b. External rotation of the femurs

C. Hyperextension of the knees

d. Footrope

Sixth domain : Personal Protective Equipment

1- How can medical gloves be made reusable?

a. By sending them off to be reprocessed at a decontamination facility

b. With an alcohol based hand rub

c. Washing them with water and soap

d. They can’t - medical gloves must always be disposed of after use

2- The nurse prepares to wear personal protective equipment (PPE) when entering a client's room. What action does the nurse take first?

a. Open the door to the room.

b. Ensure the gown is closed.

c. Verify the type of precautions.

d. Hand washing

3- The nurse removes personal protective equipment after caring for a client on transmission-based precautions. Which action by the nurse is correct ?

a. Remove the goggles before removing other equipment.

b. Slide one gloved hand under the other glove for removal.

c. Touch the inside of the gown and pull it away from the torso.

d. Remove mask at the doorway of the client's room.

4-Wearing a bra (robe) is necessary for nursing care providers when:

a. Do the cleaning of the patient.

b. Give some medicine.

c. The patient has immunodeficiency syndrome (AIDS) or hepatitis.

d. It is expected that workers' clothing will be exposed to contamination with bodily fluids.

5- The first steps to remove protective clothing and equipment after leaving the isolation room are:

a. Untie top, then bottom mask strings and remove from face.

b. Remove gloves.

c. Remove eyewear or goggles.

d. Perform hand hygiene.

6- A patient has an infection that is spread through droplets. Which of the following is essential for the nurse to use when taking his temperature?

a) Gloves

b) Goggles

c) A gown

d) A mask

Seventh domain : safety sharp disposal

1- Disposable, contaminated needle boxes should be replaced when they are/

a. 2/3rds full

b. 1/2 full

c. 3/4 full

d. Completely full

2- The most common devices associated with needle stick/sharps injury are

a. Scalpel blades.

b. Disposable syringes.

c. Winged steel needles.

d. Intravenous catheter stylets **.**

3- The first step after a needlestick or sharps injury is to

A)Express or suck the wound.

B)Apply caustic agents (e.g., bleach) to the wound.

C)Inject antiseptics or disinfectants into the wound.

D)Gently wash the exposed area with soap and water without scrubbing.

4- Where should sharps containers be located ?

A – Within eye level

B - Near doors

C - Below eye level

D – Above eye level

5- When carrying a sharps container, the nurse should carry the container from :

a. From the middle

b. From the bottom

c. From the head

d. From any side

6- Sharp container containing all the fallowing accept :

a. Lancets

b. Syringe Needles

c. Surgical blades

d. Iv set

7- How long can Sharps be stored?

a. 15 days

b. 20 days

c. 25 days

d. 30 days

Eighth domain :Bed side rails

1- Its necessary to check the bed rails ?

A. Only when patient circumstances have changed

B. Every time they are used

C. At least once a week

D. When somebody reports a fault

2- Which of the following would be most important for the nurse to keep in mind regarding the use of side rails for a confused patient?

a. They prevent confused patients from wandering

b. A history of a previous fall from a bed with raised side rails is insignificant

C. Alternative measures are ineffective to prevent wandering

d. A person of small stature is at increased risk for injury from entrapment

3-Which nursing intervention is the highest in priority for a client at risk for falls in a hospital setting?

a. Keep all of the side rails up.

b. Review prescribed medications.

c. Complete the "get up and go" test.

d. Place the bed in the lowest position.

4- The nurse is changing the bed linen of a patient on bed rest. When the nurse is ready to make the other side of the bed, what will the nurse do before having the patient turn onto the side that has already been made?

a. Lower the head of the bed
b. Raise the side rails
c. Apply the top sheet
d. Discard the soiled linen in the linen bag

5- The purpose for padding side rails on the client's bed is to:

a. Use them as a restraint
b. Have a place to connect the call signal
c. Protect the client from injury
d. Keep the client warm

Nine domain: Disinfection and Sterilization

1- After completing the steam sterilization cycle, wrapped, sterilized items should be :

A- Sterilized materials and packages are placed on a metal table

B - Can be used immediately

C - It takes 30-60 minutes to cool down

D- Materials need from (15-30) to cool down

2 - A nurse is preparing a sterile field for a confused patient, when accidental touch occurs for the sterile equipment, what is the proper action in this situation ?

A. Ask another nurse to hold the hand of the patient and continue setting up the field.
B. Remove the instrument that was touched by the patient and continue setting up the sterile field.
C. Discard the supplies and prepare a new sterile field with another person holding the patient's hand.
D. No action is necessary since the patient has touched his or her own sterile field.

3 – When the nurse try to pour fluid in the sterile field. What is a proper way to performed that to maintain the field sterility ?

A. Place the bottle cap on the table with the edges down.
B. Hold the bottle inside the edge of the sterile field.
C. Hold the bottle with the label side opposite the palm of the hand.
D. Pour the solution from a height of 4 to 6 inches (10 to 15 cm).

4- Sterilization process for surgical instrument which should be fallowed are :

a. Wash, disinfectant in glataraldehyde solution, then sterilized with ethylene oxide
b. Wash, disinfection in hydrogen peroxide solution, then undergoing plasma sterilization
c. Rinse, machine processed disinfected, then send for sterilization
d. Cleaning, packing, and sterilization .

5- The best way to sterile the surgical instruments after cleaning from the soil is :

a. Boiling

b. Dry heat

c. Heat and steam

Appendix: (7)

List of experts

ت	اسم الخبير	اللقب العلمي	الاختصاص	مكان العمل	سنوات الخبرة
1	د. أمين عجيل ياسر	أستاذ	تمريض صحة الاسرة والمجتمع	جامعة بابل/ كلية التمريض	37
2	د. راجحه عبد الحسن حمزة	أستاذ	تمريض البالغين	جامعة الكوفة/ كلية التمريض	37
3	د. حسين هادي عطية	أستاذ	تمريض البالغين	جامعة بغداد/ كلية التمريض	36
4	د. حكيمة شاكر حسن	أستاذ	تمريض البالغين	جامعة بغداد/ كلية التمريض	32
5	د. شذى سعدي محمد	أستاذ	تمريض البالغين	جامعة بابل/ كلية التمريض	24
6	د. خالدة محمد خضير	أستاذ	تمريض البالغين	جامعة بغداد/ كلية التمريض	21
7	د. حسام عباس داود	أستاذ مساعد	تمريض البالغين	جامعة كربلاء/ كلية التمريض	21
8	د. ماهر خضير هاشم	أستاذ مساعد	لغة عربية	جامعة بابل/ كلية التمريض	15
9	د. صادق عبد الحسين حسن	أستاذ مساعد	تمريض البالغين	جامعة بغداد/ كلية التمريض	12

Appendix: (8)

Ministry of Higher Education and Scientific Research
University of Babylon
College of Education for Human Sciences

جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جامعة بابل
كلية التربية للعلوم الانسانية

Ref. No :
Date: / /

الواردة
العدد / ١٧٦١
التاريخ ٥ / ٧ / ٢٠٢٢

العدد : ٢٧٦
التاريخ : ٤ / ٧ / ٢٠٢٢

كلية التمريض
المعاون العلمي

الى / السيد معاون العميد للشؤون العلمية والدراسات العليا المحترم

الى/ مكتب السيد المعاون للشؤون العلمية المحترم

م/ تقويم لغوي

تحية طيبة //

أشارة الى كتاب جامعة بابل / كلية التمريض ذي العدد ٢١٩٤ في ٢٢/ ٦ /٢٠٢٢ نرسل اليكم رسالة: طالبة الدراسات العليا / الماجستير (رباب جليل وادي رشيد) بعد تقويمها لغويا من قبل (أ.م.د.حسين حميد معيوف) .

مع الاحترام

أ.م.د.حسين حميد معيوف
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جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جامعة بابل - كلية التمريض

معارف الممرضين المتعلقة بإجراءات السلامة في وحدات العناية الحثيثة بمستشفيات الحلة التعليمية

تقدم بها

رباب جليل وادي

الى/

مجلس كلية التمريض / جامعة بابل وهي جزء من متطلبات نيل درجة الماجستير في علوم التمريض

بإشراف

أ. د. سحر أدهم علي

صفر 1444هـ

ايلول 2022 م

الخلاصة/

الخلفية: إن الحاجة إلى أن يكون الممرضين على دراية بتدابير السلامة في المستشفيات هو موضوع مهم في التمريض كاستجابة للتغير السريع في بيئة الرعاية الصحية. تدابير السلامة ضرورية لممارسة آمنة رعاية ومختصة وبمهارة وبيئة عمل امنة. يتأثر دور ممرضين العناية الحرجة في سلامة المرضى بمتطلبات المرضى التي تحتاج إلى مراقبة مستمرة ودقيقة وتحليل ديناميكي للبيانات وتوقع حدوث مضاعفات.

الهدف: تقييم معارف الممرضين المتعلقة بإجراءات السلامة في وحدات العناية الحرجة بمستشفيات الحلة التعليمية.

المنهجية: صممت دراسة مقطعية وصفية لغرض تقييم معارف الممرضين المتعلقة بإجراءات السلامة في وحدات العناية الحرجة بمستشفيات الحلة التعليمية، وقد أجريت هذه الدراسة من الفترة ما بين (19. تشرين الاول 2021 إلى 2. ايار 2022). عينة غير احتمالية هادفة قوامها (150) ممرض رعاية حرجة و (70) أنثى و (80) ذكر يمثلون تقريبا جميع الممرضين الذين شاركوا في الرعاية المباشرة للمرضى. ولتحقيق أهداف الدراسة تم إعداد استبيان خاص يتكون من ثلاثة أجزاء، الخصائص الديموغرافية، المعلومات العامة، بينما يتكون الجزء الثالث من مجالات اجراءات السلامة المتكونة على (55) فقرة. ولقياس مصداقية الأداة المعتمدة في جمع العينة تم استعمال طريقة إحصائية وكان معامل الارتباط ($r = 0.706$) وهي مقبولة احصائيا.

النتيجة: أظهرت النتائج أن النسبة الأعلى 142 (94.7٪) من أفراد عينة الدراسة تتراوح أعمارهم بين (20-30) سنة، 80 (53.3٪) كانوا ممرضين ذكور، 83 (55.3٪) كانوا متزوجين. أظهرت النتائج أن معظم المشاركين 85 (56.7٪) كانوا من حملة درجة البكالوريوس و 96 (64.0٪) كانوا من سكان الريف، ومعظم عينة الدراسة 89 (59.3٪) لديهم خبرة سنة واحدة في مجال الرعاية الحرجة.

الاستنتاج: اظهرت نتائج الدراسة ان مستوى المعرفة لدى المشاركين غير كافية فيما يخص إجراءات السلامة.

توصية: يوصى بإقامة برامج تعليمية لتطوير معارف الممرضين فيما يتعلق بإجراءات السلامة.