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Knowledge, Attitudes and Perceived Barriers to Infection Control Regarding COVID-19 Among Nurses in Al-Hilla Teaching Hospitals.

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By

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بسمِ اللهِ الرحمنِ الرحيمِ

يُسَبِّحُ لِلَّهِ مَا فِي السَّمَاوَاتِ وَمَا فِي الْأَرْضِ الْمَلِكِ الْقُدُّوسِ الْعَزِيزِ الْحَكِيمِ ﴿١﴾ هُوَ الَّذِي بَعَثَ فِي الْأُمِّيِّينَ رَسُولًا مِنْهُمْ يَتْلُو عَلَيْهِمْ آيَاتِهِ وَيُزَكِّيهِمْ وَيُعَلِّمُهُمُ الْكِتَابَ وَالْحِكْمَةَ وَإِنْ كَانُوا مِنْ قَبْلُ لَفِي ضَلَالٍ مُبِينٍ ﴿٢﴾

صَدَقَ اللهُ العلي العَظِيم

سورة الجمعة الآية رقْم (2,1)

Dedications

All praise to Allah, today we fold the days' tiredness and the errand summing up between the cover of this humble work.

To the Spring that never stops giving, to my mother who weaves my happiness with strings from her merciful heart...

my mother.

To whom he strives to bless comfort and welfare and never stints what he owns to push me in the success way

dearest father

To whose love flows in my veins, and my heart always remembers them, to my brothers and sisters.

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Summary

Background: COVID-19 pandemic is a major health crisis that emerge at the end of the first quarter of the twentieth one century that had changed the lives of millions of people globally.

Objectives: The purpose of the study is to assess nurses' knowledge, attitudes regarding COVID-19 and Identify the barriers to infection control perceived by nurses regarding COVID-19, further to find out the differences in nurses' knowledge attitudes and perceived barriers of infection control of COVID-19 in regards to their socio-demographic characteristics. In addition, to find out the correlation between knowledge and attitudes and the barriers to infection control perceived by nurses.

Methodology: A descriptive cross-sectional study was conducted in Al-Hilla Teaching Hospitals at Al-Hilla city from 25th September 2020 to 15th March 2022. A convenient (non-probability) sample was selected 200 nurses who were working at these hospitals.

Results: The result of the study was showed that more than half of nurses (58%) have poor knowledge related to COVID-19, the majority of them(86 %) are express a positive attitude, and most of the nurses (74.5 %) have express a high level of barriers towards infection control of COVID-19. There are a significant correlation (positive) between nurses' knowledge towards COVID-19 in regard to their attitudes, and between the nurses' knowledge and perceived barriers of infection control regarding COVID-19 and in same regard the relations between nurses' attitudes and their perceived barriers of infection control

Conclusions: Nurses have poor knowledge, express positive attitudes and high level of barriers towards the prevention of COVID-19

Recommendations: Encourage all the nurses in epidemiological wards to involve in educational courses to raise their level of knowledge regarding general information and the main principles concerning COVID-19

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List of Abbreviations

Item	**Meaning**
ACE2	Angiotensin-converting enzyme 2
ADE	Antibody-dependent enhancement
AKI	Acute Kidney Injury
ANOVA	Analysis of variance
Anti-S-IgG	Virus-anti-S protein-neutralizing antibodies
ARDS	Acute respiratory distress syndrome
BAL	Bronchoalveolar lavage fluid
BCV	Neonatal calf diarrhea coronavirus
BiPAP	Bilevel positive airway pressure
CDC	Centers for Disease Control and Prevention
COPD	Chronic obstructive pulmonary disease
COVID-19	Coronavirus disease 2019
CoVs	Coronaviruses
CPAP	Continuous positive airway pressure
CT	Chest computed tomography
DF	Degree of freedom
DVT	Deep vein thrombosis
ECMO	Extracorporeal membrane oxygenation
EMRO	Eastern Mediterranean Regional Office
EUA	Emergency Use Authorization
F	F-Statistic
FcR	Fc receptors
FDA	Food and Drug Administration
H.S.	High significant
HCP	Healthcare Personnel's
HCWs	Health Care Workers

HEPA	High-efficiency particulate air
HFNC	High-Flow Nasal Cannula
HIT	Heparin-induced thrombocytopenia
IBV	Infectious Bronchitis Virus
ICN	International Council of Nurses
ICU	Intensive care unit
IMOH	Iraq Ministry of Health
IMV	Invasive mechanical ventilation
IP	Infection prevention
IPC	Infection prevention and control
KAP	Knowledge, attitudes, and practices
M.S	Mean of score
MERS	Middle East Respiratory Syndrome
MHV	Mouse Hepatitis Virus
N.S	Not significant
NAATs	Nucleic acid amplification tests
NIH	National Institutes of Health
NIPPV	Noninvasive Positive Pressure Ventilation
NMBA	Neuromuscular blocking agents
OSA	Obstructive sleep apnea
P. value	Probability value
PE	Pulmonary embolism
PEEP	Positive end-expiratory pressure
PHNs	Public Health Nurses
PPE	Personal Protective Equipment
r	Correlation coefficient
RAS	Renin-angiotensin system
RCV	Rat coronavirus

RNA	Ribonucleic acid
RT-PCR	Transcription polymerase chain reaction
RT-qPCR	Real time quantitative polymerase chain reaction
S.	Significant
SARS	Severe Acute respiratory Syndrome
SARS-CoV-2	Severe acute respiratory syndrome coronavirus 2
SD	Standard deviation
Sig	Significance
SpO2	Oxygen saturation
SPSS	Statistics Package for the Social Sciences
TGEV	Transmissible pig gastroenteritis virus
TNF	Tumor necrosis factor
T-test	Hypothesis test statistic
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
USA	United States of America
VEGF	Vascular endothelial growth factor
VITT	Vaccine-induced immune thrombotic thrombocytopenia
VTE	Venous thromboembolism
%	Percent
WHO	World health organization

Chapter One

Introduction

Chapter One

Introduction

1.1. Introduction :

Coronaviruses (CoVs) have been associated to severe disease epidemics in East Asia and the Middle East during the previous two decades. In 2002 and 2012, respectively, the severe acute respiratory syndrome (SARS) and the Middle East respiratory syndromes (MERS) initial appeared. A novel-corona-virus, the severe-acute-respiratory-syndrome coronavirus (2) (SARS-CoV-2), has arisen in late (2019), producing the Coronavirus Disease- 2019 (COVID-19), a worldwide healthiness danger with its continuing epidemic in many countries and regions (Rodriguez-morales *et al*., 2020)

The cases of pneumonia are unknown that were stated to the World Health Organization (WHO) on December 31, 2019 in Wuhan, China. Coronavirus-2, that reasons (severe-acute-respiratory-syndrome), was identified as the pathogen(SARS-CoV-2). On (March 11th, 2020), they proclaimed coronavirus disease (2019) (COVID-19) a globally as a pandemic (Huang *et al*., 2020).

The worst-affected countries have been China, the United States of America, Europe, and Iran. The disease has even crossed the border into India. With a population of over (1.3) billion people, India might very well become the next hub of the epidemic. Since March 25, 2020, a countrywide lockdown has been in effect across the country in an struggle to stem the virus blowout. Even still, the virus is quickly spreading in India, with 70,756 confirmed cases as of May 12, 2020 (Omer *et al*., 2020).

To manage the epidemic, China promptly declared a state of emergency and implemented a number of unprecedented measures, including enforcing a lockdown on Wuhan, over the extended Spring Festival national holiday. At the same time, the entire country was subjected to a variety of additional measures, including strict in-door lockdown, person-to-person

health checks, enormous disinfection, widespread public health education initiatives, even school and workplace closures (Peng *et al*., 2020).

Europe was the most severely impacted, accounting for more than half of all cases and 60% of all deaths. The United States has the most cases 695,350, as well as the most fatalities, in the world 32,427 deaths. With 13,892 cases and 628 deaths, the African area is the least impacted, although the numbers are rising (WHO., 2020 b) .

The Saudi Ministry of Health (MOH) confirmed the first positive case on March 2, 2020, and many of patients in the kingdom quadrupled in a month, creating a serious problem for healthcare providers (Khitam., 2020).

According to the Iraqi Ministry of Health, COVID-19 was first found in an Iranian resident undergraduate in Najaf City on February 24, 2020. Then, additional cases were recorded among Iraqi people, especially among those who had been backed from Iran, and the number of confirmed cases transferred locally began to climb day by day in other Iraqi cities, including Baghdad, due to high laboratory testing capability (WHO: Eastern Mediterranean Regional Office (EMRO); Iraq's Ministry of Health (IMOH)., 2020).

As a result, the Iraqi Government and Ministry of Health, in teamwork through the Committee for Health and National Safety and the Kurdistan Regional Government, have taken a number of measures to try to limit the spread of the outbreak, including closing schools, universities, general shopping centers, movie theaters, and prohibiting public gatherings, including all major religious gatherings, as well as banning travel from infected areas (Iraqi government, 2020).

More stringent regulations have been implemented, including the prohibition of commercial outlets with Iran and Kuwait, as well as curfews in all Iraqi governorates and the prohibition of traveling between governorates, as well as the suspension of all airport operations (United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA)., 2020).

The SARS-COV-2 is spread from (person to another person) by direct touch(within two meter) via respirational droplets in coughing and sneezing, in addition to contacting virus-contaminated surfaces or objects. The presence of chronic diseases and old age have both been highlighted as possible risk factors for severe disease and fatality (Li *et al*., 2020).

The virus takes 2–14 days to incubate, and the majority of patients 80% have minor symptoms that do not require medical attention. About 20% of COVID-19 patients had serios disease, such as dyspnea, sepsis, septic shock, and system failure, and near 2% of patient were deadly (Centers for Disease Control and Prevention (CDC) 2020 a).

Fever, dry coughing, and tiredness are frequent COVID-19 symptoms, which can develop to more serious symptoms such as trouble breathing, chest discomfort, difficulty speaking, and moving . SARS-CoV-2 is disseminated by bodily fluid droplets from the mouth or nose, that can transferred when a COVID-19 patient coughs, sneezes, or speaks. Droplets can't go more than two meter in most cases (almost two meters). SARS-CoV-2 may be suspended in the air for up to three hours and stays intact and infectious(WHO., 2020 c).

Contaminated droplets can also stick to surfaces including plastic, stainless steel, copper, and cardboard. If a person touches a surface contaminated with SARS-CoV-2 items and then comes into contact with mucous membranes such as the eyes, nose, or mouth, they can get infected. As a result, health professionals recommend that you wash your hands often with soap and water (WHO., 2020 c).

As a result, preventing the spread of this contagious disease within hospitals is a top responsibility. During the current epidemic, the (WHO) has released various guidelines and begun online courses and training sessions to promote awareness and prepare Health Care Workers (HCWs) for the inhibition and managing of COVID-19 (Bhagavathula, *et al*., 2020).

Nurses are essential members of the health-care system and team. All health care practitioners, particularly nurses, are fighting this pandemic on the front lines and delivering services to patients that will assist to avoid and control the COVID-19 pandemic, everyone is appreciative to everyone corona warriors, particularly nurses, who are working around the clock, away from their families, and putting their lives in danger to battle this pandemic. There were seen extraordinary examples of overwork by nurses directly involved in the COVID-19 pandemic response. India has just 1.7 nurses per 1000 people, which is 43% less than the global average 3 per 1000. Overall, India has 3.07 million registered nursing workers, which includes nurses, midwives, lady health visitors, and auxiliary nurses and midwives (India's shortage of doctors (ISD)., 2020).

According to many references, through the initial seasons of the COVID-19 disease, China implemented preventative and control measures that saved more than 700,000 cases across the country (Tian *et al*., 2020).

Despite the rules for preventing COVID-19 transmission, healthcare professionals reported a range of challenges. There were indications of an insufficiency of personal protective equipment (PPE), poor quality PPE, scarce medical supplies, staffing shortages, poor training, lack of adherence, poor practice of infectious disease prevention (IP) measures, misinformation and social stigma, potential for violence, non-compliance with physical distancing, and anxieties of non-payment sick leave as a result of this (Sharifi *et al* 2020; Hailu *et al* 2021).

Furthermore, overload in the healthcare organizations in entirely diverse setting, intense workload, anxiety of being ill and contaminating others, and a sense of powerlessness in dealing with the patient's condition are also factors to consider (Zeng & Zhen. 2020).

Dealing with highly units, prolonged working times, and poor hand-hygiene, as well as a lack of understanding about COVID-19 and deviations from the prescribed PPE put on and removing routine, all enhance the risk of

contracting SARS-COV-2. According to a recent research, 90 percent of observed doffing was improper; typical mistakes included trying to wear the gown from front, removing the mask's face cover, and contacting potentially infected objects and PPE (Wang *et al*.,2020; Phan *et al*.,2020).

As the COVID-19 epidemic spreads over the world, specialized administration, direction, monitoring mechanisms, and routine daily environmental disinfection have all been absent (Schwartz *et al.,* 2020; Otter *et al.,* 2014).

The biggest concerns through the worldwide were providing effective treatment to COVID patients and preventing infection transmission among healthcare workers and the general public. COVID-19 infection precautions measures have not been implemented well in all areas, and adherence to them is inconsistent (Suleiman *et al.,* 2020; Saitoh *et al.,* 2020).

Furthermore, the adoption of novel rules comes with its own set of problems, such as the availability of sources, equipment availability, skill with the equipment, training programs, and desire to participate. These characteristics are impacted by healthcare personnel's (HCP) knowledge, attitudes, and practices (KAP) on the disease and the new rules that will be implemented into their daily job (Houghton *et al* 2020; Gershon *et al* 2018).

1.2. Importance of the Study:

Coronavirus Disease 2019, is a rapidly spreading pandemic triggered by a new human-coronavirus. It was originally reported in December 2019 among cases with viral-pneumonia in Wuhan, China, and has since become the globally most common dangerous health crisis (Guan, 2020 a; WHO.,2020 f)

Nurses are on the front lines of COVID-19 pandemic protection, and because of their intimate interaction with and care for patients, they will be exposed to infected persons on a regular basis (WHO.,2020 g).

The WHO encourages that HCWs and patients' close relatives be protected to prevent the disease from spreading. Hand cleaning, social

distance, and post - exposure prophylaxis (covering mouth and nose once coughing and sneezing) are all primary preventative practices (Guan, 2020 b).

Overcrowding, a lack of isolation capabilities, and a dirty atmosphere all contribute to the disease's spread among caregivers, which is likely aided by nurses' lack of knowledge and awareness of exposure control methods (Wu, 2020).

Nurses should be aware of the virus and infection control procedures to avoid dissemination, given that people occupied in health care setting are at a greater danger of minor contamination or transferring the virus to coworkers, relatives, and families. However, actual evidence suggests that COVID-19 is a burden to nurses owing to the virus's strangeness, an insufficient information, training, and courses about how to manage the patients infected with the virus, and the psychological stress caused by patients mortalities. Because COVID-19 is such a novel virus, nurses' misinterpretation of its signs and symptoms, as well as inappropriate treatment, may accelerate the spread of disease in hospitals (Buerhaus *et al*., 2020; McCloskey *et al*., 2020).

In reality, there is a lack of data on nurses' perceptions, attitudes, and understanding of the COVID-19 epidemic. As a result, it's critical to determine what nurses know about the virus, as well as what they know about pandemic consequences and illness prevention. According to another research, nurses' perspectives differ as the patient progresses through the condition. Nurses may also have differing perspectives on COVID-19, resulting in a variety of clinical care practices and results. Nurses must get a strong understanding of the illness process in order to play a larger role in disease management. To accelerate beneficial results, nurses must understand and respond to COVID-19 (Patiraki *et al*., 2014).

There is none logical indication on nurses' knowledge and attitudes concerning this condition in Iraq yet. Nurses are an important element of the disease transmitting/care chain since they are in close contact with COVID-

19 patients as first-line practitioners. If awareness is power, knowing more about factors associated, what to do to obtain knowledge, precautionary measures, attitudes, and perspectives of nurses about the COVID-19 epidemic in nation can assist break the transmitting chain in a best way. However, the rise in COVID-19 incidence in Iraq, as well as the necessity to speed up the country's pandemic outbreak control(Hessels *et al*.2020). The figure (1-1) showed the timeline of number of COVID patients among nursing staff in Iraq (IMOH., 2020).

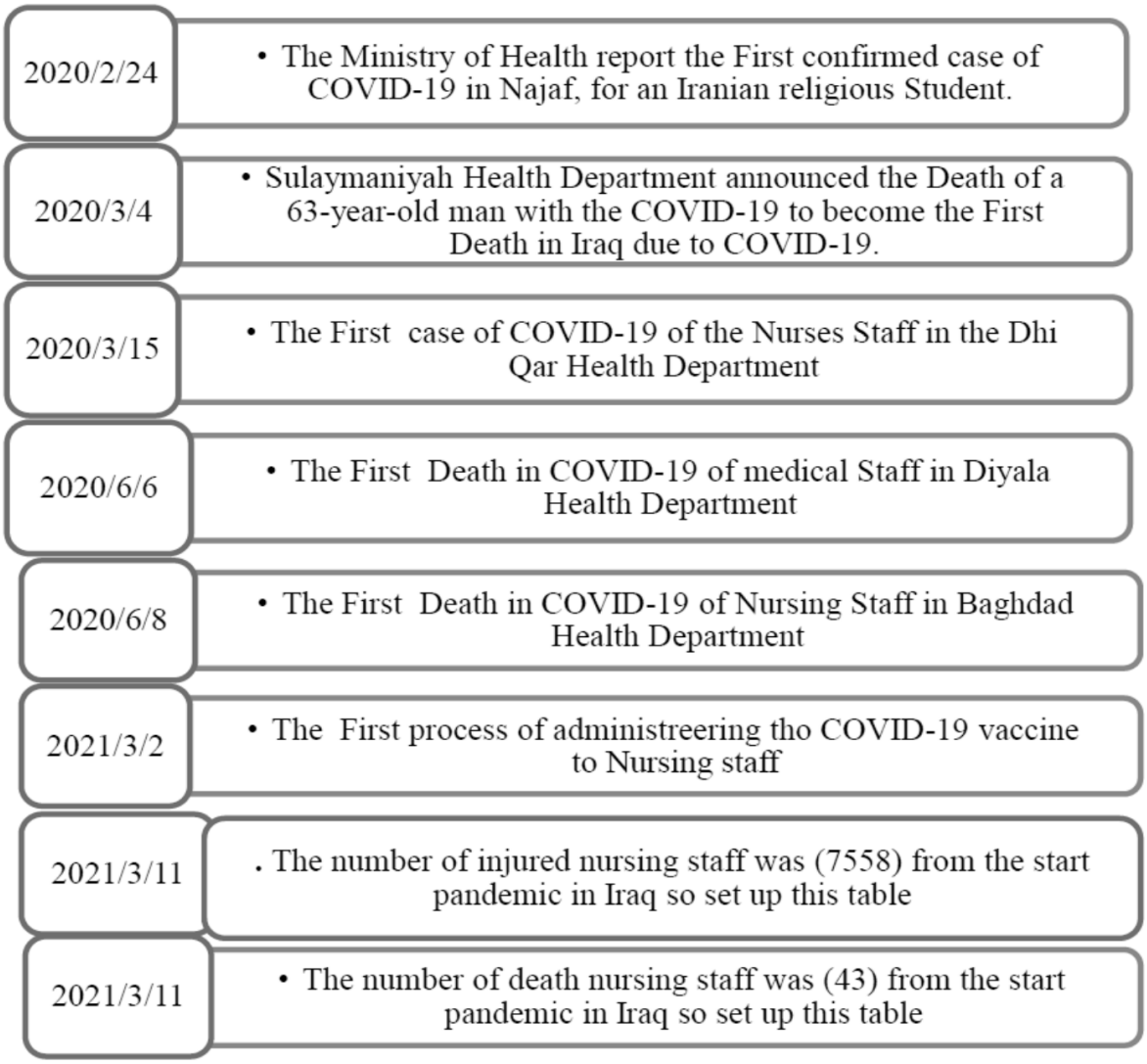


Figure (1)Timeline of the key COVID-19 events in Iraq

1.3. Problem Statement:

Nurses are an important part of the disease transmitting/care chain since they were in close contact with COVID-19 patients as first-line practitioners. If awareness is power, knowing more about factors associated, what to do to obtain knowledge, precautionary measures, attitudes, and perspectives of nurses about the COVID-19 epidemic in nation can assist break the transmitting chain in a best way. However, the rise in COVID-19 incidence in Iraq, as well as the necessity to speed up the country's pandemic outbreak control, are both vital issues that necessitate an understanding of in what way nurses realize the disease at this serious instant.

1.4. Objectives of the Present Study:

The present study aims to:

1.4.1. Assess knowledge regarding COVID-19 among nurses.

1.4.2. Assess attitudes regarding COVID-19 among nurses.

1.4.3. Identify the barriers to infection control perceived by nurses regarding COVID-19.

1.4.4. Find out the differences in nurses' knowledge attitudes and perceived barriers of infection control of COVID-19 with regards their selected demographic variables (age, educational level, years of employment in nursing, experiences in epidemic units, sources of information COVID-19 and training courses related to infection control) .

1.4.5. Find out the correlation between knowledge and attitudes and the barriers to infection control perceived by nurses.

1.5. Research Questions:

1.5.1. Are there knowledge, attitudes and perceived barriers to infection control among nurses regarding COVID-19 ?

1.5.2. Are there significant differences in nurses' knowledge attitudes and perceived barriers of infection control of COVID-19 with regards their selected demographic variables?

1.5.3. Are there significant correlations between knowledge and attitudes and the barriers to infection control perceived by nurses?

1.6. The hypothesis of the study:

1.6.1. Null hypothesis:

1.6.1.A. There is no knowledge, attitudes and perceived barriers to infection control among nurses regarding COVID-19.

1.6.1.B. There are no significant differences in nurses' knowledge attitudes and perceived barriers of infection control of COVID-19 with regards their selected demographic variables.

1.6.1.C. There are no correlations between knowledge and attitudes and the barriers to infection control perceived by nurses at p-value ≤ 0.05.

1.6.2. Alternative hypothesis:

1.6.2.A. There are a knowledge, attitudes and perceived barriers to infection control among nurses regarding COVID-19.

1.6.2.B. There are a significant differences in nurses' knowledge attitudes and perceived barriers of infection control of COVID-19 with regards their selected demographic variables.

1.6.2.C. There are a significant correlations between knowledge and attitudes and the barriers to infection control perceived by nurses at p-value ≤ 0.05.

1.7. Definitions of terms in the study :

1.7.1. Knowledge:

A. Theoretical Definition of the Term:

It is the ability to perceive, find, or learn information ; it is a combination of cognition, experience, and skill that is obtained by experience or education through observing, understanding, or learning (Anderson *et al*., 2017).

B. Operational Definition of the Term :

It’s the accumulation of all experiences , information that used in dealing with the patients have COVID-19 in epidemic units with different

situations including signs and symptoms , complications and also infection control practices.

1.7.2. Attitudes:

A. Theoretical Definition of the Term:

The evaluative judgements that synthesize and characterize these conceptual processes are known as attitudes. The power of these evaluative conceptions varies, which has consequences for persistent, rejection, and attitude-behavior stability (Crano and Prislin, 2006).

B. Operational Definition of the Term:

The feeling predisposition of nurses working in epidemic units to assess the intensity of their anxieties of becoming ill or infecting their families with Covid-19 or other issues associated to this virus, and to rate it favorably or unfavorably.

1.7.3. Perceived Barriers:

A. Theoretical Definition of the Term:

Perceived barriers are a person's evaluation of the degree of difficulty of sociological, personal, environment, and economical hurdles to a certain activity or their desired objective status on that conduct (Glasgow, 2008).

B. Operational Definition of the Term:

The extent of social, physical, ecological, and financial burden that inhibits epidemic units nurses from conducting infection control procedures.

1.7.4. Infection Control:

A. Theoretical Definition of the Term:

It is the use of processes and practices to decrease or eradicate the transmission of healthcare-associated illnesses. When interacting with any patients, infection control methods include systems that include cleanliness and protective clothes, disinfection and disposal processes, and standard precautions (Shaw, 2006).

B. Operational Definition of the Term:

It's the practices and skills of the nurses who working in epidemic units to decrease or remove the corona virus that cause COVID -19 by using precaution measurements that given by CDC and WHO and.

1.7.5. Nurses:

A. Theoretical Definition:

Healthcare professionals instructed and trained to promotion and maintenance of health through the diagnosing and management of acute and chronic conditions (ICN., 2015).

B. Operational Definition:

Nurses are considered as members of health-care supplier that had a specific knowledge, attitudes and practice to apply the nursing process through treating the patients with COVID-19 in epidemic units and acquire enough knowledge about infection control practices.

Chapter Two

Literature Review

Chapter Two

Literatures Review

The researcher was looked through the relevant literature and past studies to get a better understanding of the subject of the theoretical framework of the study, coronavirus pandemics including historical overview, epidemiology etc.. , and nurses' knowledge, attitudes and barriers of infection control and pervious study related the study.

2.1. Theoretical Framework:

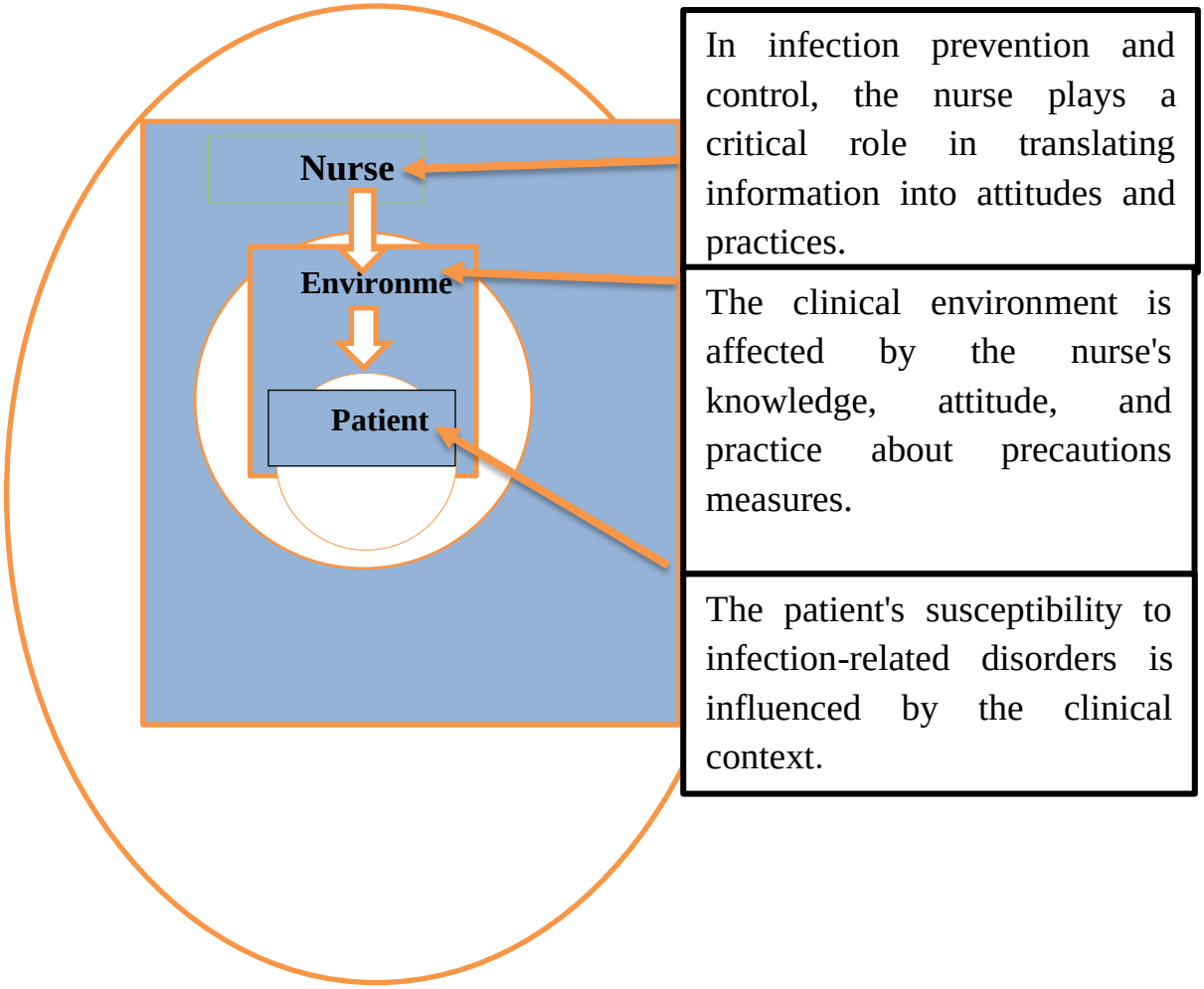
The environmental theory of Florence Nightingale was used in this research. The nurse's responsibility, according to Florence Nightingale, is to put the patient in the right place for nature to influence on him, so facilitating healing. According to the principle, the nurse must offer a clean surroundings for the patient (in this circumstance of contagion controlling and prevention). According to Florence Nightingale, there is a relationship between hygiene and illness spreading, showing the hand hygiene reduces rates of infection. Hand cleanliness is the most effective way to prevent contamination (Frello & Carraro, 2013).

2.1.1. Applying of Environmental Theory (Florence Nightingale's theory) Relate to Theoretical Framework.

Nurse: In infection control practices, the nurse plays a significant role in transferring the knowledge into attitudes. Using her knowledge and attitude about infection prevention and control, Nightingale implemented infection precautions and controlling measures that put patients in greatest probable place to recovery (Gurler, 2014).

Environment: Clinical environment is influenced by the nurses' knowledge, attitudes. The patient should be kept in a separate room. Hygiene (cleanness, sanitation) and contamination controlling and precautions procedures in medical setting, according to Nightingale, lead to higher health-care quality (Gurler, 2014).

Patient: healthcare environment is influenced by the nurses' knowledge,attitudes in contamination precautions measures and controlling, which then in turn influences on patient's vulnerability to infectious illnesses. Nightingale emphasized the significance of cleanliness and patient-care in contamination precautions and controlling, she specialized in caring for the sick (Gurler, 2014).



Figure(2-1): Florence Nightingale's environmental theory conceptual framework (Gurler, 2014)

2.2. Coronaviruses:

2.2.1. An Overview of SARS COVID-2

Coronaviruses are a cluster of zoonotic viruses which cause a wide variety of illnesses, Humans have been given the ability to transmit information through animals to people. Several coronaviruses have been discovered in animals who have not yet infected humans. COVID-19 is the most recent virus to be discovered in humans (WHO, 2019).

Coronaviridae infections have a separate, optimistic RNA genome that varies in length from 26 to 32 kilobases. Coronaviruses have been detected in camel, foxes, hooded desert civets, mice, dogs, and cats, among other avian and mammalian hosts. Today, new mammal coronaviruses are now being identified on a routine basis (2007, Cavanagh)

Gammacoronavirus, Deltacoronavirus, Betacoronavirus, and Alphacoronavirus are the four types of coronavirus that cause gastrointestinal diseases. It was followed by the MERS 2012 and, more lately, the COVID-19 outbreaks. SARS-CoV and MERS-CoV are viruses that spread through bats to palm civets and mammal horses, and subsequently to people. After infecting humans in Wuhan City's Huanan street market, SARS-CoV-2 was likely transmitted by bats, according to a phylogenetic research (Wan *et al*., 2020).

A pangolin, a night-time anteater illegally brought for its meat, may have served as the intermediate vector. Coronaviruses identical to SARS-CoV-2 are found in this species, but they differ in a clinical facility that affects viral infectivity and genetic variation. To explain how the virus spread so quickly, it's possible that it began as a human infection and then evolved as it affected more people (Corman, 2018).

There were a few hypotheses on where the first incidence originated (the so-called patient zero). The SARS-CoV-2 was found in

October and November 2019, as per genetic studies. It appears to be caused by a coronavirus which attacks migratory bats before spreading to humans via an intermediary mammalian host (Shield, 2020).

The first human infection happened in Wuhan, Hubei, China. The initial time of symptom beginning was documented as 1 December 2019 in a researching of the primary(41)confirmed patients with COVID-19, available in The Lancet in January 2020. (Horby *et al.*, 2020). Official WHO publications as of December 8, 2019 verified the initial start of indicators (Kuo, 2020).

In January 20, 2020, the WHO and Chinese agencies will still have confirmed human-to-human transfer. The majority of these incidents, as per official Chinese records, were linked to the Huanan Fish Open Market, that also sold animals. George Gao will be sworn in as President of the United States in May of 2020. According to the CDC's director, samples of animal taken from the sea-food bazaar proved negative of virus, demonstrating the bazaar was the source of the primary spreading case but-not the initial epidemic. Virus was found in waste water collected on the 18th of December in Milan and Turin, Italy (Kelland, 2020).

Until the (month 12) 2019, person for person spreading was virtually completely responsible for the spread of illness. The amount of coronavirus cases in Hubei rapidly grew, accounting 60 by Dec. 20 and at minimum 266 by Dec. 31 (Surveillances, 2020).

The first public warning of an outbreak of pneumonia with an unknown cause was released by the Hubei City Health Commission. on December 31, confirming 27 cases and triggering an inquiry (Tavakoli *et al.*, 2020).

2.2.2 . Historical background:

From the First International Congress in Germany about Coronaviruses in 1992 to the Present, the relevance of the coronavirus family in medical and commercial aspects has grown dramatically (1980). The use of current molecular, natural science and immunology has assisted in the development of new understandings about the status of viruses and the pathophysiology of illnesses that origin it (Weiner 1987).

The virus has upset the interest of veterinary, medical, and fundamental scientists from its inception, It has centered on the viruses' obvious pathogenicity for the intestinal system, respiratory, and nervous system. Baudette and Hudson, who documented "gasping disease" in chickens and then transferred the ailment to embryos in 1933, are most likely a first professional observations (Beaudette & Hudson 1933).

For a long time, gasping illness was assumed to be a terrifyingly lethal respiratory ailment. Later, this virus was recognized as a respiratory syncytial virus (IBV), which formed the foundation for the virus families. The identification of the mouse hepatitis virus provided the stage for more investigation(Gledhill *et al*., 1952).

Coronaviridae, a novel family containing one genus coronavirus, was described by the Worldwide Committee on Disease Taxonomy in 1975. A number of novel viruses have-been found, counting canine coronaviruses, slinky peritoneal inflammation and intestinal coronaviruses, as well as pig gastroenteritis, newborn calf diarrhea and rat coronaviruses. This was the title of a 1980 assessment of the First International Congress on Coronaviruses. was written by Mahy (Sturman & Holmes 1983).

Scientists who investigate the pathophysiology of both human and animal viral infections might benefit from this conference, which establishes standards for corona-virus molecular-biology (Weiner 1987).

The SARS-CoV-2 coronavirus isn't the primary to cause respiratory sickness epidemics in humans. This is only the beginning; there are already six more that are suspected to have come from mammals (Andersen *et al*., 2004).

Common colds are caused by four coronaviruses, which are now common in humans and peak in temperate regions between December and April (Corman *et al*., 2018)

The epidemic had generally been controlled on July 2019, and the last cases in China were only discovered in April of the same year. This virus was responsible for Severe-Acute-Respiratory-Syndrome is like a common cold sickness, as well as the frequent diarrhea that accompanied it. Approximately a quarter of those infected needed critical care within two weeks due to the possibility of developing pneumonia and respiratory failure, about 8098 cases were recorded and 774 people died (Hui & Zumla 2019).

According to pervious research, the SARS-CoV virus was first discovered in horseshoe bats and then transmitted to people through palm civet cats that were illegally imported into China and slaughtered there for food. Coronaviruses were also responsible for the Middle Eastern Respiratory Syndrome outbreak (MERS). It was exposed in Saudi Arabian in 2012 that the MERS-CoV virus was responsible for a lethal sickness (Azhar, *et al*., 2019).

2.2.3. Virology:

The Ribonucleic acid (RNA) viruses with a positive strand enclosed in a capsule are known as coronaviruses. The coronavirus that produces COVID-19 is a beta-coronaviral, so same subgenus as the SARS virus, regarding to complete decoding and phylogenic research (and other bat coronaviruses). The International Commission on Virus Taxonomy's Coronavirus Research Group has recommended the name

SARS-CoV-2 for this infection severe-acute respiratory syndrome coronavirus 2 (Zhu *et al*., 2020).

Another beta-coronavirus, the Middle East respiratory disease (MERS) virus, appears to be more distantly related. The closest RNA sequence match is found in two bat coronaviruses, indicating that bats are the major source; however, it is unclear whether COVID-19 virus is transmitted directly from bats or through an intermediary host (such as a mosquito) (Zhou, *et al*., 2020).

The same host target for SARS-CoV-2 cell entry as it is for SARS-CoV is angiotensin-converting enzyme 2 (ACE2). The SARS-spike CoV-2 protein's receptor-binding region interacts with ACE2. The cellular enzyme TMPRSS2 leads to enhanced SARS-CoV-2 cell entry (Hoffmann, *et al*. 2020).

2.2. 3. 1. Variants of Concern:

In the same way that viruses mutate, SARS-CoV-2 does the same. Virus function is unaffected by the bulk of the SARS-CoV-2 genome's changes. These "variants of concern" have drawn a lot of attention due to their rapid spread across populations and indications of transmission or clinical effects. Labels based here on Greek alphabet have been issued by the WHO for major deviations. According to various evolutionary classification methods, each variation is known by a variety of names (WHO j., 2020).

2.2.3.1.1. Alpha(B.1.1.7lineage):

This modified, similarly recognized as(20I/501Y.V1), was initially detected late 2020 in UK and was connected to an growth in district cases at the time.)This strain encompasses a more of twelve a differences from other strains in circulation, including those seen in the protein’ spikes. It was later found in a number of countries, including the United States. According to numerous studies, Alpha is 50 to 75 %

greater communicable than recently prevalent strain, and is connected to higher secondary attack rates e.g., 13 vs 10 percent (Meyer *et al*., 2021).

The cause of the increased transmissibility is unknown. According to several studies, In comparison to wild-type variants, Alpha was related by a greater average viral RNA level in breathing droplets, and viral RNA can be identified in respiratory samples for a lengthier length of time. The researchers are investigating if these results have been connected to enhanced spread and the changes that are responsible for it. responsible. In a mouse model, one of the Alpha version's alterations, N501Y, increased SARS-CoV-2 infectivity in the spike-protein's receptor-connecting field. Another spike protein variant, P618H, sits just next to the furin-cleavage place, that is believed to be crucial to SARS-CoV-2-cell access (Gu *et al*., 2020; Frampton *et al*., 2021).

Some research suggest that the Alpha variant is connected to a higher likelihood of illness severity, although not all. At this time, There is no indication that the Alpha variation is linked to immunologic escaping that is clinically meaningful. Many research have shown a serum from COVID-19 vaccination users contains anti-Alpha action, and that some vaccines are indeed effective against it (Davies *et al*., 2021; Muik, *et al*.,2021).

2.2.3.1.2. Delta (B.1.617.2 lineage):

These branch commonly referred for example (20A/S:478K), was discovered at Dec of (2020) at India had now converted the utmost common in the US. and UK. The Delta type seems to be more transmissible than the Alpha kind, according to data. According to UK research, the percentage the number of SARS-CoV-2 diseases triggered by Delta increased as the Alpha decreased, and the second population rate of infection linked to Delta disease was 13.6% equated to 9.0% to Alpha. The Delta variant was associated to a 53% household attack rate

in another analysis from a small pandemic in the United States (Dougherty *et al*., 2021).

According to an unreported Chinese research, Delta's first lung area virus-related RNA points are roughly 1000 periods sophisticated from the original virus circulating during the early stages of the pandemic. Delta infection has been associated to a higher risk of hospitalization than Alpha infection, according to studies (Sheikh, *et al*., 2021).

2.2.3.1.3. Omicron (B.1.1.529 lineage):

The first nation to report this variation was Botswana, which was followed by South Africa in November 2021. It was detected in a number of other countries after it was connected to an increase in regional illnesses in South Africa (CDC., 2021 g).

The replication rate of Omicron appears to be higher than that of Delta. Omicron was originally detected in the United Kingdom during a period when cases caused by the Delta variety were the most common; however, according to a study by the UK Well-being Safety Agency, following increase in situations triggered by Omicron exceeded the growth in situations produced via Delta (WHO., 2021 a).

The study also found that Omicron had a larger home Omicron has a higher secondary base attack over Delta (19% vs. 8%); nevertheless, so because prediction was based on a small amount of indicator instances, the true base attack for Omicron is unclear. The replicating benefit of the Omicron variant might be owing to immunological escaping, whether the variant is fundamentally more transmissible is uncertain (WHO., 2021 b).

2.2.4. Epidemiology:

Due to their inability to survive in humanity, SARS-CoV, MERS-CoV, or SARS-CoV-2 might blowout via other pathogenic

animals, with epidemics developing in the sometimes vulnerable human community(Su, *et al*., 2016).

Even if the initial and intermediary animals hosts for SARS-CoV-2 had up till now identified, virus's phylogenetical similarity to bat coronaviruses implies that this new virus is linked to bat coronaviruses. According to extensive clinical evidence, SARS-CoV-2 was proved to be transferred through person to person in Jan 2020. The virus's relatively high infectivity and transmission mode (upper respiratory) (which may also include contact transmission), The existing worldwide travel pattern, together with the reasonably long incubation time and viral shedding phase, are all crucial ingredients for it to swiftly grow into an epidemic(Zhou, *et al*., 2020).

The SARS-CoV-2 was first suspected to infect people who went to the fish market or ate food prepared with diseased animals. Further examination and interaction outlining of COVID-19-positiving cases exposed that a amount of persons who had never visited a seafood market verified confident to illness. The outcomes revealed that the virus may be passed from person to person, which was eventually proven in over 200 countries worldwide. The possibility of human-to-human transmission of SARS-CoV-2 was confirmed in an epidemiological study of patients in a familial group. Members of a family went to Wuhhan (Chan *et al*., 2020).

The new coronavirus had a high incidence related human-to-human communication, resulting in a wide range of clinical symptoms in those exaggerated. SARS-CoV-2 has transferred crossways the city mostly as a result of public and cross-family spread, per this comprehensive study. Individual to- individual transferred of SARS-CoV-2 the most frequent when people are in close proximity to an diseased individual and are uncovered to coughing, sneezing, breathing droplets. These aerosols may cause lung injury if inhaled via the mouth

or nose. As with additional lung illnesses, SARS-CoV-2 is spread by droplets of varying sizes. Nuclei are less than 5 m in width, whereas breathing droplets are greater than five m in width (WHO.,2014 ; Xu, *et al*., 2020).

The SARS-CoV-2, according to new study, might spread in a range of methods. Human angiotensin-converting enzyme 2 (hACE2), the virus receptors, is present in a range of cell types, includes alveoli cells, endothelium in the vascular system, intestinal cells, and vital organs. SAR-CoV-2 affects the entire humanity since hACE2 is a key gene. There is no evidence that any hACE2 genetic variation is related to SARS-CoV-2 disease susceptibility. The SARS-CoV-2 is disseminated by droplets in the air during this time, according to several investigations (Anfinrud, *et al*., 2020).

The term "airborne transmission" refers to the spread of disease by microscopic droplets containing the virus that remain after larger droplets have dissipated. The aerial droplets linger in the air at extended period and may be conveyed between humans upright more than a meter apart. SARS-CoV-2, on additional hand, is regularly spread by breathing droplets and close connection. In fact, a comprehensive assessment of concluded 75,000 COVID effected role in China showed no sign of floating spread (WHO., 2020 i).

Particle transfer of SARS-CoV-2 occur when an individual gets in close touch (or less 1 m) with somebody who is spitting or sneezing. Sick droplets from the mucosal membranes of an infected individual (mouth and nose) or conjunctiva might spread the virus (eyes). Virus transmission via the conjunctiva is unusual, despite the fact that mucosal transmission is the most frequent (Peng & Zhou 2020).

Furthermore, SARS-CoV-2, like the other coronaviruses, has the potential to induce nosocomial epidemics as a mechanism of transmission via environmental contamination. Environmental

pollution's mechanism and magnitude, on the other hand, must be investigated further. In a well-protected isolation room. recently evaluated a range of fomites from patients, as well as superficial examples of items secondhand on ill people, PPE examples, and wipes, among other things (12 air exchanges per hour). Environmental pollution by respiratory droplets and fecal shedding by SARS-CoV-2-positive patients are potential issues for disease transmission, according to the research (Ong *et al*., 2020).

Fecal oral transmission is a potential since the SARS-CoV-2 has indeed been found in feces, indicating that the digestive system also was affected. SARS-CoV-2 has also been shown to invade conjunctival tissues, indicating the virus might spread in different ways. It's still unknown whether or not it's feasible to transfer a fetus from a mother to a child (Hui *et al*., 2020).

Nearly 222 million verified cases of COVID-19 have been registered globally at the time of writing this paragraph 10/9/2021. Since the earliest reports of There will be incidents from Wuhan, in Hubei Province, China, recorded on every country before the end of 2019. Case counts for COVID-19 are likely to be underestimates subsequently just a tiny fraction of cases are actually detected and reported. After taking into account any incorrect positively or negatively, sero-conversion research in the U.S. government and European demonstrate the amount of past contact to SARS-CoV-2, as stated by sero-positivity, surpasses the number of situations reported by about ten periods or extra, per the sero-prevalence (Stringhini *et al*., 2020).

2.2.5. Pathogenesis:

2.2.5.1.Virus Entry and Spread:

Pulmonary secretions, touch, and the likelihood of faecal matter contamination are the main methods of communication for

SARS-CoV-2. The respiratory system tract's mucosal epithelial (larynx and mouth) is assumed to be the site of primary viral replication, following by proliferation in the lower airways and digestive mucous, leading in a mild viremia (Xiao *et al*., 2020).

Only very few cases were currently within management and asymptomatic. Several people have experienced non-respiratory symptoms such serious heart and liver dysfunction, kidney failure, and diarrhoea, indicating that numerous organs are involved. The mucous membrane, bronchioles, chest, cardiac, esophageal, kidney, gastric,UB, and intestine all exhibit ACE2, making them susceptible to SARS-CoV-2. The SARS-CoV-2 could be detrimental to testicles cells, according to doctors, raising concerns regarding infertility in young adults (Zou *et al*., 2020: Fan *et al*., 2020).

2.2.5.2. Pathological Findings:

This is the initial description of pathology discoveries from a severing COVID-19 infection revealed lung widespread alveolar destruction with cellular fibromyxoid exudates on both sides. The lung had pneumocyte membrane damage and parenchymal lung formation, indicating severe respiratory distress. The development of lung oedema and pale membranes inside the left lung cells suggested initial severe respiratory distress (ARDS) (Xu, *et al*., 2020).

In both lungs, there were Lymphocytes dominate interstitial mononuclear inflammatory infiltrates In the intra-alveolar spaces, multinucleated syncytial cells with unusual expanded pneumocytes through big centers, amphophilical rough cytol, and conspicuous nucleoles were seen, suggesting cytopathic changes caused by a virus. These uncontrolled abnormalities in the lungs are strikingly comparable to persons found in SARS , MERS (Ng, *et al*., 2016).

Mild capillary steatosis and modest lobular and portal activity were seen in liver biopsy specimens, which might be caused by the

SARS-CoV-2 virus or drug use. In addition, just a few interstitial mononuclear inflammation infiltrations were seen in heart cells, suggesting that SARS-CoV-2 doesn't really impact the cardiac immediately (Xu, *et al*., 2020).

2.2.5.3. Acute Respiratory Distress Syndrome (ARDS):

The ARDS is a potentially deadly pulmonary disease in this insufficient oxygenation reaches and circulates in the lungs, leading to death of most respiratory illnesses and serious pulmonary damage patients. The ARDS problems were also associated with elevated levels of IL-6 & IL-8 in the bloodstream. All above evidence indicate to a biological reason for serious ARDS, and a possible treatment for ARDS induced by SARS-CoV-2 infection (Thompson *et al*., 2017).

Individuals with deadly Attacks with SARS-CoV, MERS-CoV, and SARS-CoV-2 cause serious breathing difficulties, necessitating artificial assistance, and histopathological results suggest ARDS (Ding *et al*., 2003).

2.2.5.4. Cytokine Storm:

Experimental evidence showed that during SARS-CoV-2 disease, excessive inflammation resulted in uncontrollable pulmonary inflammation, that was probably a primary cause of serious death. As shown in a recent review study, SARS-CoV-2 causes severe inflammation due to fast virus-related duplication besides cellular injury, viral-inducing ACE2 dysregulation & scattering, & antibodies dependency acceleration (ADE) (Fu, *et al*.,2020).

Rapid viral multiplication may initially induce widespread epithelium and endothelium cell damage, as well as vascular leaking, as a consequence of which pro-inflammations cytokine are released and chemokines (Yang, 2020).

Because ACE2 shedding and disregulation may result in reninn-angiotenssin system(RAS) failure, that could leading to increased inflammatory and vascular permeability, it has been postulated that damage of pulmonic ACE2 role is linked to serious pulmonic damage. One perplexing aspect of SARS-CoV is that only a minor percentage of cases, specifically individuals who make counteracting antibody early, endure prolonged inflammatory, ARDS, & even fetal, whereas the majority of Individuals are able to restore from the inflammatory responses & rid themselves of the infection. Contamination with SARS-CoV-2 had causes same effect. Recently, a possible basic apparatus for antibodies-dependentt improvement (ADE) was presented (Fu, *et al*.,2020).

Multiple viral infections have been found to have ADE, a well-known virology phenomena. Following contact Fc receptor(FcR), FcR, and another receptors, ADE may boost Infectious virus–antibody combinations are absorbed by the cells of the pathogen leading to more target cell infection (Takada & Kawaoka, 2003).

2.2.5.5. Immune Dysfunction:

The CD4 and CD8 T lymph cell peripherally decreased & hyper-activated in a severely state. Antiviral immune responses and T cell overactivation were also seen in large numbers of proin-flammatory CD4 T-cells& cytotoxic rough CD8 T cellular (Xu, *et al*., 2020).

According to many studies, lymphocytopenia is a shared symptom of COVID-19, showing that it is an important factor in predicting severity and death (Zhu *et al*.,2020).

2.2.6. Transmission:

The SARS-CoV-2 spreads mostly through person-to-person contact. Person to person A method of transmitting from one person to another. The major route of exposure for the severe acute respiratory

syndrome coronavirus 2 is straight individual respiratory transfer (SARS-CoV-2) (Meyerowitz *et al*., 2021).

Respiratory droplets that remain in the atmosphere for an extended period and travel a long ways may also transfer SARS-CoV-2 across longer distances, however it's unknown how this route of spread participate to disease (Chagla *et al*., 2021).

Several cases of SARS-CoV--2 have-been stated. The possibility long-distance airborne transmission has been underlined by many cases of SARS-CoV-2 epidemics in enclosed, poorly ventilated venues (such as a restaurant or a bus) (Lu, *et al*.,2020).

Experiments have also shown that aerial transmission is a viable option. Studies utilizing specialized imaging to observe respiratory exhalations, for example, have revealed that speaking, coughing, or sneezing can cause respiratory droplets to get aerosolized or transported in agas cloud, with horizontal trajectories exceeding six feet (two meters) (Stadnytskyi *et al*., 2020).

The COVID-19 patients with mild sickness have been shown to contain viral RNA in their respiratory systems and hospital room air tests, according to other studies. At this point, only successful air and surface specimens have been used to detect live virus on rare occasions (Ong *et al*., 2020; Zhou *et al*., 2020).

Nonetheless, SARS-overall CoV-2's transmission and secondary attack rates show that long-range airborne transmission is not the major method of transmission. No secondary infections were found in a insufficient instances health caring personnel unprotected to patients none-diagnosed a disorders although via just contacts & droplets protections, although the absence of floating safeguards (Chagla *et al*., 2021).

Airborne precautions in the healthcare environment differ by area because of the current uncertainty about the proportionate

contributions of various transmission routes; nonetheless, airborne precautions are always advised when aerosol-generating treatments are done. You may find more information about this topic in other places. Non-respiratory materials including as feces, blood, ocular secretions, and sperm have been identified to contain SARS-CoV-2, although their role in transmission is still unclear (Colavita *et al*.,2020).

Even when viral RNA couldn't anymore be located on the upper respiratory tract collections, SARS-CoV-2 RNA has been isolated from stool specimens in several investigations, In limited occasions, a deplicative virus has indeed been cultivated from excrement (Zheng *et al*., 2020).

The possibility of virus infection through sewage drain has been suggested by isolated instances of groups in a housing complex and a huge city with lack of sanitation (Kang *et al*.,2020).

As shown in a combined WHO-China research, transmission via the fecal-oral pathway had no significant impact on disease dissemination. SARS-CoV-2 RNA in samples taken has been shown to be positive in a few investigations(Xu *et al*., 2021).

Blood - borne communication (through contaminated blood or needle-sticks) would seem to really be unusual; breathing viruses are infrequently transferred through blood, and transfusion-transmitted disease with SARS-CoV-2 or else the associated Middle East breathing syndrume coronaviruss (MERS--CoV) otherwise SARS--CoV has still not been publicized(Zhou *et al*., 2020).

2.2.7. Clinical Manifestations:

Infections that cause no symptoms have been thoroughly reported. According to one study, SARS-CoV-2 infects just 33% of those who get sick (Chan *et al*., 2020 ; Oran & Topol 2021)

Approximately (19 %) of people during a COVID-19 outbreak on a cruise liner, in which nearly everyone passengers and crew

members have been examined for the severe acute respiratory syndrome coronavirus, 2% of those on panel screened positive for COVID-19 (SARS-CoV-2); 58 percent of the (712) revealed COVID-19 situations were symptom free at the initial diagnosis, approximately 77 to 89 percent of people who were hospitalized and followed remained asymptomatic over time in investigations of subgroups of those who were asymptomatic (Sakurai *et al*., 2020).

Only 22% of the 1271 patients were symptomatic 43 percent of those tested were symptom free just at period of testing, and 43 percent were asymptomatic during the follow-up time.. Pregnant women arriving for birth have also been documented to have high incidence of asymptomatic infection (Campbell *et al*., 2020).

For example, 50 percent of A chest computed tomography was performed on 24 individuals who were asymptomatic and had an infection at computed tomography (CT) displayed characteristic About 20% displayed typical imaging problems such as floor opacification or irregular shadows in a study of 24 patients with asymptomatic illness (Hu *et al*., 2020).

Five individuals had a low-grade fever a few days after being diagnosed, with or without other characteristic symptoms. Another research found that 67 percent of patients with asymptomatic illness diagnosed by contact tracing showed only two patients had hypoxia, and they all recovered after being admitted to the hospital (Wang *et al*., 2020).

Roughly patients also are untreated at the period of judgement acquire indications afterwards (eg, they genuinely asymptomatic at the initial diagnosis PR symptomatic). According to only one study, symptoms began to show four days after the first positive RT-PCR result (Sakurai *et al*., 2020).

2.2.7.1. Period of incubation:

The COVID-19 has a 14-day incubation period, the highest incidence emerge 4 to 5 days of exposure, with the lot of instances presenting 4 to 5 days later. In a research of 1099 people had confirmed COVID-19 symptoms, the average incubation time was 4 days (inter - quartile ranged 2 to 7 days)(Guan *et al*., 2020).

However, incubation period estimates can be inaccurate and vary depending on the technique of detecting exposure and the specific calculations performed. Another study included data from 1084 client who toured or else lived in Wuhhan and were later diagnosed with COVID-19 after leaving the city. The study found a prolonged average development time of (7-8) days, with 5 to 10% of individuals showing symptoms 14 days otherwise additional afterward experience (Qin *et al*.,2020).

2.2.7.2. The First Presentation:

Coughing, muscle aches, and headaches are most typical problems in patients with symptomatic COVID-19 with in number of situations. Heat, coughing, breathlessness, and symmetrical penetrate on chest tomography are most typical problems of pneumonia. Body temperature, sneezing, breathlessness, and bilaterally penetrates on lung tomography are most typical problems of pneumonia. Diarrhea, a throat infection, and a foul smell or tasting are a few of the indications and indications (Guan *et al*., 2020).

Despite the fact that COVID-19 is more prevalent than have been no unique indications or signs that can distinguish COVID-19 from those other viral respiratory illnesses in regards of some clinical aspects (such as smell or tasting abnormalities) (Struyf *et al*.,2021).

It's conceivable that the patient has COVID-19 if the early symptoms are followed by a week of dyspnea. A assessment of 370,000

verified COVID-19 cases in the US with documented symptoms submitted to the CDC indicated a broad spectrum of symptoms (Stokes *et al*.,2020).

Cough affects 50% of the population, while fever (either subjective or measuring a temperature more than 100.4°F/38°C) affects another 43%, myalgia affects 36%, and headache affects 34% of the population. Thirty-nine percent of patients complained of dyspnea, while twenty percent had sore throats, 19 percent had diarrhea, and 12 percent had nausea/vomiting. A loss of smell or taste, stomach discomfort, or rhinorrhea, which is the most prevalent symptom, affects only around 10% of the population. Other cohort studies of individuals who had identified by COVID-19 have shown comparable clinical results (Wang *et al*.,2020).

Fever is seldom prevalent at the time of presentation, even in hospitalized patients. In one research, almost all patients developed a fever, however 20% have a very low temperature (under 100.4°F/38°C) that could not be detected (Huang *et al*., 2020).

According to a research of over 5000 patients, only 31% of COVID-19 clients hospitalized in New York City had a temperature higher of 100.4°F/38.6°C when they arrived (Richardson 2020).

In the past, there were more complaints of problems with Oder and tasting(for example lack of sleeping and difficult of swallowing). The occurrence estimations for odor and tasting anomalies were 52 percent and 44 %, correspondingly, in a meta-analysis of observational studies (although rates varied from 5 percent to 98 percent) (Tong *et al*., 2020).

In a 4 weeks follow-up study in Italian, 90 per cent of COVID-19 patients who had odor or tasting alterations indicated cure or improvements, suggesting that the majority of COVID-19-related

subjective smell and taste abnormalities are not permanent (Boscolo-Rizzo *et al*.,2020).

Intestinal indications (such as sickness and looseness of the bowels) may be the initial point of contact for some patients, despite the fact that they are seldom reported. In a review of research on digestive symptoms in people with proven COVID-19, diarrhea, upset stomach, and stomach cramps were recorded in 13, 10, & 9percent of patients with a diagnosis COVID-19, respectfully (Cheung *et al*., 2020).

According to, conjunctivitis is a condition that affects the eyes. Nonspecific signs and symptoms have been reported in older persons, particularly those above the age of 80 and those with underlying neurocognitive deficits, such as falls, general health deterioration, and delirium (Colavita *et al*., 2020; Annweiler *et al*., 2021).

The dermatologic features in COVID-19 individuals are not well understood. Maculopapular, urticarial, and vesicular eruptions, as well as transitory livedo reticularis, have been reported. Reddish-purple nodules on the distal fingers, resembling pernio(chilblains), had been seen in kids and early adult through verified or supposed COVID-19, while no link had shown (Recalcati, 2020).

2.2.8. Diagnostic Tests:

On the basis of symptoms, COVID-19 can be tentatively diagnosed and verified contaminated discharges using reverse transcription reaction (RT-PCR) or even other nucleotides investigations Thoracic CT scans, in addition to microscopic examination, can help diagnose COVID-19 in those who have a significant clinical indication of infection. Serological tests that identify in reaction to infection, the body produces antibodies can be used to determine whether or not an infection has occurred previously (Zhao *et al*., 2020).

2.2.8.1.Nucleic Acid Detection Technology:

Individuals must maintain a variety of samples for laboratory diagnosis, including nose wipes, tracheal or nasal passages extraction, mucus, soft tissue, blood, and faeces. The finest specimens are those from the lower airways. The SARS-CoV-2 is diagnosed using real-time qualitative polymerase chain reaction (RT-qPCR) & elevated sequencing technologies. One of most exact approaches include high-throughput sequencing and virus serology, but their usage is restricted due to high cost and instrument reliance. In contrast, RT-qPCR is a simple and effective method for identifying virus nucleotides in pulmonary samples and serum. Following the SARS-CoV-2 epidemic in China, Chinese companies began offering RTq PCR test kits that had been approved by China's Centers of Disease Control & Prevention (China CDC) (Wang *et al*., 2020).

Diagnosis kits are also available for rapid COVID-19 diagnosis that target antibodies or antigens such as ELISA and POCTof IgM/IgG kits have been developed and have higher detection rate. Furthermore, a reduction or normalization of leukocytes, as well as an elevation or normalization of monocytes or a reduction in lymphocytes, might suggest SARS-CoV-2 infection (Wang *et al*., 2020).

2.2.8.2. Imaging:

2.2.8.2.1. Chest radiographs:

In situations of initial or moderate illness, upper body radiography could be clear. In Hong Kong, a retrospective analysis of 64 COVID-19 individuals was conducted. found that 20% of them had no at any time throughout their illness, abnormalities on chest radiography (Wong *et al*., 2020).

Abnormal radiological findings included Inside the lateral, periphery, and lower chest zones, there was condensation and surface

opacities; pulmonary participation developed with time, peaking 10 to 12 days following symptom start also described a spontaneous pneumothorax. In a retrospective assessment of nearly 70,000 COVID-19 patients assessed in emergency departments across Spain, 40 patients (0.56 percent) had spontaneous pneumothorax (Miró *et al*., 2021).

2.2.8.2.2. CT Imaging Examination:

Despite the fact that lung computed tomography (CT) seems being more specific then radiography, and some thoracic CT readings could be COVID-19-specificied, no single discovery could completely rule COVID-19 in or out. The American College of Radiography (ACR), a medical institution based in the United States, advises against the use of lung CT for COVID-19 testing or diagnostic. instead saving it for hospitalized patients who need it for treatment (ACR. 2020)

The Radiological Society of North America provides guidelines if a CT scan is performed classified characteristics for COVID-19 as typical, indeterminate, or unusual, and has recommended linguistic for the explanation reports. The far more general finding on chest CT in COVID-19 sick people is floor opacification even without comprehensive and multidimensional anomalies, which is constant to viral pneumonia. The relevant anomalies were detected in a comprehensive assessment of study examines the chest CT information including over 2700 persons with COVID-19, for examples (Zhao *et al*., 2020).

Bronchitis, pulmonary effusion, pericarditis, lymphadenitis, and a bizarre pavement patterns are among less usual observations (ground-glass opacifications with superimposed septal thickness). The COVID-19 chest CT abnormalities mainly impact the lower lobes, are bilateral, and have a peripheral distribution. These findings are characteristic of COVID-19, nevertheless they are not unique to it, and they are seen often in other viral pneumonias (Altmayer *et al*., 2020).

A "positive chest CT for COVID-19 (as determined by a consensus of two radiologists) showed a sensitivity of 97 percent when using the PCR tests as a reference in a study of 1014 patients in Wuhan who underwent both RT-PCR testing and chest CT for COVID-19 evaluation. On the other hand, specificity was only about a fourth of what it should have been" (Ai *et al*., 2020).

Conducying CT scans of Chest of (219) COVID-19-infected patients in China were compared to those of 205 patients in the United States with other types of viral pneumonia. The study found that patients in China had significantly more opacities (91%) than those in the United States (68%) did. They also found significantly more fine reticular opacities (56%) than those in the United States (22%). Chest CT scans, like chest radiographs, might show no abnormalities at the start of symptoms before worsening over time (Bao *et al*., 2020; Bernheim *et al*., 2020).

As a result, abnormalities on a chest CT scan have been observed in people prior to their symptoms and even before viral RNA has been confirmed in upper respiratory collections. A patient's radiographic abnormalities may not clear up until their fever and hypoxic symptoms have subsided (Xie *et al*., 2020; Han *et al*., 2020).

2.2.8.2.3. Lung Ultrasound:

Point-of-care When alternative imaging tools are not readily accessible, lung ultrasonography has been reported for evaluating. The pleural line thickening, discontinuance, and stoppage in persons with probable COVID-19 lung involvement; On lung ultrasonography, persons with COVID-19 have typically noticed B lines beneath the pleura that seem solitary, multicenter, or lobed; dispersed, strip, or nodular restructurings; and oxygen bronchogram indications in the restructurings (Peng *et al*., 2020).

Although ultrasound appears to be a sensitive tool for detecting COVID-19, several investigations have found that it has a limited specificity. The pooled sensitivity and specificity in a systematic evaluation of five investigations were 86 and 55 percent, respectively (Islam *et al*. 2021).

2.2.9. Complications:

Symptoms may begin to appear within a week for some individuals, even if they first seem minor. There was an increase in dyspnea and an increase in hospitalization among the 138 patients in Wuhan who had pneumonia coronavirus-2 reasons "severe acute respiratory symptoms (SARS-CoV-2)". Regarding another research, the median time from the development of dyspnea and its resolution was eight days (Cohen *et al*., 2020).

COVID-19 has been associated to a variety of issues, such as the following:

2.2.9.1. Respiratory Failure:

The most common consequence in individuals with severe illness is "acute respiratory distress syndrome (ARDS)", which can develop quickly after the beginning of gasp. ARDS occurred in 20% of the 138 patients in the study Mechanical ventilation was employed in 12.3% of the cases, on average, eight days next the beginning of warning sign. Artificial breathing was required by 12 to 24 % of hospitalized in extensive trials conducted in the USA (Wang *et al*., 2020; Petrilli *et al*., 2020).

2.2.9.2. Cardiac and Cardiovascular Problems:

As previously mentioned, palpitations, myocardium injury, As a result, cardiac arrest and shocks have been mentioned(Cao *et al*., 2020).

2.2.9.3.Thromboembolic Consequences:

In COVID-19 patients who are severely sick, VTE, including encompasses extensive pulmonary embolism and deep venous thrombosis(PE), is frequent in the intensive care (ICU), with documented rates between 10percent up 40. Acute stroke and leg ischemic were also reported as a result of thromboembolic events in the arteries in people younger than 50 years old who have no risk factors (Bilaloglu *et al*., 2020; Mao *et al*., 2020).

2.2.9.4. Neurologic Complications:

The COVID-19 encephalopathy is a frequent side effect, particularly in severely ill individuals; for example, one-third of a sample of hospitalized patients had encephalopathy. Strokes, aberrant movement, motor-powered and sensory shortages, ataxy, and convulsion are all fewer prevalent than they formerly were (Liotta *et al*.,2020).

2.2.9.5. Inflammatory complications:

Some people have extended fevers, higher inflammation indicators(e.g., D--dimer, ferritinn), and enhanced proinflammatory cytokiness when they have a fever, individuals with Exuberant inflammatory responses have been associated to serious and deadly illnesses in client with severely COVID-19 (Mehta *et al*., 2020).

Contrary to popular belief, cytokine release syndrome is not the cause of these symptoms (e.g., in response to T cell immunotherapy),COVID-19 has far lower amounts of proinflammatory cytokines than cytokine release syndrome and sepsis (Restivo *et al*., 2020).

Clinical similarities between Kids with COVID-19 have indeed been reported to develop Kawasaki illness and sepsis. who have a multisystem inflammatory syndrome. The few people who have been identified with this syndrome have significantly elevated inflammatory

markers and multiorgan failure (especially cardiac dysfunction), although the lungs have only been involved in a limited way (Morris *et al*., 2020).

2.2.9.6. Secondarily Contaminations:

In most cases, Secondary infections are not really an issue, despite the fact that they are a common adverse effect of COVID-19. The occurrence of bacteria coinfections was 8percentage points (in 62 of 806) in a study of nine trials, with respiratory tract infections and septicemia being the most prevalent (Rawson *et al*., 2020).

Although the prevalence of this complication is unknown, some publications have documented probable COVID-19 causes invasive aspergillosis in immune-competent people with ARDS (Koehler *et al*., 2020).

A systematic appraisal of 108 COVID-19 patients was conducted in Italy on mechanical ventilation, Increased blood or BAL glycosaminoglycan levels, development of Fungus on BAL culture, or a squamous cell infiltration without reason were used to diagnosis suspected aspergillosis in 30 (28%) of them (Bartoletti *et al*., 2020).

In India, mucormycosis has been documented in patients by serious and recent COVID-19; the prevalence is unknown, but some sources claim that almost 15,000 cases occurred by the end of May 2021 (Raut & Huy 2021).

A retrospective study from 16 healthcare centres in India found 187 situations of mucormycosis by many approximately 12,000 admitted patients with COVID-19 between September and December 2020 (The bulk of instances impacted the implement appropriate area (incidence 0.27 % generally and 1.6 percent amongst Mechanically ventilated patients)(Patel *et al*., 2021).

Diabetes mellitus and glucocorticoid use were frequent risk variables in our investigation and published case reports. In addition

RNA and antigen from SARS-CoV-2 have been found in various organs during autopsy studies besides the respiratory tract. This suggests that the virus has spread throughout the body in some cases. It is unknown whether viral cytopathic effects at these other locations have contributed to the observed complications in these patients' deaths (Sen *et al*., 2021; Puelles *et al*., 2020).

2.2.9.7. Long-Term Impacts and Healing:

The length of period it takings to improve from COVID-19 was influenced by a number of variables, including oldness, before -existing diseases, and harshness of illness. Those who are suffering from a slight illness are anticipated to recover swiftly (e.g., within two weeks). Many people who are suffering from a more severe sickness, on the other hand, may need more time to recuperate (eg, 2 to 3 calendar month). Exhaustion, gasp, upper body discomfort, coughing, and intellectual impairments were the maximum predominant long-term indications. There is additional evidence that long-term respiratory and cardiac issues may be a possibility (Puntmann *et al*., 2020).

2.2.10.Treatment:.

2.2.10.1. Pharmacologic Therapies In The Treating Of COVID-19 In Adults:

Antiviral drugs (e.g. remdesivir) and antibody - based (e.g. bamlanivimaab/ ettesevimab, casirivimaib/ imdevimiab), anti-inflammatory pharmaceuticals (e.g. dexamethasone), and immune suppressants agents (e.g. baricitinieb, tocilizumiab) are as of now prohibited underneath the FDA's (Coopersmith *et al*., 2021).

2.2.10.1.1. Antiviral Therapies:

- **Remdesivir:**

Remdesivir was shown to be efficacious in vitro against SARS-CoV-2, a broad-spectrum antiviral medication. The FDA accepted

remidesivir intended for experimental use in adulty and child patients (above the age of 12 and weighting at minimum 40 kg or extra) after three randomized controlled clinical trials showed it was more effective than a placebo at speeding up healing in grownups patient with moderate -to- severely COVID-19 (Wang *et al*., 2020; Goldman *et al*., 2020).

In a trial, which comprised 11,330 patients COVID--19 patients were randomly assigned to get remidesivir 2750 either no treatment 4088 at 405 hospitals in 40 countries, inpatients were randomly allocated to receive remdesivir 2750 or no medication (Zhang & Mylonakis 2021).

- **Chloroquine and hydroxychloroquine:**

During the pandemic, they were recommended as antiviral therapies for COVID-19. However, In hospitalized patients, randomized-control studies assessing the usage of hydroxychloroquine withing or without azithromycin revealed no difference in overall survival or clinical state (Horby *et al*., 2020).

- **Lopinavir/ritonavir:**

During the early stages of the pandemic, an FDA-approved combination medicine for HIV treatment was offered as an antiviral therapy against COVID-19. The results of a randomized control trial comparing lopinavir-ritonavir medication to typical of caring in individuals with severely COVID-19 were inconclusive. The treatment of COVID-19 with Lopinavir/Ritonavir is currently not allowed whether the patient is in or out of the hospital. and more colleagues of Cao (Cao *et al*., 2020).

- **Ivermectin:**

An U.s. food and drug administration accepted anti-parasitic medication utilized globally to cure COVID-19 is backed up by an in

vitro research that revealed SARS-CoV-2 proliferation was reduced. A only one randomised controlled research involving 476 adults with moderate COVID-19 disease found that when they were randomly allocated to take iverimectin (300 mcg/kg) weight for 5 days or placebo, they did not experience substantial improvement or eradication of symptoms. In hospital or non-hospitalized patients, ivermectin is currently not advised for COVID-19 treatment (Caly *et al*., 2020; López-Medina *et al*., 2021).

2.2.10.1.2. Neutralizing Antibodies Against SARS-CoV-2:

- **Plasma from Recovering Patients:**

It was employed in the SARS, MERS, and Ebola epidemics, although there were no randomized control trials to back up its efficacy. The use of convalescing plasma treatment for those with severe COVID-19 has been approved by the FDA (Joyner *et al*., 2021).

Regardless of the fact that it seemed promising, many studies evaluating the use of postmortem plasma in life-threatening COVID-19 have yielded mixed outcomes. Clients admitted to hospital with COVID-19 who obtained a transplant of convalescent plasma with greater anti-SARS-CoV-2 IgG antibody stages had a lower risk of dying than patients receiving a transplant of convalescent plasma with reduced antibody levels, as per to one retrospective analysis based on a US central registry. In 3 small randomized control trials, patients receiving with convalescent plasma vs. standard care showed non - significant different clinical benefit or total mortality (Simonovich *et al*., 2021).

In vitro testing of convalescent plasma of persons infected only with initial SARS-CoV-2 strains indicated much reduced neutralization of the SARS-CoV-2 variation B.1.351/ 501Y.V2 variant. The B.1.351 virus was found to be much more susceptible to neutralizing by convalescent plasma obtained from people who have actually been

contaminated with the original SARS-CoV-2 variants than the B.1.1.7 variation, however this wasn't the case with the B.1.1.7 variation (Wibmer *et al*., 2021; Wang *et al*., 2021).

2.2.10.1.3. Immunomodulatory Agents:

- **Corticosteroids:**

Lung damage caused by inflammation is connected to a condition known as severe COVID-19, which is characterized by cytokine production and an increase in inflammatory markers. COVID-19 individuals who were managed with glucocorticoids survived well, albeit this was not extensively documented at the start of the epidemic. As per the SARS-CoV-2 virus was clinical indicated or diagnosed in hospital admissions in the Recovering trial, dexamethasone decreased 4-week death in patients on intensive ventilators or oxygenation assistance, although not in those who aren't really getting any ventilatory support (Horby *et al*., 2020).

- **Interferon-1a (IFN-1a) is a kind of interferon:**

It was supposed that SARS-CoV-2 reduces production of interferons, a kind of cytokine essential for mounting an effective immune response to viral infection. Before now, IFN-1a has not been shown to be helpful in the treating of acute-respiration-distressing-syndrome-(ARDS). Researchers showed that inhaled IFN-1a had a better likelihood of improving clinical outcomes than a placebo in a small, double-blind, randomized study (Yuen *et al*., 2020; Monk *et al*., 2021).

The patient ’s response to inhalation IFN-1a was not substantially significantly varied group in another small randomized clinical study. The drug lowered the duration of stay and the 28-day death rate when administered initially in the hospitalized procedure, according to the researchers. It is, however, difficult to evaluate the

results since four of the patients in the treatment group died before they completed their treatment (Davoudi-Monfared *et al*., 2020).

• Antibodies against interleukin-1 (IL-1):

Rheumatoid arthritis patients may now use Anakinra, an FDA-approved interleukin-1 receptor antagonist. On the basis of the notion that cytokine production, particularly interleukin (I.L.)-1, is driving severe COVID-19, a small case-control study experiment examined Its usage in severe COVID-19 is off-label. Anakinra decreased the requirement for In this study, intrusive ventilation was linked to mortality in individuals with symptomatic COVID-19, which included 52 patients who were given anakinra and 44 patients who were given conventional therapy (Huet *et al*., 2020).

2.2.10.2. Oxygenation and Ventilation Management COVID-19:

2.2.10.2.1. Conventional Oxygen Therapy:

In individuals with respiratory insufficiency, continuous pulse oximetry should be employed. To preserve an oxygenation (SpO2) of 92 to 96 percent, supplemental oxygen should be administered by a nasal cannula or Venturi mask 88-90 percent if you have Chronic obstructive pulmonary disease (COPD). If the patient's condition and oxygen saturation improve, the extra oxygen should be given for the foreseeable future with only sporadic monitoring. No improvement in symptoms or deterioration of oxygen saturation necessitates the use of Interventions like High-Flow Nasal Cannula (HFNC) or Noninvassion Positive Pressure Ventilation (NIPPV) were noninvasion (Cascella *et al*., 2021).

2.2.10.2.2. Management of COVID-19 Acute Hypoxemic Respiratory Failure:

The greatest prevalent consequence in adulty person with COVID-19 is acute hypoxemic pulmonary distress, and routine oxygen

treatment fails to provide the oxygen demand in these individuals. People who use a high-flow intra nose cannulation (HFNC), endotracheal intubation (ETI), or noninvasivassion positively pressure ventilation (NIPPV),or endocorporeal membrane oxygenation (ECMO) should all be treated with these methods (Cascella *et al*., 2021).

2.2.10.2.3. Noninvasion Positively Pressure Ventilator using a Highly-Flowing Nasal Cannulation (HFNC) (NIPPV):

It is possible to manage COVID-19-relattion to critical hypoxemic respirational failing using noninvasive, enhanced respirational care modalities including HFNC also NIPPV, which may assist patients avoid the need for invasive mechanical ventilation. When used prior to mechanical ventilation, HFNC may recover the prediction of patients more than traditional oxygen treatment or NIPPV, according to a meta-analysis of data comparing the three treatments (Ni *et al*., 2018).

Exhaled air dispersion is minimized when HFNC or NIPPV are used, particularly when the interface is properly fitted. This minimizes the possibility of transmission of nosocomial infections. Negative pressure chambers should only be used for these therapies since they provide a greater danger of aerosolization (Grieco *et al*., 2021).

The patients withing COVID-19-relatated to acute hypoxemic respirational failure, noninvasive Positive-pressure Ventilation (NIPPV), or BiPAP and CPAP, may be useful in avoiding invasive mechanical ventilation in the right individuals. As opposed to the use of ARDS, individuals admitted to the COVID-19 should be treated with NIPPV when they develop respiratory insufficiency as a result of COPD, cardiac-related lung disease, or OSA (Berlin *et al*., 2020).

A helmet is advised to decrease the possibility of aerosolization. It is recommended that patients with NIPPV use masks that include an antibacterial filter built into the expiratory valve (full-face or oronasal). Hospitalized patients had COVID-19 with reasonable to high hypoxemia were not significantly different in the number of days without respiratory support when In comparison to high flowing nasal oxygenation, a helmet noninvassion ventilater therapy was adopted, according to the consequences of an opening-labels multicenter randomizing clinically experimental in Italy (Cascella *et al*., 2021).

2.2.10.2.4. Invasive mechanical ventilation with Endotracheal Intubation and Lung Protection:

As soon as possible, endotracheal intubation should be administered to optimize first-pass success in the event of an impending respiratory collapse. Physicians and other health professionals must wear appropriate personal protective equipment (PPE) including such gowns, gloves, Masks , and safety glasses when performing techniques like tracheostomy and routine ventilation previous to tracheostomy, physiological trimming of the client, and a wide range of critical patient care (Cook *et al*., 2020).

The Covid-19 Management Recommendations Panel of the National Institutes of Health doesn't really recommend inhaled respiratory vasodilators like nitric oxide. Respiratory ventilation might decrease the risk of developing or worsening acute kidney injury (AKI) by minimizing ventilator-induced circulatory consequences. If hypoxemia persists after lung-protective ventilation, or if prone ventilation fails to improve it, ECMO should be considered (Cascella *et al*., 2021).

2.2.11. Infection Control and Prevention:

On Dec. 31, Wuhan, China's Hubei Province, The frequency of acquired infections increased dramatically. It was there. The WHO considered a public health emergency in lately Jan 2020, which was later elevated to a pandemic (WHO). COVID-19 is caused by the coronavirus 2 (SARS-CoV-2). Standard Precautions are the minimal infection protection precautions that apply to all patient/client care in any location where healthcare is administered, regardless of the patient/suspected client's or proven infection status (CDC., 2020 b).

The COVID-19 is still a work in progress. The World Health Organizations(WHO) and the Center for Diseases Controlling and Preventions (CDC) in the U.S. government have released interim guidelines (CDC., 2019).

2.2.11.1. Infection Control in the Health Care Setting:

In individuals with potential or confirmed COVID-19, limiting SARS-CoV-2 spread is a critical part of treatment. In an early study of COVID-19 infection in 138 individuals from China, it was predicted that 43% of the patients got the virus in the hospital. In one lengthy treatment center in Washington State, insufficient infection control practices contributed to the expansion of illness to 81 residents, 34 team members, and 14 visitor (Wang *et al*., 2020; McMichael *et al*., 2020).

As an example, while some reports have found a higher proportion of instances of COVID-19 in health care personnel (HCWs)in patient-facing roles, others have found that infection rates among HCWs often appear to parallel those of the general population (Shah *et al*., 2020).

2.2.11.2. Personal Preventive Measures:

A common recommendation for residents is to preparation community distance when out in public, they should avoid big groups

and leave at least six feet (two meters) between themselves and others. if SARS-CoV-2 is widespread in the town (Honein *et al*., 2020).

It is also suggested that the following general measures be taken in order to restrict the spread of infection: Even after touching public surfaces you should wash your hands with caution and attention. When hands aren't noticeably dirty, a hand antiseptic by at minimum (60%) alcohol is a feasible substitute to soap. A study in which SARS-CoV-2 virus-infected mucus specimens were grown and applied to postmortem skins. showed the requirement of clean hands. About nine hours after being exposed to 80 percent alcohol, SARS-CoV-2 was completely wiped out from the skin (Hirose *et al*., 2020).

When we talk about respiratory hygiene, we're referring to how well one's lungs are maintained (e.g. cover the coughing otherwise sneezing). Avoiding the use of your hands in front of your lips (especially the eyes, nose, and mouth). People will avoid utilizing contact lenses, according to the American Academy of Ophthalmology. them more likely to touch their eyes (American Academy of Ophthalmology (AAO)., 2020).

Make certain that the ventilation in the inner rooms is adequate. Ventilation is achieved by open the spaces and accesses and introduction supporters in the lead of them, you may reduce the amount of heat that enters your home help push hot or cold air outside, running heaters and air conditioners on a continuous basis, and carrying about portable HEPA filters (Lindsley *et al*., 2021).

Every member of the community, particularly the elderly and anyone with pre-existing medical conditions, should take those actions if SARS-CoV-2 is distributed across area (McIntosh *et al*., 2021).

2.2.11.3. Wearing Masks in Public:

2.2.11.3.1. When Should you Use a Mask?

Local mask-wearing guidelines are influenced via a diversity of influences, counting the prevalence communicable diseases and vaccination rates. Mask use is advised by the WHO as portion of a comprehensive strategy to decrease spread of SARS-CoV-2 both inside and outdoors where widespread transmission is present and social distance is impossible, as well as indoors where inadequate ventilation is prevalent (regardless of the capacity to distance) (WHO., 2020 j).

According to the CDC, persons who aren't immune to the flu should wear masks while they are out in public or with strangers. At transit hubs and on public transportation (such as a plane, bus, ferry boat, railway station, or seaport), the CDC has also ordered the use of face masks for everyone (CDC., 2021 a)

2.2.11.3.2. Mask Types:

It is recommended that the general public in the United States use cloth or disposable (e.g. surgical) masks. To manufacture cloth masks, use many layers of tightly woven fabric. All masks should be able to cover the whole face without slipping off. An adjustable-nasal bridge mask, cloth-over-disposable mask, knotted ear loops on a disposable mask, masks with tie attachments in place of ear loops, and a mask brace are all methods for ensuring a better fit for masks (Clase *et al*., 2020; CDC., 2021b).

Exhalation valves should not be included in masks. When there is a greater chance of exposure, the necessity of fit and filtration rises, according to the CDC (eg, lengthy nearby connection within individuals outdoor the home). Commercially available respirators (such as N95 or KN95 respirators) are an alternative for certain people because to their excellent filtering effectiveness and simplicity of use when worn

correctly on the face. There are KN95 respirators on the market that do not fulfill the FDA's filtration criteria; if they are used, they should be KN95 respirators that have been certified for emergency use (FDA., 2021).

Most people should use non-medical masks, and the WHO had recognized recommendations at the best arrangement of a cotton mask in order to improve watery confrontation and separation efficiency. Whereas in the same room as people at danger for severely COVID-19 (e.g., those completed sixty years old or with risky basic conditions), any home memberships of those with assumed or established COVID-19 should wear medical masks (WHO., 2020 k; WHO., 2020 l).

Clients should be educated about the need of hand hygiene, while putting on or removing masks, as well as the necessity of washing fabric masks on a regular basis. Other preventative measures, such as social isolation and hand cleanliness, should be highlighted by physicians in addition to wearing a mask. It is important to inform the public that masks have not been found to limit gas exchange in patients with underlying lung illness (Samannan *et al*., 2021).

2.2.11.4. Distancing Socially and Physically:

To avoid the transfer of the SARS-CoVi-2 virus in community, people were advised not to engage in any social or physical contact with anybody outside of their immediate family (including across the United States). It's not clear what's the appropriate distance; the CDC suggests six feet (two meters) in the United States, although the WHO recommends three feet (one meter) (one meter). The SARS-CoV-2 exposure may be prevented by avoiding close The greatest major risk factor for infection is coming into touch with an infected person. When persons are physically isolated from one another, SARS-CoV-2 transmission is more probable (Tsai *et al*., 2021).

When persons were in close proximity, infection rates for SARS-CoVi-2, SARS-CoVi, and Middle East's respirational syndrome coronavirus (MERS-CoVi) were greater than when they were separated by more than one meter. In a meta-analysis of observational research, this was shown (12.8 versus 2.6 percent). Transmission was greatly reduced when the distance was more than six feet (two meters) (Chu *et al*., 2020).

2.2.11.5. In High Risk Situations Screening Recommended:

In long-term care institutions, Infection screening for SARS-CoV-2 checking for viruses on a regular basis may help prevent epidemics by quickly identifying instances and separating those who are sick from those who are not (CDC 2020 c).

Similar strategies have been employed in other places where people gather, such as college campuses. In an effort to decrease community transmission, some have advocated using serial testing more often (Denny *et al*., 2020).

Serial screening has been done using a mix of NAATs and antigen testing. However, modeling studies have shown that if testing is done often enough, even tests with lesser sensitivity may successfully reduce cumulative infection rates. NAAT tests are more sensitive than antigen assays. A screening test must also be conveniently accessible and have a quick turnaround time (Larremore *et al*., 2021).

Testing-based screening programs offer the benefit of detecting illnesses at an early stage, even when no symptoms are present. Due to the substantial number of asymptomatic persons, numerous research had emphasized the shortcomings of symptoms- created testing approaches (Ng *et al*., 2021).

2.2.11.6. Other Public Health Interventions:

On Jan 30, 2020, The WHO declared a worldwide medical crisis, and the COVID-19 epidemic was categorized as a pandemic by the WHO in March 2020, emphasizing the gravity of the condition and encouraging all governments to act in identifying illness and trying to prevent the transmission of infection. Nonpharmaceutical therapies had been used to control the spread of illness in nations all over the globe. Distancing orders, staying-in-home, and the finishing of schools, events, non-essential businesses are just a few of the strategies being utilized to stop the virus from spreading (e.g., masks, hand hygiene, respiratory etiquette, and environmental cleaning). Travel limitations, including departure and/or entry screening, public gathering restrictions, active case detection and isolation, interaction outlining, and isolation are all options (unravelling persons who had been uncovered from another) Epidemiological research indicated fewer cases of SARS-CoV-2 contamination besides COVID-19-relattion death when these methods were introduced (Flaxman and Marriott 2020 ; Marriott *et al*., 2021).

The WHO has issued interim guidance on implementation to assist countries where incidence is decreasing and transmission reduction measures are being relaxed. The interim guidance emphasizes protecting the most vulnerable populations while also recommending a step-by-step approach tailored to local conditions. The WHO also advises that personal precautions be maintained, as well as public health initiatives to discover instances for isolation and contagion identification (WHO., 2020 m)

Travel information is available from the Center for CDC for both domestic and international locations. Individuals should seek out nation and state-specific information before to travel since the risk of travel may vary fast, and the recommendations for reducing activities and testing after a trip differ by state (CDC., 2020 c).

2.2.11.7. Post Exposure Management:

2.2.11.7.1. Quarantine and Testing

Testing and quarantine are two methods for swiftly identifying secondary infections in an exposed person and preventing them from infecting others before they are detected. Following a community exposure, testing and quarantine are based on vaccination status and a history of illness in the United States. Those who have had closing interaction through someone who has a possible SARS-CoV-2 infection should follow these rules within forty eight hours of the beginning of manifestations, regardless of whether or not the other persons involved were wearing masks (CDC., 2021 c).

2.2.11.7.1.1. For Unvaccinated People:

Observe daily for fever, cough, and dyspnea for 14 days. Staying at home and keeping a safe distance from other people, particularly family members, is the best course of action for individuals who exhibit these indications or symptoms. In addition, they need to let their medical professionals know. fourteen days following the last exposure to SARS-CoV-2, the best quarantine time is recommended (as long as the individual is asymptomatic). The CDC, on the other hand, says that shorter quarantine durations may save the community money and resolve adherence concerns in change for a to some extent higher danger of after-quarantine spread (CDC., 2021 d).

Therefore, the following are acceptable alternatives: Quarantine is waived for seven days for those who are symptom-free and have an antigens SARS-CoV-2 examination result in forty eight hours of isolation's scheduled conclusion. Quarantine for ten days, as long as the patient remains symptom-free throughout that period. The quarantine period begins after the individual with COVID-19 isolation time for family members who cannot physically remove themselves from that person is

completed (e.g., preserve physically detachment, sleeping in an isolated room, usage a isolated restroom). Testing is also advised to quickly detect new infections after close contact (preferably five to seven days following exposure). A negative test result acquired immediately after exposure cannot remain utilized to decrease the isolation dated to fewer than 7 Days (McIntosh *et al*., 2021).

2.2.11.7.1. 2. For Vaccinated Individuals:

The self-quarantine recommendations above do not apply to fully vaccinated individuals, but they should be 3–5 days after exposure, be tested, and dress a masks in community for fourteen days or else till the examination results come back negatively. If symptoms of COVID-19 occur within 14 days of exposure, they should seek medical assistance immediately (CDC., 2021 e).

2.2.11.7.1.3. Individuals That have Recently been Infected:

These self-quarantine and screening requirements do not apply to anyone who are contaminated with SARS-CoV-2 during the past three months(CDC., 2021 f).

2.2.11.8. Vaccines

Aside from community well-being and contamination controlling procedures, immunization used to preventing infection with the SARS-CoV-2 virus by communities all over the world is one of the most important stages in averting this worldwide pandemic. There has never been a period when clinical researchers from across the world have worked so hard to modification new vaccines in contrast to SARS-CoVi-2 at a breakneck speed. Vaccination stimulates the immune system, resulting in the production of anti-SARS-CoV-2 antibodies that destroy the viruses. As of June 22, 2021, around 22% of the worldwide people has received at minimum single vaccine dose (WHO., 2021).

2.2.11.8.1. Vaccine BNT162b2:

According to the results of an ongoing worldwide, placebo-controlled, spectator pivotal efficacy research, BNT162b2 (mRNA-based, BioNTech/Pfizer) provided 95 percent prevention from COVID-19 in people 16 years & above if given in second dose 3 weeks apart (Polack *et al*., 2020).

2.2.11.8.2. mRNA-1273 Vaccine:

It has been shown that peoples who take two doses of Moderna (mRNA-based) vaccine (mRNA-1273) 28 days apart had a 94.1 percent efficiency rate in protecting COVID-19 illness, with no protection issues other than transitory local and systemic responses (Polack *et al*., 2020).

2.2.11.8.3. Ad26.COV2.S Vaccination:

For adults randomizing to receive the Ad26.COV2.S vaccination in an international, randomizing, placebo-controlling, multi-centers phases 3 research, the vaccine was shown to be 73.1 percent effective in protecting against COVID-19 (Sadoff *et al*., 2021).

2.2.11.8.4. ChAdOx1 nCoV-19 Vaccine:

At least one standard dosage provided 70.4% protection against symptoms of COVID-19 and 64% protection against COVID-19 following an drug's safety profile and clinical effectiveness were found to be satisfactory after an interim review of a multicenter randomized control study. The ChAdOx1 nCoV-19 vaccine has received approval for urgent use as a COVID-19 preventive approach in a number of countries around the world. However, FDA or EUA approval for usage in the US is still a long way off (Voysey *et al*., 2021; Shinde *et al*., 2021).

In early 2021, new clinical problems were discovered in a number of people following vaccination with the ChAdOx1 nCoV-19 vaccine and the Ad26.COV2. S vaccine, which were linked to thrombosis in odd areas and thrombocytopenia. Heparin-induced

thrombocytopenia (HIT) has striking similarities to this uncommon clinical illness (Aleem & Nadeem 2021). The Table(2-1) show the vaccination platforms for CoVID-19 in clinical trials.

Table(2-1).Candidate Vaccination Platforms for COVID-19 in Clinical Trials.

Vaccine name	Vaccine platform	Developer	Clinical trial phase	Clinical trial registrations
BNT162b1/ BNT162b2	RNA-based vaccine	Pfizer-BioNTech, Fosun Pharma	Phases I–III in USA, Germany, and China	NCT04368728, NCT04380701, NCT04523571
mRNA-1273	RNA-based vaccine	Moderna, NIAID	Phases I–III in USA	NCT04470427, NCT04405076, NCT04283461
INO-4800	DNA plasmid vaccine	Inovio Pharmaceuticals, International Vaccine Institute	Phases I–III in USA	NCT04447781, NCT04336410
GX-19	DNA plasmid vaccine	Genexine Consortium	Phases I and II in South Korea	NCT04445389
ChAdOx1 nCov-19 (AZD1222)	Adenovirus vector, non-replicating	University of Oxford, AstraZeneca	Phases I–III in UK, South Africa, USA and Brazil	NCT04324606, ISRCTN89951424, EudraCT2020-001228-32, PACTR202006922165132, EudraCT2020-001072-15
Ad26.CoV2-S	Adenovirus vector, non-replicating	Johnson & Johnson	Phases I–III in USA and Belgium	NCT04436276 NCT04505722 NCT04535453 NCT04509947
Ad5-nCoV	Adenovirus vector, non-replicating	CanSino Biologics Inc., Beijing Institute of Biotechnology	Phases I and II; phase II studies in China and Canada	ChiCTR2000031781, ChiCTR2000030906, NCT04341389 NCT04313127
Gam-COVID-Vac	Adenovirus vector, non-replicating	Health Ministry of the Russian Federation	Phases I–III in Russia	NCT04530396 NCT04436471 NCT04437875
PiCoVacc	Inactivated SARS-CoV-2	Sinovac Biotech	Phases I–III; phase III in China and Brazil	NCT04456595, NCT04383574, NCT04352608
COVID-19 vaccine	Inactivated SARS-CoV-2	Sinopharm, Wuhan Institute of Biological Products Co. Ltd	Phases I–III in China	ChiCTR2000034780, ChiCTR2000031809
BBIBP-CorV	Inactivated SARS-CoV-2	Sinopharm, Beijing Institute of Biological Products Co. Ltd	Phases I–III in China and United Arab Emirates	ChiCTR2000034780, ChiCTR2000032459
SCB-2019	Protein subunit	Clover Pharmaceuticals, GlaxoSmithKline, Dynavax	Phase I in Australia	NCT04405908
NVX-CoV2373	Protein subunit	Novavax	Phases I–III in Australia, USA and UK	NCT04368988 NCT04583995 NCT04533399

(Wang *et al.*, 2021).

2.2.12. Nurses' Knowledge regarding COVID-19:

The health education, screening, and help for the general population and those at high risk are the emphasis of the first area. Handwashing should be a regular part of health education, as should avoiding eye, nose, and mouth contact and canceling group events and shared meals to prevent illness (respiratory symptoms, cough, fever, and muscle soreness). People who have been confined because of COVID-19 need emotional support more than physical screening procedures can provide (Patel and Jernigan, 2020; Jernigan *et al*, 2020).

The responsibility of the nurse to screen for possible cases, apply standard measures, and educate and teach both patients and their families and healthcare workers in order to avoid nosocomial infections. Aside from providing medical treatment, nurses also monitor, provide supplies, take temperatures, assess respiratory symptoms, and offer emotional support to people confined to their homes due to mandatory quarantine restrictions (Jernigan *et al*., 2020; Patel& Jernigan 2020).

Nursing homes and long-term care facilities must implement proper preparations and safeguards. There is a risky of severe pneumonia or fatality of COVID-19-infected individuals in enduring care services and nursing homes. This is why it is so important for nurses to create safe and secure care and settings at these places during this epidemic. Resident care plans should contain techniques to swiftly detect and manage unwell residents, implement safe visiting regulations that restrict the number of visitors, keep the facility in a safe atmosphere and undertake crucial training and educational activities for healthcare professionals (CDC, 2020g).

Chronic obstructive pulmonary disease, chronic diseases, and cancer patients are protected because of their weakened immune systems. Patients infected with COVID-19 have much more serious health consequences than those in the general population. It is imperative

that cancer patients, especially those with hematological malignancies, who are presently undergoing chemotherapy and immunosuppressive therapies or bone marrow transplants, be well-informed and cared for in order to prevent the spread of infections. Self-defense techniques may be taught to patients by nurses (CDC, 2020g).

The COVID-19 patients in a critical or life-threatening situation are being cared for. Individuals of all age range, especially the elder persons and individuals with compromised immune systems, are at risk of acute pneumonia and even death as a result of COVID-19. Infected and symptomatic patients, particularly those with serious diseases, need rapid, intensive therapy. Consequently It is vital that healthcare workers be adequately protected by suitable personal protective equipment in order to minimize infection. It is vital to have enough ICU personnel and equipment. Patients recuperating from COVID-19-induced pneumonia are given immediate life-sustaining therapy by critical care nursing personnel, as well as psychological support by these team members (Lai *et al*., 2020; Liew *et al*, 2020).

Inadequate information and wrong attitudes among HCWs can have a direct impact on behaviors, resulting in delayed diagnosis, poor infection control, and disease transmission (Omrani & Shalhoub 2015).

2.2.13. Nurses' attitudes regarding COVID-19:

The HCWs are fighting the COVID-19 epidemic on front lines., and they are vulnerable to not just COVID-19 infection owing to their frequent contact with infected persons, but also psychological anguish, long work hours, exhaustion, occupational stigma, and physical aggression (Hoe& Wah 2020).

The COVID-19 was a recently discovered disease, and effective vaccines and therapeutics are actively being researched. Because of this, nurses are at risk of infection and work-related anxiety

and mental health difficulties while encountering this newly identified infectious condition (Khalid *et al*., 2019).

All healthcare systems throughout the globe rely on nurses to provide the most services to patients. During the outbreak, nurses from a variety of healthcare institutions fought COVID-19 on the front lines. As the first healthcare workers who interact with patients who show symptoms, nurses have an increased chance of contracting the illness (Al Thobaity & Alshammari 2020; Hartmann *et al*., 2020).

The COVID-19 has been detected in healthcare centers all around the world, and many healthcare personnel, including nurses, have tested positive (Magnavita *et al*., 2020; Erdem & Lucey 2021).

As a result, there have been several requests for nurses to be supported and protected against catching the disease (Al Thobaity& Alshammari 2020; Chirico *et al*., 2020).

Recent research examined healthcare personnel' understanding, attitudes, and usage of COVID-19 protective measures, including nurses, in various healthcare systems throughout the world (Tadesse., *et al*., 2020; Nuzzo *et al*., 2019).

During continuing COVID-19- epidemic, a recent research in Jordan found that medical practitioners' preventive conduct was not ideal. Another research found that Jordanian nurses saw their participation in the current epidemic as positive (Veronese *et al*.,2020; Ramadan *et al*., 2021).

2.2.14. Barriers to Infections Control regarding COVID-19:

If healthcare providers are treating COVID-19 patients, they must be knowledgeable of the risks of infectious disease, including the right usage of (PPE), good personal hygiene, and related environmental measures (Aldohyan *et al*., 2019).

Despite the increased burden caused by the continuing epidemic, The nurses were there to help and assist the patients care. It

has been suggested that having sufficient information combined with a positive attitude can contribute to the proper application of protective measures at work. As a result, the chance of developing the condition may be reduced (Haile *et al*., 2017).

The COVID-19 prevention efforts may be impacted by nurses' understanding and attitudes toward the illness. As a consequence, keeping tabs on nurses' understanding of and adherence to COVID-19 prevention strategies might be crucial. Further research on the influences on nurses' knowledge, attitudes, and usage of preventative actions related to COVID--19 may aid in development of new therapies to keep them safe from contracting the disease and others. The COVID-19 protection measures in the health care sector are little understood by nurses, and their attitudes, beliefs, and practices are unknown. The major objectives of this multi-center investigate was to study the current pandemic's of nurses' knowledge, attitudes, and usage COVID-19 prevention strategies. Additional goal was to find out what elements were linked to a high knowledge, a good mindset, as well as the proper use of preventive measures. In order to better safeguard healthcare workers, notably nurses, this research was conducted (McEachan *et al*., 2016).

Have low level of awareness of IPC rules, and also understanding of precautionary evidence during each and every day care delivery and the possible hazards of microbe transmitting to patient populations, all impede IPC adherence. Lack of awareness of the correctness, effectiveness, and the use of IPC mechanisms leads to poor adherence (Assefa *et al*., 2020).

Overcrowding, a lack of isolation facilities, and a dirty environment all contribute to disease transmission among HCWs, which is likely aided by HCWs' lack of education and awareness of infection control methods (Wu & McGoogan 2020).

Education and training are the supports of IPC practice development in order to overcome these hurdles. Knowledge is power, and HCWs should be conscious of this. After education and training, however, a lack of awareness of IPC procedures has been frequently demonstrated (Saqlain *et al*., 2020).

Washing hands, safety equipment (PPE), contagious disease vaccination, methods of spreading infection, patient infection evaluation, surgical equipment disinfection, healthcare waste disposal, and injection sticking and sharpness safety rules already are on HCWs' thoughts. More importantly, these IPC precautions, procedures, and strategies must be followed by HCWs (Haile *et al*., 2017).

2.2.15. Previous Studies:

First Study:

Sahar *et al*. 2020: an online, cross-sectional survey was conducted in Indonesia to assess "knowledge, attitude, and practices regarding COVID-19 and estimated barriers to disease transmission perceived by public health nurses (PHN). The COVID-19 was well-understood by the majority of participants, and the majority had a positive attitudes regarding COVID-19 and had excellent COVID-19 practices in their daily lives. Knowledge was shown to be associated with information sources. The researcher found a significant associations between attitude and sex, work involvement & information foundations. practices were shown to be related by sex and information source. There were important positively relationships between: knowledge & attitudes. Knowledge, attitudes, and habits among other things, are strongly linked to information sources. Knowledge, attitude, and practice were also shown to have positive linear connections. Patients who lied about their travel history and did not disclose it to the PHN were seen as significant barriers by the majority of the PHN.

Second Study:

Al-Ashwal *et al*., 2020: the cross-sectional study that included healthcare workers (HCWs) to evaluate the knowledge, preparedness, counselling practices of healthcare workers regarding COVID-19, and the perceived barriers to adequately prevent and control COVID-19 from major healthcare institutions in Yemen. A total of 1000 HCWs were invited to take part in the survey. The median scores for knowledge, self-preparedness, and counseling practice were 8 (out of 9) for knowledge, 9 (out of 15) for self-preparedness, and 25 (out of 30) for counselling practice, respectively. The intensive care unit (ICU) and emergency departments showed a statistically significant difference in which individuals from these departments were more prepared than the others (e.g. outpatients, pediatrics, and surgery). The lack of public understanding of COVID-19 preventative methods was recognized as the maximum prevalent barriers to active COVID-19 prevention and control in Yemen (89.1 %).

Third Study:

Saqlain *et al*. 2020: an online survey to assess knowledge, attitude and practice among healthcare workers (HCWs) in Pakistan regarding coronavirus disease 2019 (COVID-19) with A verified self-administered questionnaire. Findings showed that HCWs have good knowledge (93.2%), a positive attitude and good practice (88.7%) regarding COVID-19. HCWs perceived that limited infection control material (50.7%) and poor knowledge regarding transmission (40.6%) were the major barriers to infection control. Regression analysis indicated that pharmacists were more likely to demonstrate good practice than other HCWs. This study found that HCWs in Pakistan have good knowledge, but there are gaps in specific aspects of knowledge and practice that warrant attention.

Forth Study:

Saadeh et al. 2021: An online study was completed by 311 Lebanese nurses between March and April 2020. The study aimed to assess the knowledge, attitudes, and practices toward the coronavirus disease 2019 (COVID-19) among nurses in Lebanon. The finding of the study showed that Only 2% of nurses worked in a specialized COVID-19 ward and 20% have cared for a COVID-19 patient. The majority had sufficient knowledge of COVID-19; 62% declared being afraid of getting infected whereas 90% were afraid for their family members to get infected due to their occupational exposure. The majority of nurses (84.6%) declared following infection prevention and control precautions. Protective equipment were available in limited amounts in hospitals.

Fifth Study:

Shawahna (2021): a cross-sectional study that was conducted between October and Dec. 2020. he main aim of this multicenter study was to assess knowledge, attitude, and use of protective measures against COVID-19 among nurses across the Occupied Palestinian Territory (oPt) during the ongoing pandemic. The mean of knowledge, attitude, and use of protective measures scores were 75.7%, 75.1% and 91.6% respectively. High knowledge was predicted by being female and self-rating social status as high. Higher attitude was predicted by being female, self-rating academic achievements as high, and having contracted COVID-19, Higher use of protective measures was predicted by self-rating academic achievements as high. Findings of this study suggested that nurses in the oPt had high knowledge, relatively optimistic attitude, and appropriately used protective measures against COVID-19 during the ongoing pandemic. Knowledge, attitude, and use of protective measures among nurses should continuously be updated as information unfold during the ongoing pandemic.

Chapter Three

Methodology

Chapter Three

Methodology

This chapter provides description of steps that taken to conduct the present study. It contains research design, the administrative arrangement, settings of study, samples and data collection method, validity and study reliability and also planning for analysis of data .

3.1. Design of study:

A descriptive study (cross-sectional study) was carried out to "assess knowledge, attitudes and to identifying the perceived barriers to infection control regarding COVID-19 among nurses in Al-Hilla teaching hospitals at Al-Hilla city, the study was initiated from 25th September 2020 to 15th March 2022.

3.2. Administrative Arrangements:

Formal administrative approvals to perform the study were obtained prior to data collection, as shown in appendix (A).

1. The first of all the researcher obtains an approval to the protocol of the study from the branch of adult nursing in College of Nursing at University of Babylon, then viewing the protocol of the study to research ethical committee at the college and after that the protocol take the approvement.

2. The second steps after the protocol take the approvement from research ethical committee the protocol take the approvement from co-dean of scientific affair and postgraduate and after that an official letter to facilitate the research mission directed to Directorate of Health in Babylon governorate.

3.Official approval was received from the Babylon health directorate and directed to the center for training and development in the Babylon health directorate, the primary approval took to facilitate the research mission and collect the data from Marjan medical city hospital and Al-Hilla teaching

hospital, and after the meeting of research commitment of training and development center the final decision of Approval to conduct research had obtained.

3.3. The Study Setting:

The study was carried out in Al-Hilla teaching hospitals, the epidemic hospitals at the time of conducting study and collecting data(Marjan medical city hospital and Al-Hilla teaching hospital).

3.4. The Study Sample:

A convenient (non-probability sample) was selected 200 nurses who were working at epidemic hospitals at the time of conducting study and collecting data Marjan medical city hospital and Al-Hilla teaching hospital, the number of nurses in the both hospitals 450 nurses and the total of the bed size that used to COVID-19 cases 520 bed.

Based on the formula of Steven K. Thompson of calculating sample size from the population, the general population 450 nurse from both hospitals, put in the consideration the Marjan medical city hospital as epidemic hospital and whole nurses took in the study and Al-Hilla teaching hospital have one word as epidemic word, based on the previous formula the accessible population calculated 200 nurse as showed in appendix (B). The figure (3-1) showing the sample size formula. The table (3-1) showed the distribution of the settings and sample.

Figure (3-1) sample size formula

Sample Size Calculator

We use Steven K. Thompson equation to calculate the sample size, from the next formula[1]:

$$n = \frac{N \times p(1-p)}{[[N-1 \times (d^2 \div z^2)] + p(1-p)]}$$

Where:
n: sample size (؟)
N: Population size
Z: Confidence level at 95% (1.96)
d: Error proportion (0.05)
p: Probability (50%)

(Steven, 2012)

Table (3-1) Distribution of the settings and sample.

Governorate name	Hospitals	Total number of nurses	Number of selected nurses
Babylon	Al-Hilla teaching hospital	75	40
	Marjan medical city hospital	375	160

3.4.A. Inclusive Criteria:

1. All categories of nursing staff who were working at epidemic hospitals at Marjan medical city hospital and Al-Hilla teaching hospital were included in this study at the time of the study.

2. Both gender

3. Nurses who agreed to participate at the time of the study.

3.5. The study Instrument:

To achieve the purpose of this study, an extensive review of the relevant literature and depending on the main domain of the study; knowledge, attitudes, perceived barriers of infection control.

Many references dependent in each domain developed and for developed of all questionnaire; Knowledge, attitudes, and practices about the coronavirus illness 2019 (COVID-19) among nurses in Lebanon, (Saadeh et al., 2021). Knowledge, attitude, practice, and perceived barriers among health-care personnel regarding COVID-19: a cross-sectional survey from Pakistan, state (Saqlain et al., 2020), the permission of use was took from them and the email message found in the appendix (C).

Both of references the permission and scoring system was took from the researcher by emailing. And also (CDC., 2020), Coronavirus infection control guidance for healthcare professionals (COVID-19), consider as a reference in developed part two, domain two in the questionnaire.

The study a questionnaire was developed depending the previous references by the researcher. It is comprised from mainly four parts, the first one is demographical date contain seven questions, and the second part contain item related nurses' knowledge about COVID-19 which contain two sections; first one I- general information regarding COVID-19 with (10) items and the second is II-Prevention of COVID-19 that contains (8) items. The third part is nurses' attitudes about COVID-19 that contains (10) items and the forth part is perceived barriers to infection control regarding COVID-19 among nurses contains (9) items.

Part I. Demographic data of the sample include (age, gender, educational level, years of employment in nursing, experiences in epidemic units, the source of your information about COVID-19, and training courses and its number about infection control).

Part II. Nurses' knowledge about COVID-19 contain (18) items in two sections.

Section I. General information of nurses regarding COVID-19 contain (10) items, all the questions as multiple choices.

Section II. Prevention of COVID-19 contain (8) items, all the questions as multiple choices.

Part III. Nurses' attitudes about COVID-19 contain (10) items as Likert scale with three scales ;agree, neutral, disagree.

Part III. Nurses' Perceived barriers to infection control practice regarding COVID-19 contain (9) items as Likert scale with three scales ;agree, neutral, disagree. As show in appendix (C).

3.6. Rating and Scoring:

- **Knowledge Scoring:**

The items that found in part two were as multiple choices questions, which are scored as follows: was scored by give the true answer (2), and the false (1). The mean score and cut off point for the overall score

of knowledge were calculated as follows: poor knowledge(1-1.33), moderate knowledge(1.34-1.67),and high knowledge(1.68). The mean score and cut off point for the total score of sub-domain knowledge were calculated to assess the amount of knowledge for each sub-domain: Poor knowledge (1-1.33), moderate knowledge (1.34-1.67), and high knowledge(1.68) were the sub-domains of general information of nurses about COVID-19; the second sub-domain knowledge concerning COVID-19 prevention was likewise poor of knowledge(1-1.33), moderate of knowledge(1.34-1.67), and high of knowledge(1.68).

- **Attitudes Scoring:**

The third part was scored using a Likert scale with three scales: agree = 3, neutral = 2, disagree = 1 for each item, and was estimated by calculating the cut off point for the mean score and managed to score as shown: Negative= (10-16), Neutral= (17-23), Positive= (24-30).

- **Barriers of Infection Control Scoring:**

The forth part scoring with a Likert scale with three scales; agree =3, neutral = 2, disagree =1, for each item and was estimated by responses which presented as frequencies and percentages and also by determining the cut off point for the mean of the score and grading as shown: Negative = (9-15), Neutral= (15.1-21), Positive= (21.1-27).

HS $\leq$ 0.01; S $\leq$ 0.05 - $\geq$ 0.01 ; NS > 0.05

3.7. Questionnaire Validity:

The questionnaire was validated by presenting it to a panel of fifteen 15 experts for examine the content and construct validity. All the experts in nursing specialties except one linguistic expert in Arabic linguistic science, Most of the nursing experts in adult nursing specialty 8 experts, seven experts in community health nursing as the following:

1. (3) Experts from the Nursing College / Babylon University.
2. (6) Experts from the Nursing College / Baghdad University.

3. (3) Experts from the Nursing College /Al-Kufa University.
4. (2) Experts from the Altoosi University College.
5. (1) Expert from the Nursing College/ Al Muthanna University (Appendix D).

A copy of the questionnaire was submitted to each of the experts. They are tasked with reviewing and assessing its content and adequacy include the convert the knowledge domain from Likert scale to multiple-choice question and divide the knowledge domains to subdomain to cover the all the subject. The average number of years of expert experience is (27.4) years. The final draft is ready to be used once the expert's recommendations have been taken into consideration that conformed the study questionnaires were clear, suitable, applicable, and valid.

3.8. Pilot Study:

A small-scale investigation known as a pilot study was carried out between the period 1st of April 2021 to 15en of April 2021, The pilot study was carried out in Marjan medical city hospital and Al-Hilla teaching hospital, the researcher was selected 20 nurses; 15 from the Marjan medical city hospital and 5 nurses from Al-Hilla teaching hospital, the instrument filled out by them and after that reliability was achieved. The researcher conducted the pilot study to:

1. Assess the items accuracy, relevancy and effectiveness of assessing tool.
2. Determine the period of time that needs for collecting data.
3. Testing the study tool' reliability.
4. Identify the obstacles that may be facing the researcher throughout the data gathering procedure.

3.9. Reliability of the Questionnaire:

Reliability was known as the scope by which a consistently measures of concepts throughout instrument (Burns& Grove 2010). The pilot research was carried out to determine the reliability of the research

tool. Cronbach's Alpha was performed to measure the reliability of the present study instrument by the use of the Statistical Package for Social Science Program (IBM SPSS) version 25.0. The reliability of instrument was (r = 0.843, 0.711, 0.762) for knowledge, attitudes and the perceived barriers to infection control regarding COVID-19 variables respectively.

The result of the Cronbach's Alpha reliability of the study tool was statistically high, indicate that the study tool was reliable and has equal measurability. The table (3-2) show the instrument validity.

Table (3-2) indicate this instrument has good reliability.

Reliability Statistics		
Scale	**Cronbach's Alpha**	**No. of Items**
Knowledge related to COVID-19 Scale	0.843	18
Attitudes towards COVID-19 Scale	0.711	10
Perceived Barriers by Nurses regarding infection control of COVID-19 Scale	0.762	9

3.10. Methods of Data Collection:

The data gathering process began with the use of a questionnaire, which was answered by nurses (samples) as a self-report (questionnaire) after explaining the main parts and items to them, the period of data collection was from 12th of June 2021 to 1st of August 2021. To obtain verbal acceptance, the researcher introduced himself to the participants and described the purpose of this study..

The study questionnaire was answered by the respondents (nurses) that are working in the both hospitals after taking the formal approval from health directors and previous hospitals and a permission agreement of participation was obtained. The questionnaires were collected from the respondents after they were delivered to each nurse's staff. The

average time that was taken by the nurse's participants to fill out the questionnaire between (10-20) minutes.

3.11. Analysis of Data Statistically:

The data of the present study are analyzed through the utilization of Statistical Package of Social Sciences (SPSS) version 24 , as well as Microsoft Excel (2010). The researcher employed the statistical data examination techniques to assess the study's findings.

3.11.1. Analysis of data Descriptively :

This strategy was established by determining the following: Frequency and the Percentages.

$$\text{B.} \quad \text{Percentage } (\%) = \frac{\text{Frequencies (F)}}{\text{Size of sample}} \times 100\ \%$$

B. Mean(x)

$$X = \frac{\Sigma X}{N}$$

C. Standard deviation(SD)

$$S.D. = \sqrt{\frac{\Sigma x^2}{n-1}}$$

D. Summary Statistics tables including: Mean, Mean of scores,

$$M.S. = \frac{f1*s1 + f2*s2 + f3*s3}{n}$$

M.S. = Mean of Score, F = frequency, S = score, n = sample size

E. Graphical presentation by using:

a. Bar-chart.
b. Detonated ring.

3.11.2.: Inferential Data Analysis Statistically:

Such analysis wasutilized to indicate the significantly association of study variables.

Independent t-test is used to finding relationship between two group in such as gender and independent variables according to the following formula:

$$t = \frac{X_A - X_B}{\sqrt{S^2_A \quad S^2_B}}$$

(Ingham-Broomfield, 2014)

One-way analysis of variance test (ANOVA): is used to finding relationship between groups in such as age, education level's location, etc. .

$$SSt = n\sum_{i=1}^{k}(\bar{y}_{i.} - \bar{y}_{..})^2$$

$$SST = n\sum_{ij}^{kn}\left(\bar{y}_{ij} - \bar{y}_{i.}\right)^2$$

(Hutchinson et al., 2000)

Table (3-3) ANOVA test

Pearson's correlation: the Pearson's Product Moment Correlation Coefficient (r) can be written as:

Source of Variance	*D.F.*	*SS*	*MS*	$F_{calculated}$	$F_{tabulated}$
Between groups	k-1	SSt	$MSt = \frac{SSt}{k-1}$	$F = \frac{MSt}{MSe}$	$F_{\alpha,(ki1,k(n-1))}$
Within group	k(n-1)	SSe	$MSe = \frac{SSe}{k(n-1)}$		

$$r = \frac{\frac{1}{N}\Sigma xy - \bar{x}\,\bar{y}}{\sqrt{\left(\frac{1}{N}\Sigma x^2 - \bar{x}^2\right)}\sqrt{\left(\frac{1}{N}\Sigma y^2 - \bar{y}^2\right)}}$$

where r = Pearson's Product Moment Correlation Coefficient

N = Number of pairs of values or scores

Σxy = Sum of the products of x and y

$\bar{x}$ = Mean of the x values (or x scores)

$\bar{y}$ = Mean of the y values (or y scores)

$\bar{x}\,\bar{y}$ = Product of the mean values (scores) of x and y

Σx^2 = Sum of squares of x values (or x scores)

Σy^2 = Sum of squares of y values (or y scores)

Chapter Four

Results

Chapter Four

Results of the Study

This chapter extensively introduces the outcomes of the research in tables, and they correspond to the research goals, which are as shown in:

Table (4-1): Distribution of Study Sample by Their Demographic Characteristics:

Demographic data	Rating	Frequency uency	Percent %
Age (years)	21-30	127	63.5
	31-40	54	27.0
	41-50	14	7.0
	>50	5	2.5
	Total	200	100.0 %
Gender	Male	109	54.5
	Female	91	45.5
	Total	200	100.0 %
Educational level	Primary school of nursing	8	4
	Secondary school of nursing	56	28
	Diploma in nursing	81	40.5
	Bachelor in nursing and above	55	27.5
	Total	200	100.0 %
Years of employment in nursing	<5 years	64	32.0
	5-10 years	92	46.0
	>10 years	44	22.0
	Total	200	100.0 %
The experience in	Less than 6 months	61	30.5

epidemic units in month	6-12 months	125	62.5
	More than one months	14	7.0
	Total	200	100.0 %
Sources of information	Social media sites	112	56.0
	Scientific websites	25	12.5
	Library	1	5.0
	Colleagues	62	31.0
	Total	200	100.0 %
Training course about infection control	Not trained	145	72.5
	One session	32	16.0
	Two sessions	17	8.5
	More than two sessions	6	3.0
	Total	200	100.0 %

Table (4-1) show participants age, the mean of age is 30.55+6.424, the age 21-30 years old (*n=127*; 63.5%), followed by those are age 31-40 years and old (*n=54*; 27.0%), followed by those are age 41-50 years and older (*n=14*; 7.00%) and those age >50 years old (*n=5*; 2.5%).

Regarding gender the result in the table (4-1**)** indicate more than a half are male (*n = 109*; 54.5%) compared to females (*n = 91*; 45.5%).

Regarding educational qualification the result in table (4-1) indicate most of study sample had a Diploma degree (n=81; 40.5%), followed by those who are Nursing school graduated (n=56; 28%), followed by those who had a Bachelor in nursing degree (n = 55; 27.5%) and those who are Primary school of nursing (n = 8; 4%).

The results in table (4-1) show the years of experience in nursing that indicate most of them have 5-10 years of experience (*n = 92*; 46.0%) followed by group who had <5 years of experience (*n = 64*;

32.0%), and followed by those who had more than 10 years (*n = 44*; 22.0%).

Regarding experience in epidemiological wards table (4-1) depict the most of nurses have 6-12 months (*n=125*; 62.5%), followed by those who had less than 6 months(*n = 61*; 30.5%), followed by those who had more than one months (*n = 14*; 7.0%).

The results in table (4-1) show the sources of knowledge, which clear that most of nurses use social media sites (*n=112*; 56.0%), followed by those who depend on their Colleagues (*n = 62*; 31.0%), followed by those who used Scientific websites (*n = 25*; 12.5%) and followed by those who are used Library *(n=1; 5.0%)*.

In term of training course about infection control, table (4-1) show most of nurses did not trained (*n = 145*; 72.5%) followed by those who had one session (*n = 32*; 16.0%), followed by those who had two sessions (*n = 17*; 8.5%), and followed by those who had more than two sessions (*n = 6*; 3.0%).

Table(4-2-1): Nurses' Knowledge related to General Information regarding to COVID-19:

No	General Information of COVID-19	M.S. ± S.D.	Assessment
1	COVID-19 is?	1.71±0.454	Moderate
2	The incubation period of the COVID-19 is?	1.48±0.500	Moderate
3	The mode of transmission for COVID-19 is?	1.43±0.496	Moderate
4	The main symptom of COVID-19 is ?	1.52±0.500	Moderate
5	Confirmatory diagnosis for COVID-19 is?	1.14±0.347	Poor
6	The high-risk population of COVID-19 for the severe outcome is?	1.39±0.488	Moderate
7	The therapeutic management option for COVID-19	1.37±0.484	Poor
8	Complications of COVID-19 is?	1.27±0.445	Poor
9	The mortality rate of COVID-19 is?	1.25±0.434	Poor
10	The virus causing the COVID-19 is?	1.23±0.421	Poor

"M.S.= Mean of score, Poor (mean of score 1-1.33), Moderate (mean of score 1.34-1.67), High (mean of score ≥1.68), S.D= Stander deviation"

The results in table (4-2-1) take in consideration statistical analysis of mean, indicate the nurses' knowledge regard of general information of the COVID-19 had moderate responses at half of items (mean =1.34-1.67) except, items number (5, 7, 8, 9, and 10) the responses were poor level of knowledge (mean= 1-1.33).

Table(4-2-2): Overall Knowledge related to General Information Regarding to COVID-19:

Level	Frequency	%	M.S. ± S.D
Poor	87	43.5	**1.37±0.197**
Moderate	100	50.0	
High	13	6.5	
Total	**200**	**100.0**	

M.S.= Mean of score, S.D: Standard Deviation

(Poor= 1-1.33, Moderate= 1.34-1.67, High ≥1.68)

The results in table (4-2-2) show the overall nurses' knowledge, the findings indicate that the nurses have moderate knowledge related to general information about COVID-19 (*n=100*; 50%) followed by those who have poor knowledge (*n=87*; 43.5%), and followed by those who have high level of knowledge (*n=13*; 6.5%).

Table(4-2-3):Knowledge related to Prevention of COVID-19:

No	Prevention of COVID-19	M.S. ± S.D.	Assessment
1	Preventive measures for COVID-19 infection is?	1.26±0.442	Poor
2	An action that helps in prevention of COVID-19 is?	1.24±0.428	Poor
3	The COVID-19 transmitted through?	1.3±0.459	Poor
4	The ways that prevent the spread of COVID-19 include?	1.29±0.457	Poor
5	For COVID-19, the period of quarantine is ____ from the last date of exposure, because this is the longest incubation period (the span of time during	1.3±0.459	Poor

	which people have developed illness after exposure).		
6	Wearing a mask is important for prevent the transmission of disease whenever being the Individual commitment to the following principles...	1.27±0.447	Poor
	---------- An Important Ways to Slow the Spread of COVID-19.	1.26±0.442	Poor
8	Cover the mouth and the nose through coughing and sneezing is important for prevent the transmission of COVID-19 when you are commitment the following rule…	1.34±0.476	Moderate

"M.S.= Mean of score, Poor (mean of score 1-1.33), Moderate (mean of score 1.34-1.67), High (mean of score ≥1.68), S.D= Stander deviation"

The results in table (4-2-3) indicate in the light of statistical mean analysis the nurses' knowledge regarding prevention of the COVID-19 are a poor knowledge at all items (mean =1-1.33) except, items number (8) the responses are moderate level of knowledge (mean= 1.34-1.67).

Table(4-2-4):Overall Knowledge related to Prevention of COVID-19:

Level	Frequency	%	M.S. ± S.D
Poor	118	59.0	**1.28±0.227**
Moderate	68	34.0	
High	14	7.0	
Total	**200**	**100.0**	

M.S.= Mean of score, S.D: Standard Deviation

(Poor= 1-1.33, Moderate= 1.34-1.67, High ≥1.68)

The results in the table (4-2-4) indicate that the nurses have a poor knowledge related to prevention of COVID-19 (*n=118*; 59%), followed by those who have moderate knowledge (*n=68*; 34%), followed by those who have a high level of knowledge (*n=14*; 7%).

Table(4-2-5):Overall Knowledge related to COVID-19:

Level	Frequency	%	M.S. ± S.D
Poor	117	**58.5**	**1.33±0.154**
Moderate	79	39.5	
High	4	2.0	
Total	**200**	**100.0**	

M.S.= Mean of score, S.D: Standard Deviation

(Poor= 1-1.33, Moderate= 1.34-1.67, High ≥1.68)

The results in the table (4-2-5) declared that the nurses have a poor knowledge related to COVID-19 (*n=117*; 58%), followed by those who have moderate knowledge (*n=79*; 39.5%), followed by those who have high level of knowledge (*n=4*; 2%) figure (4-1).

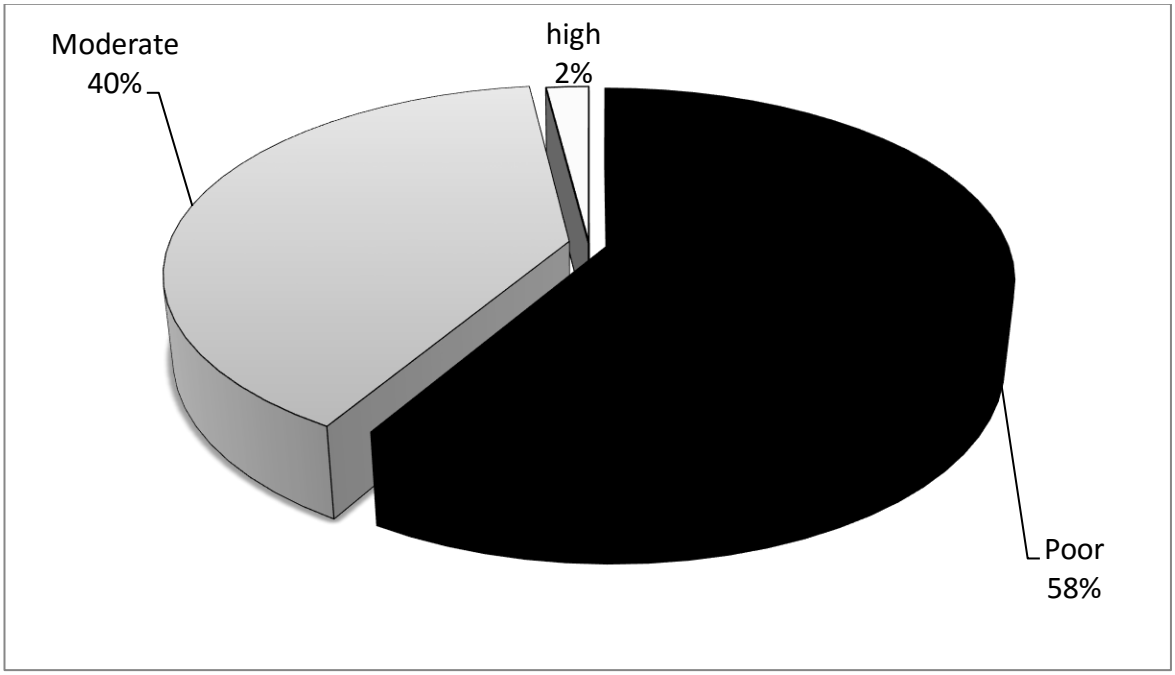


Figure (4-1): Overall Assessment of Nurses Knowledge:

Table(4-3-1): Assessment of Nurses Attitudes regarding COVID-19:

No	Nurses Attitudes items	Rating	F	%	M.S. ± S.D.	Assessment
1	Do you believe COVID-19 will be effectively managed at some point?	Disagree	12	6.0	2.6±0.602	Neutral
		Neutral	56	28.0		
		Agree	132	66.0		
		Total	200	100.0		

2	Do you believe Iraq will be successful in its fight against COVID-19 disease?	Disagree	24	12.0	2.29±0.671	Neutral
		Neutral	93	46.5		
		Agree	83	41.5		
		Total	200	100.0		
3	I believe that an asymptomatic patient can transmit the virus to others	Disagree	17	8.5	2.73±0.605	Positive
		Neutral	19	9.5		
		Agree	164	82.0		
		Total	200	100.0		
4	I am always worried about transmitting the virus to my family, friends & society.	Disagree	11	5.5	2.82±0.509	Positive
		Neutral	14	7.0		
		Agree	175	87.5		
		Total	200	100.0		
5	If you are infected with COVID-19, you will agree to be isolated in a medical facility.	Disagree	28	14.0	2.57±0.726	Positive
		Neutral	30	15.0		
		Agree	142	71.0		
		Total	200	100.0		
6	COVID-19 spread may be avoided by routinely washing hands with using soap.	Disagree	16	8.0	2.59±0.636	Positive
		Neutral	50	25.0		
		Agree	134	67.0		
		Total	200	100.0		
7	COVID-19 prevalence may be lowered by health-care-professionals actively participating in hospital infection control measures.	Disagree	11	5.5	2.69±0.571	Positive
		Neutral	40	20.0		
		Agree	149	74.5		
		Total	200	100.0		
8	I would get a COVID-19 vaccination if it was available.	Disagree	18	9.0	2.63±0.644	Positive
		Neutral	38	19.0		
		Agree	144	72.0		
		Total	200	100.0		
9	Patients infected with COVID-19 should be isolated.	Disagree	12	6.0	2.78±0.541	Positive
		Neutral	20	10.0		
		Agree	168	84.0		
		Total	200	100.0		
10	Medical staff are ready to	Disagree	7	3.5	2.76±0.501	Positive

	participate in anti-epidemic procedures in the Iraq community.	Neutral	33	16.5		
		Agree	160	80.0		
		Total	200	100.0		

"F=Frequency uency, %= Percentage, M.S.= Mean of score, Cut off point (0.66), Negative (M.S.= 1-1.66), Neutral (M.S.= 1.67-2.33), Positive (M.S. ≥2.34), S.D= Stander deviation"

Take in to account cut-off point, table (4-3-1) illustrates the nurses responses have positive attitudes about COVID-19 (M.S.≥ 2.34) excepting, items (1&2) the responding remained neutral attitudes (M.S.=1.67-2.33).

Table(4-3-2):Overall Assessment of Attitudes towards COVID-19:

Level	Frequency	%	M.S. ± S.D
Negative	7	3.5	**26.47±3.988**
Neutral	21	10.5	
Positive	172	86.0	
Total	**200**	**100.0**	

M: Mean for total score, S.D: Standard Deviation for total score

(Negative= 10-16, Neutral= 17-23, Positive= 24-30)

The results in table (4-3-2) through the analysis of attitudes towards COVID-19 demonstrate at mean ± S.D.= 26.47±3.988; the nurses express positive attitudes towards COVID-19 (*n=172*; %=86). Figure (4-2)

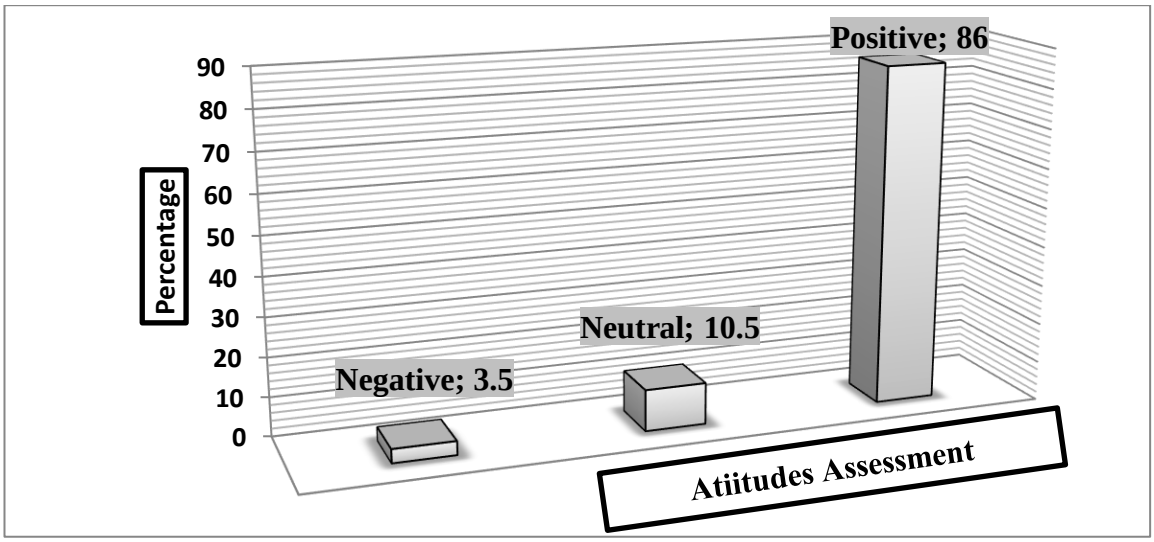


Figure (4-2): Overall Nurses Attitudes towards COVID-19:

Table(4-4-1):Assessment of Perceived Barriers by Nurses regarding infection control of COVID-19:

No	Nurses Attitudes items	Rating	F	%	M.S. ± S.D.	Assessment
1	Lack in understanding of the disease's rout of spread COVID-19.	Agree	128	64.0	1.5±0.730	Agree
		Neutral	44	22.0		
		Disagree	28	14.0		
		Total	200	100.0		
2	Not commitment to wearing personal protective equipment while examine or contact with the patient.	Agree	130	65.0	1.53±0.789	Agree
		Neutral	33	16.5		
		Disagree	37	18.5		
		Total	200	100.0		
3	Limitation of infection control materials.	Agree	141	70.5	1.37±0.621	Agree
		Neutral	44	22.0		
		Disagree	15	7.5		
		Total	200	100.0		
4	Not commitment to hand washing after examine or contact with the patient.	Agree	138	69.0	1.48±0.776	Agree
		Neutral	27	13.5		
		Disagree	35	17.5		
		Total	200	100.0		
5	Infection prevention and control policies and	Agree	130	65.0	1.45±0.678	Agree
		Neutral	49	24.5		

	practices are inadequate.	Disagree	21	10.5		
		Total	200	100.0		
6	Inadequate training in the measurement of standard precautions.	Agree	128	64.0	1.46±0.671	Agree
		Neutral	52	26.0		
		Disagree	20	10.0		
		Total	200	100.0		
7	lower level of commitment among health-care professionals to infection-control guidelines?	Agree	132	66.0	1.49±0.750	Agree
		Neutral	37	18.5		
		Disagree	31	15.5		
		Total	200	100.0		
8	For COVID-19 cases, there are no specific technical or treatment guidelines.	Agree	107	53.5	1.59±0.710	Agree
		Neutral	67	33.5		
		Disagree	26	13.0		
		Total	200	100.0		
9	Overcrowding of the emergency room and overload number of patients in hospital more than its limit capacity.	Agree	149	74.5	1.31±0.581	Agree
		Neutral	39	19.5		
		Disagree	12	6.0		
		Total	200	100.0		

"F=Frequency, %= Percentage, M.S.= Mean of score, Cut off point (0.66), Agree (M.S.= 1-1.66), Neutral (M.S.= 1.67-2.33), Disagree (M.S. ≥2.34), S.D= Stander deviation"

The results in table (4-4) take in the consideration cut-off point, demonstrate that the nurses responses agree for all the present items as a barriers for the prevention of COVID-19 (M.S.1-1.66).

Table(4-4-2):Overall Assessment of Perceived Barriers by Nurses regarding infection control of COVID-19:

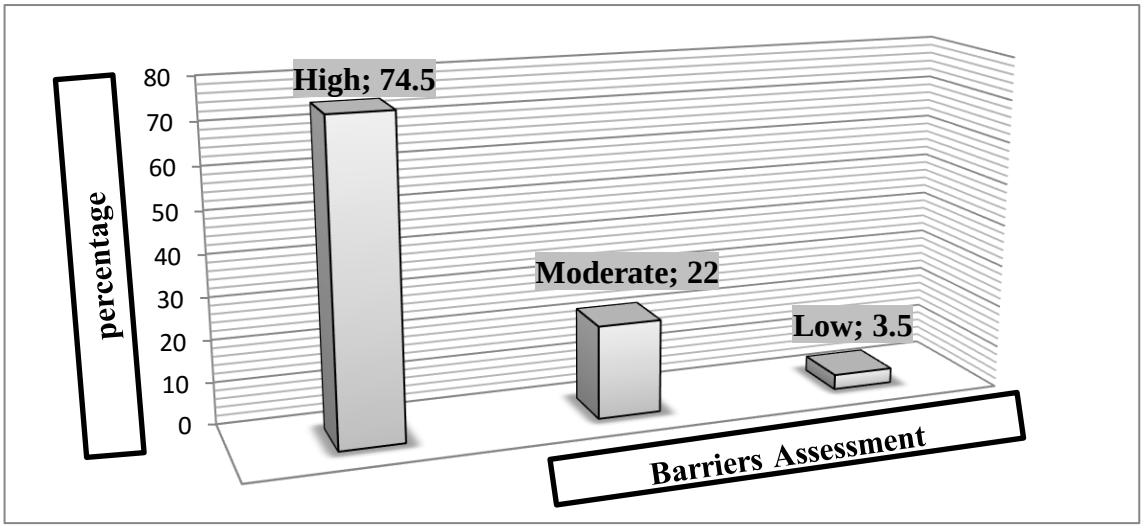
Level	Frequency	%	M.S. ± S.D
High	149	74.5	**13.21±4.656**
Moderate	44	22.0	
Low	7	3.5	

Total	**200**	**100.0**	

M: Mean for total score, S.D: Standard Deviation for total score

(Negative= 9-15, Neutral= 15.1-21, Positive= 21.1-27)

The results in table (4-4-2) showed through the analysis of perceived barriers by nurses regarding infection control of COVID-19 at mean ± S.D.= 13.21±4.656; the nurses express high level of barriers towards infection control of COVID-19 (*n=149*; %=74.5). Figure(4-3).



Figure(4-3): Overall Perceived Barriers by Nurses towards infection control of COVID-19:

Table(4-5-1): Significant Differences in Nurses Knowledge, Attitudes and Perceived Barriers with the Age (n=200):

Age	Alteration Source	Summation of Squares	D.F	Squaring Mean	F	P,≤ 0.05
Nurses Knowledge towards COVID-19	Between Groups	.130	3	.043	1.841	0.141 No-sig.
	Within Groups	4.619	196	.024		
	Total	4.749	199			
Nurses Attitudes towards COVID-19	Between Groups	1.521	3	.507	3.297	0.022 Sig.
	Within Groups	30.138	196	.154		
	Total	31.659	199			
Barriers of Infection Control	Between Groups	2.718	3	.906	3.513	0.016 Sig.
	Within Groups	50.556	196	.258		

	Total	53.274	199			

D.F: Degree of freedom, F: F-statistic, Sig: Significance

The results in table (4-5-1) displays; there are a significant variances in the attitudes and perceived barriers of infection control regarding COVID-19 at *p-value* ≤ 0.05 related to nurses ages, and there are non-important variances in knowledge of COVID-19 *at p-value* >0.05 related to nurses ages.

Table(4-5-2):Significant Differences in Nurses Knowledge, Attitudes and Barriers with regards Gender (n=200):

Gender Variables		**Mean**	**S.D**	**t-value**	**D.F**	**p≤ 0.05**
Nurses Knowledge towards COVID-19	**Male**	1.32	0.148	1.419	198	0.248 No-sig.
	Female	1.35	0.160			
Nurses Attitudes towards COVID-19	**Male**	2.62	0.456	1.025	198	0.101 No-sig.
	Female	2.67	0.315			
Barriers of Infection Control	**Male**	1.47	0.526	0.308	198	0.556 No-sig.
	Female	1.45	0.509			

M: Mean, SD: Standard deviation, t: t-test, D.F: Degree of freedom, Sig: Significance, p: Probability value, N.S: Not significant, S: Significant, H.S: High significant

The results in table (4-5-2) illustrate there are non-important variances in knowledge, attitudes and perceived barriers of infection control of COVID-19 with regard to nurses gender at *p-value* >0.05.

Table(4-5-3):Significant Differences in Nurses Knowledge, Attitudes and Barriers with regards Education Level (n=200):

Education Level	**Alteration Source**	**Summation of Squares**	**D.F**	**Squaring Mean**	**F**	**P,≤ 0.05**
Nurses Knowledge towards COVID-19	Between Groups	.445	3	.148	6.757	0.000 Sig.
	Within Groups	4.304	196	.022		

	Total	4.749	199			
Nurses Attitudes towards COVID-19	Between Groups	1.889	3	.630	4.146	0.007 Sig.
	Within Groups	29.770	196	.152		
	Total	31.659	199			
Barriers of Infection Control	Between Groups	3.805	3	1.268	5.025	0.002 Sig.
	Within Groups	49.469	196	.252		
	Total	53.274	199			

D.F: Degree of freedom, F: F-statistic, Sig: Significance

The results in table (4-5-3) demonstrate there are important variances in knowledge, attitudes and perceived barriers of infection control of COVID-19 at *p-value* ≤ 0.05 related to nurses' education level.

Table(4-5-4):Significant Differences in Nurses Knowledge, Attitudes and Barriers with regards Years of Experience (n=200):

Years of Experience	**Alteration Source**	**Summation of Squares**	**D.F**	**Squaring Mean**	**F**	**P,≤ 0.05**
Nurses Knowledge towards COVID-19	Between Groups	.102	2	.051	2.171	0.117 No-sig.
	Within Groups	4.647	197	.024		
	Total	4.749	199			
Nurses Attitudes towards COVID-19	Between Groups	1.320	2	.660	4.287	0.015 Sig.
	Within Groups	30.338	197	.154		
	Total	31.659	199			
Barriers of Infection Control	Between Groups	6.499	2	3.249	13.686	0.001 Sig.
	Within	46.775	197	.237		

	Groups					
	Total	53.274	199			

D.F: Degree of freedom, F: F-statistic, Sig: Significance

The results in table (4-5-4) displays that are important variances in attitudes and perceived barriers to infection control of COVID-19 at *p-value* ≤ 0.05 with regard to nurses' experience years, and there are no-significant differences in knowledge of COVID-19 with regard to nurses years of experience *at p-value >0.05*.

Table(4-5-5): Significant Differences in Nurses Knowledge, Attitudes and Barriers with regards to Experience in Epidemiological Wards (n=200):

Experience	Alteration Source	Summation of Squares	D.F	Squaring Mean	F.	P,≤ 0.05
Nurses Knowledge towards COVID-19	Between Groups	.197	2	.098	4.260	0.015 Sig.
	Within Groups	4.552	197	.023		
	Total	4.749	199			
Nurses Attitudes towards COVID-19	Between Groups	.189	2	.095	.593	0.554 No-sig.
	Within Groups	31.469	197	.160		
	Total	31.659	199			
Barriers of Infection Control	Between Groups	4.265	2	2.133	8.572	0.001 Sig.
	Within Groups	49.009	197	.249		
	Total	53.274	199			

D.F: Degree of freedom, F: F-statistic, Sig: Significance

The results in table (4-5-5) displays that are a significant differences in knowledge and perceived barriers of infection control of COVID-19 with regard to nurses experience in epidemiological wards at

p-value ≤*0.05*, and there are no-significant differences in attitudes of COVID-19 with regard to nurses experience epidemiological wards *at p-value >0.05*.

Table 4-5-6:Significant Differences in Nurses Knowledge, Attitudes and Barriers with regards the source of nurses' information about COVID-19 (n=200):

Sources of knowledge	Alteration - Source	Summation-of Squares	D.F	Squaring Mean	F.	P,≤ 0.05
Nurses Knowledge towards COVID-19	Between Groups	.244	3	.081	3.531	0.016 Sig.
	Within Groups	4.506	196	.023		
	Total	4.749	199			
Nurses Attitudes towards COVID-19	Between Groups	.024	3	.008	.050	0.985 No-sig.
	Within Groups	31.635	196	.161		
	Total	31.659	199			
Barriers of Infection Control	Between Groups	4.657	3	1.552	6.258	0.002 Sig.
	Within Groups	48.617	196	.248		
	Total	53.274	199			

D.F: Degree of freedom, F: F-statistic, Sig: Significance

The results in the table (4-5-6) show that there are a significant differences in knowledge and perceived barriers of infection control of COVID-19 with regard to the source of nurses' information about COVID-19 at *p-value* ≤*0.05*, and there are no-significant differences in attitudes of COVID-19 with regard the source of nurses' information about COVID-19 *at p-value >0.05*.

Table(4-5-7):Significant Differences in Nurses Knowledge, Attitudes and Barriers with regards Training Courses regarding Infection Control (n=200):

Training	Alteration Source	Summat-ion of Squares	D.F	Squaring- Mean	F.	P,≤ 0.05
Nurses Knowledge towards COVID-19	Between Groups	.131	3	.044	1.860	0.138 No-sig.
	Within Groups	4.618	196	.024		
	Total	4.749	199			
Nurses Attitudes towards COVID-19	Between Groups	.121	3	.040	.250	0.861 No-sig.
	Within Groups	31.538	196	.161		
	Total	31.659	199			
Barriers of Infection Control	Between Groups	5.457	3	1.819	7.456	0.000 Sig.
	Within Groups	47.817	196	.244		
	Total	53.274	199			

D.F: Degree of freedom, F: F-statistic, Sig: Significance

The result in the table (4-5-7) displays that are a significant differences in perceived barriers of infection control of COVID-19 with regard to nurses training courses at *p-value ≤0.05*, and there are no-significant differences in knowledge and attitudes of COVID-19 with regard to nurses training courses regarding infection control *at p-value >0.05*.

Table(4-6). Correlation of Knowledge, Attitudes and Perceived Barriers to Infections Control Regarding COVID-19 Among Nurses:

Variables	*Pearson correlation*	*Sig. (2-tailed)*	*Significance*
Knowledge- Attitudes	0.227	0.001	**HS**
Knowledge -Perceived Barriers	0.135	0.033	**S**

Attitudes - Perceived Barriers	0.186	0.045	**S**

HS: Highly Significant, S: Significant

HS < 0.01; S < 0.05 - ≥ 0.01 ; NS > 0.05

The results in table (4-6) demonstrate that are highly a significant correlation (positive) in nurses' knowledge towards COVID-19 with regard their attitudes and also a significant correlation between a nurses' knowledge and perceived barriers of infection control and in the same regard between nurses' attitudes and perceived barriers of infection control by nurses.

Chapter five

Discussions

Chapter Five

Discussion the Results of the Study

The current study results throughout this chapter are systematically organized, interpretation, and reasonably derived the view of evidence that supports the finding which are accessible in related studies. Preserving the health of health care providers had a now became one of the main concerns of all countries affected by the corona-virus. Maintaining the health of the hospital workers, especially the nursing staff, requires knowledge and attitude and identify the barrier of infection control that perceived by nurses who were working in direct touch fighting this virus.

5.1. Demographic Characteristics of Nurses Who Works in Epidemic Units:

The findings in table (4-1) are a point out the majority (63.5%) of the nurses in the early adult ages within age group (21-30) years old, this finding illustrate the policy of the higher health authorities to employ newly graduates to fill the shortage of nursing staff. These findings were agreed with Hossain *et al.*, (2021) who conducted a study in five different districts of Bangladesh. In their study, they found that the most (76.8%) of HCWs were aged between 21 and 30 years old.

In relate to gender, the finding of the study in table (4-1) are reveal about more than half (54%) of the nurses are male and the remaining percent are female, it is common that male nurses are more than female nurses in our culture especially in epidemic hospitals, in addition, the Iraqi society traditions consider nursing is a difficult job for female nurses. These findings were compatible with Zhang *et al.*, (2020), who conducted the study across (10) hospitals in Henan, China , that revealed that a slight more than half of the study samples (53.4%) of HCWs were male and only (46.7 %) of them were female.

Concerning the educational level, the finding of the study in table (4-1), declare that most (40.5%) of the nurses have a diploma degree, because of the major proportion of nursing staff in the health institutions were with diploma degree, because of the large numbers of technical institutes and higher health institutes that graduate diploma degrees rather than other degrees of nursing. These findings were supported by a study conducted by Sahar *et al*., (2020), who conducted the study on public health nurses (PHN) in Indonesia, which declared that about (61.4%) of the study sample held a diploma in nursing.

Moreover , in relate to the years of experience the findings in table (4-1) depict that most (46.0%) of nurses have between (five to ten) years of practices in the field of nursing , which illustrate the employment newly graduates nursing staff because the newly trend of previous governments to employ nurse with different specialties to provide all the health institutions with nursing staff and help in reduce shortage in nursing. These findings were agreed with Saqlain *et al*., (2020), who conducted a cross-sectional study in Pakistan, this study declare that about (54.7) of nurses who participated in the study had more than five years' experiences in nursing field.

Concerning the experiences in epidemiological wards the findings in table (4-1) show that most (62.5%) of nursing staff have between six to twelve months experiences in epidemiological wards, which illustrate the short period of nurses experience which may be due to the short period of time between the pandemic outbreak and time of conducting the study especially at the setting of the study. These findings nearly match with Chau *et al*., (2021), who conducted a study in hospitals and a public health department in Hong Kong, in this study which showed that about half (54 %) of the nurses had from five to eight month working in caring of COVID- 19 patients.

As well as, the findings in table (4-1) show that most (56.0%) of nurses takes the social-media as their information' sources about COVID-19, because the lack of peer discussion, and misleading information and also lack of the feasibility of take accurate information which may be correct or not correct from the social media and other inaccurate sources. These findings were reinforced by Sahar *et al*., (2020), who carried out study on Indonesian' public health nurses, they revealed that a near of half (40.2 %) of the nurses considered the use of social-media as a source of knowledge on COVID-19 by nurses.

Regarding the training course about infection control, the current study show in table (4-1) most (72.5%) of them don't have training about infection control, this finding illustrate that there aren't an attention about infection control program by the hospital continues education and there aren't follow-up to implement it in the setting of the study. These findings were agreed with Tamang *et al*., (2020), they conducted a national survey in Nepal among frontline healthcare professionals, they found more than half (56.2%) of nurses didn't had a training about infection control practices.

5.2.1. Overall Knowledge Related to General Information Regarding to COVID-19:

The findings in the table (4-2-2) demonstrate that about half (50%) of participants have moderate knowledge associated to general information about COVID-19, that mean the level of knowledge is accept at the time of conducting study, although they need more sessions and training courses to improve the level of nurses' knowledge to increase the quality of care and to decrease the mortality rate. These findings were supported by Uzuntarla& Ceyhan (2020), this study was carried out in two state hospitals in Ankara and Bingol, Turkey. The results of this study indicated that about (85%) of the participants had a moderate knowledge

towards COVID-19, as well as the study conducted in Italy by Moro *et al*.,(2020), it was found that the healthcare workers had sufficient knowledge, the mean of correct answers for questions on general aspects of 2019-nCoV epidemic was (71.6%) for HCWs and the mean of correct answers for questions on 2019-nCoV patient management was (57.8%) among HCWs.

5.2.2. Overall Knowledge Related to Prevention COVID-19:

The findings in table (4-2-4) indicate that about most (59%) of the nurses have a poor knowledge relate to the prevention of COVID-19, they declare that the nurses aren't aware about preventive measurements that may be relate to there aren't a specific precaution measurements, modes of transmission and also non-identified incubation period to generalized this information to all health care settings. These findings agreed with Shrestha *et al*., (2021), this study was carried out among the community health workers of various provinces of Nepal, they declared that about 45.9% of the participants had no availability of COVID-19 therapeutic items for inhibition of COVID-19 prevention at their particular health services. In addition, the finding of current study compatible with the study of Alao *et al*., (2020), this study was conducted in Southwest and Northwest Nigeria, they revealed that widely of the HCWs had a poor information regarding PPE. Only a small percentage about (14.0%) of the participants knew about the item of components the standard of PPE.

5.2.3. Overall Knowledge Related to COVID-19:

The findings in table (4-2-4) declare that about most (58%) of the nurses have poor knowledge related to COVID-19, this seems a reasonable findings because there weren't available standard guide or standard information about covid-19 from WHO , CDC and also from Iraqi governorate or health care provider at that time. These findings were

in consistent with study by Bhagavathula *et al*., (2020), a web-based, cross-sectional study was conducted using a survey tool to obtain replies from HCWs through the worldwide, which was pointed out there was a significant proportion of contributors about (61.0%) of HCWs had a poor knowledge regarding to the spread of COVID-19 and about (63.6%) of HCWs also had a poor knowledge related to COVID-19 symptoms. In this regard, A cross-sectional study was caried out in Libya between (HCW) by Elhadi *et al*., (2020), they reported there were a low of total knowledge scores (26.5%) between frontline health-care workers, the findings revealed that only 31.7 percent of all participants were aware of the signs of COVID-19 infection in nurses. PPE was also known by 45.3 percent of nurses. Surprisingly, just 43.2 percent of nurses knew how to avoid COVID-19 transmission by using adequate hand washing and hand hygiene procedures.

5. 3. Overall Nurses Attitudes towards COVID-19:

The findings in table (4-3-2) show the analysis of attitudes towards COVID-19 demonstrate that the majority (86 %) of nurses are express a positive attitudes towards COVID-19, which illustrate the nurses have psychological attention to overcoming the COVID-19 pandemic. These findings agreed with Limbu *et al*., (2020), which conducted in Bhairahawa, Nepal. In this study they showed that (53.4) percent of healthcare professionals had seen positively toward COVID-19. Moreover, another study conducted by Nepal *et al*., (2020), in numerous health foundations sited in Chitwan area of Nepal, which illustrated that the majority (90.93%) of respondents were had a positive attitude regarding COVID-19.

5. 4. Overall Perceived Barriers by Nurses towards infection control of COVID-19:

The findings table (4-4-2), show the analysis of perceived barriers by nurses regarding infection control of COVID-19, this table demonstrate that the most (74.5 %) of the nurses have express high level of barriers towards infection control of COVID-19, this can be explain that nurses have a poor knowledge regarding COVID-19 because the poor knowledge considered one of the barriers that perceived by the nurses regarding infection control of COVID-19. These findings were compatible with a cross-sectional study conducted in Pakistan by Saqlain *et al*., (2020), the results of this study revealed that the items of barriers which they perceived by HCPs which included the overcapacity at the emergency department (52.9%), little infection control equipment (50.7%), and lack of awareness about spread of COVID-19(40.6%) were considered the major barriers in infection control regarding COVID-19.

In this regard, the current finding supported by Birihane *et al*., (2020), this study showed that nearly two-thirds of healthcare professionals in Debretabor, north central Ethiopia, believed that overcapacity in the emergency department was a barrier to infection control practice (66.12 percent). Almost half (51.37 percent) cited a lack of provider commitment as a hindrance. Healthcare professionals reported insufficient training (68.85 percent), a lack of infection control policy (55.2 percent), no hand washing after contacting patients (52.4 percent), a lack of infection control equipment (71.04 percent), and not wearing a mask (43.17 percent) as barriers to implementing perceived precautionary measures.

5.5.1. Differences in Nurses Knowledge, Attitudes and Perceived Barriers to Infection Control Regarding COVID-19 with their Age:

Findings in table (4-5-1) displays there are important variances in the attitudes and perceived barriers of infection control of COVID-19 at p-value $\leq$ 0.05 in relating to nurses' ages, there are non-important variances in knowledge of COVID-19 in regard to nurses age at p-value >0.05. This mean that there was no changing or differencing will happen in nurses knowledge if change occur in the age of the nurses , while a different nurses' age may lead to the change in nurses' attitude and in the barrier to infection control regarding COVID-19 perceived by nurses. These findings were supported by Nemati *et al.*, (2020), who conducted this study in Shiraz, Iran, they pointed out that the total knowledge score was not affected by age of nurses. Moreover, the findings of their study were similar to study of Limbu *et al.*, (2020), who conducted this study in Bhairahawa, Nepal. The findings of their study declared that the attitude was differed substantially as the individuals' ages became older(at p = 0.02).

5.5.2. Differences in Nurses Knowledge, Attitudes and Perceived Barriers to Infection Control Regarding COVID-19 with Their Gender:

The findings in table (4-5-2) illustrate that are no-significant differences between nurses' knowledge, attitudes and perceived barriers of infection control of COVID-19 with regard to nurses gender at *p-value >0.05*. That can explained there aren't variance occur in the nurses' knowledge whenever the gender variance and the same occur with other variables; attitudes and perceived barriers of infection control of COVID-19. In this regard, these finding was supported by Temsah *et al.*, (2020), who conducted their study in Saudi Arabia at a tertiary hospital. They found that there were no variances in knowledge scores between both men

and women. In addition to, these findings also agreed with Limbu *et al*., (2020), who conducted their study in Bhairahawa, Nepal. This study finding pointed out that there was no important differences (at p = 0.66) in the attitudes of participants with their gender.

5.5.3. Differences in Nurses Knowledge, Attitudes and Perceived Barriers to Infection Control of COVID-19 with Their Education Level:

The findings in table (4-5-3) demonstrate that there are significant differences between nurses' knowledge, attitudes and perceived barriers of infection control of COVID-19 at *p-value* ≤ 0.05,with regard to nurses' educational levels. These findings declare that the educational level variance in high or low education that lead to variance in nurses' knowledge in different directions, that explain the actual relationship between education level and level of nurses' knowledge, attitudes and perceiving barriers to infections control of COVID-19, the educated nurse expect to express a good knowledge, a positive attitude and less barrier to infection control especially the barrier that related to knowledge and the update information relating to disease. These findings agreed with Shawahna (2021), the study was conducted in the Occupied Palestinian Territory, the study findings showed that nurses who had a high academic achievements express high positive attitude compared to nurses who did not had a high academic achievements. Moreover, these finding supported by Almohammed *et al*., (2021), who conducted their study in Riyadh, Saudi Arabia. This study illustrated that the participants who had higher education levels were respondents with lesser educational levels had less knowledge and a more optimistic attitude (p 0.001).

5.5.4. Differences in Nurses Knowledge, Attitudes and Perceived Barriers to Infection Control regarding COVID-19 with Their Years of Experience:

The findings in table (4-5-4) displays that there are a significant differences between nurses' attitudes and their perceived barriers of infection control of COVID-19 at *p-value* ≤ 0.05 with the practicing years in nursing, and there are not important variances in nurses' knowledge relating COVID-19 with regard to nurses years of experience at *p-value* >0.05. The finding regarding the nurses' attitude and their perceived barriers to infection control of COVID-19 can be explain that what happen actually because these variables probably affect by increase or decrease the number years of experience in nursing, rather than the knowledge which also may be affect but the research finding show the opposite result, which may explain that because being the idea was new and all the nurses acquired the same information at the same time with different experiences in nursing. These findings were supported with Al-Dossary *et al*., (2020), who conducted a study in Saudi Arabia across five regions, this study was stated that related to the groups of the experience, there was a statistically significant differences between participants in the domain of the attitudes and nurses experiences at p-value. In the same regard these findings were supported by the study which carried out by Sahar *et al*., (2020), who was conducted a study in Indonesia to the public health nurses (PHN), which revealed that in the additional analysis of study result that confirmed the attitudes were meaningfully varied with different working experiences, also with sources of COVID-19 information.

5.5.5. Differences in Nurses Knowledge, Attitudes and Perceived Barriers to Infection Control regarding COVID-19 with Their Experience in Epidemiological Wards:

The findings in table (4-5-5) displays that there are a significant differences between nurses' knowledge and perceived barriers of infection control of COVID-19 with the nurses experience in epidemiological wards (*p-value ≤0.05)*, and there are not important differences among nurses' attitudes of COVID-19 with the nurses experience epidemiological wards *at p-value >0.05*. That show how the experiences in the epidemiological wards have relation with a pervious variables because through the experiences of nurses they learn new information and acquire new practices and can be expose to explore the new barrier that is perceived throughout the experiences in the epidemiological settings. These findings match with Chau *et al*., (2021), who conducted a study in the hospitals and a public health section in Hong Kong, in this study they indicated that the important influencing factor in epidemiological settings was the working experiences in the epidemiological wards, which was significantly associated with the knowledge and practice scores.

5.5.6. Differences in Nurses Knowledge, Attitudes and Barriers Perceived to Infection Control Regarding COVID-19 with Their Nurses' Source of Information:

The findings in table (4-5-6) show that there are a significant differences in nurses' knowledge and perceived barriers to infection control of COVID-19 with regard the nurses' source of information about COVID-19 (p-value ≤0.05), and there are not important differences in attitudes of COVID-19 (*at p-value >0.05)* with regard the nurses' source of information about COVID-19. All these findings show the important role of the nurses' source of information about COVID-19 (taking in the consideration the different sources) in make a changing in nurses' knowledge and improve their information from updated reports and news

about covid-9, and in addition their role in changing the perceived barriers to infection control of COVID-19 in different direction , however, there are no alteration in this regard to nurse attitude because it was difficult to change nurses attitude in short time and with the use of this variable. These findings were consisted with the study that conducted by Sahar *et al*., (2020). who conducted a survey among Indonesian PHN, revealing that the information sources was the most important component in determining knowledge in this study, and that social media was the first and most important source of COVID-19 awareness, moreover, it was revealed that there was a significantly differences between the participant attitude and the Coronavirus Disease' source of information.

5.5.7. Differences in Nurses Knowledge, Attitudes and Barriers Perceived to Infection Control Regarding COVID-19 with their Nurses' Training Courses:

The findings in table (4-5-7) displays that there are a significant differences in the nurses' perceived barriers to infection control regarding COVID-19 with their nurses' training courses about infection control at *p-value* ≤ 0.05, and there are no-significant differences in nurses' knowledge and attitudes of COVID-19 in related to nurses' training courses about infection control *at p-value* >0.05. The significant differences can be explain that the variations in number of nurses' training courses about infection control that may lead to variations in mean of score related nurses' perceived barriers about infection control regarding COVID-19, that give an idea about how these training courses have an important role in variation of nurses' perceived barriers to infection and how the nurse uses these treating course with these barriers. The none significant differences in nurses' knowledge and attitudes of COVID-19 with nurses' training courses about infection control show that there aren’t any change in the mean of these variables if there was alterations occur in the number

of the nurses' training courses about infection control, this can explain that there aren't any clear benefit of the training courses on these variables.

These finding supported by Almohammed *et al*., (2021), who found in their study in Riyadh, Saudi Arabia. They illustrated that the all HCWs at hospitals also weren't obliged to complete training courses, which mean that there were insignificant different between HCWs training courses about infection control and their knowledge and attitudes. Despite the fact that HCWs who had previously received infection control training had no greater understanding of COVID-19 than those who had not, they were more probable to have a positively attitude concerning COVID-19 and to implement proper standard precautions. In the same regard these findings were unmatched with Chau *et al*.. (2021), who conducted a study in the hospitals and a public health department in Hong Kong, in their study showed that infection prevention training was significantly associated with better knowledge.

5.6. Statistical Correlation between Knowledge, Attitudes and Perceived Barriers to Infection Control Regarding COVID-19 among Nurses:

The results in table (4-6) demonstrate there are highly significant correlation (positive) among nurses' knowledge towards COVID-19 in regard to their attitudes, furthermore there are significant correlation between a nurses' knowledge and perceived barriers of infection control regarding COVID-19 and the in same regard there are significant correlation between nurses' attitudes and perceived barriers of infection control by nurses. These results illustrated more than one domain. The first one: is the positive correlation between nurses' knowledge and their attitude meaning: if there is increase or decrease in knowledge leading to positive or negative in attitudes (same direction), the second domain is the positive correlation between nurses' knowledge and perceived barriers of infection control regarding COVID-19 meaning: if there is increase or

decrease in knowledge leading to increase or decrease in perceived barriers of infection control (same direction), the third and final domain is the positive correlation between nurses' attitude and perceived barriers of infection control regarding COVID-19 meaning: if there is positive or negative change in nurses' attitude leading to increase or decrease in perceived barriers of infection control (same direction).

These results depicted how the correlation among these variables and that can explain the power of the nurses knowledge and how it will correlate with other variables in positive direction in addition , good knowledge lead to good and acceptable level of attitude. These results agreed with Saqlain *et al*., (2020), in their a cross-sectional study in Pakistan, they declared that the participants knowledge was effective shown to be substantially connected to attitude, this showed that HCPs with a positively attitude were more engaged in learning, furthermore they more increased to applied their knowledge into practice. These findings also compatible with the study that conducted by Sahar *et al*., (2020), in a research of Indonesian PHN, the researchers discovered a substantial, positively linear correlations between knowledge-and attitude($r = 0.435$, $p = 0.000$).

Chapter six

Conclusions & Recommendations

Chapter six

Conclusions and Recommendations

6.1.Conclusions:

Based on the finding of the current study and their explanations, the present study achieves that:

6.1.1. Young adults male nurses who have graduated a diploma and work as a nurses from five to ten years, had six to eight month experience in epidemiological wards, used the social media as a sources of information with inadequate nurses training courses.

6.1.2. Nurses have moderate level of knowledge related to general information, poor level of knowledge related to the prevention and have a poor overall knowledge about COVID-19.

6.1.3. Nurses express positive attitudes and high level of barriers towards infection control of COVID-19.

6.1.4. There are a significant differences in nurses' knowledge and: nurses' education level, experience in epidemiological wards and source of nurses' information.

6.1.5. Nurses attitudes have a significant differences regarding: nurses' age, education level and years of experience in nursing.

6.1.6. There are a significant differences in perceived barriers of infection control with: nurses' age, education level, years of experience in nursing, experience in epidemiological wards, source of nurses' and nurses' training courses regarding infection control.

6.1.7. There is highly significant correlation (positive) in nurses' knowledge in regard their attitudes, there is a significant correlation (positive) in nurses' knowledge in relation to their perceived barriers of infection control and there is a significant correlation (positive) in nurses' attitudes towards their perceived barriers of infection control.

6.2. Recommendations:

Based on the results and the conclusion of the current study the researcher suggest the following recommendations:-

6.2.1. Encouraging all the nurses in epidemiological wards to involve in educational courses to raise their level of knowledge regarding general information and attitudes concerning prevention of COVID-19 especially precautions measures to minimizing the barriers of infection control in epidemiological wards concerning COVID-19.

6.2.2. Writing guidelines for precautions measures depending to last updating from WHO and CDC to enhance the prevention and controlling of infections, which should be accessible to all nurses in the epidemiological wards and have to be well-known by all the nursing staff members.

6.2.3. Providing additional supervisions about the obligation to the protective measures especially (hand hygiene, personal protection equipment….) and minimizing the barriers of infection control regarding COVID-19.

6.2.4. Suggesting recommendations to the ministry of health and related authorities to supply the precautionary and preventive measures of COVID-19 to all health facility especially with epidemiological wards.

6.2.5. Working on further studies with large sample from various hospitals on national level to assess nurses' knowledge, attitudes, the barriers to infection control and also their practices concerning prevention and control of COVID-19 and compare it to previous nurses' knowledge, attitudes and the barriers to infection control assessment.

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APPENDICES-A.

ADMINISTRATIVE ARRANGEMENTS

B

Ministry of Higher Education and Scientific Research
وزارة التعليم العالي والبحث العلمي
University of Babylon
College of Nursing
جامعة بابل
كلية التمريض
لجنة الدراسات العليا

العدد : ٧٨٠
التاريخ : ٩ / ٣ / ٢٠٢١ م

Ref. No. :
Date: / /

الى / دائرة صحة بابل / مركز التدريب والتنمية البشرية
م/ تسهيل مهمة

تحية طيبة :

يطيب لنا حسن التواصل معكم ويرجى تفضلكم بتسهيل مهمة طالب الدكتوراه (صادق سلام حسوني مهدي) لغرض جمع عينة دراسة الدكتوراه والخاصة بالبحث الموسوم :

المعارف والاتجاهات والعوائق التي تواجه السيطرة على العدوى فيما يتعلق بكوفيد -١٩ بين الممرضين في مستشفيات الحلة التعليمية

Knowledge , Attitudes and Preceived Barriers to Infection Control Regarding COVID- 19 among Nurses in AL – Hilla Teaching Hospitals

مع الاحترام ...

ا.م.د. حسام عباس داود
معاون العميد للشؤون العلمية والدراسات العليا
٩ / ٣ / ٢٠٢١

صورة عنه الى //
- مكتب السيد العميد للتفضل بالاطلاع مع الاحترام .
- لجنة الدراسات العليا
- الصادرة .

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C

جمهورية العـــراق

وزارة الصحة والبيئة دائرة صحة محافظة بابـــــل المديـــر العـــام مركـــز التدريب والتنمية البشرية لجنة البحوث		Ministry Of Health Babylon Health Directorate Email:- Babel_Healthmoh@yahoo.com Tel:282628 or 282621

استمارة رقم :- ٨
رقم القرار :- ١٢
تاريخ القرار :- ٦/٦/ ٢٠٢١

وزارة الصحة
دائرة صحة بابل
مركز التدريب والتنمية البشرية

قرار لجنة البحوث

تحية طيبة ...

درست لجنة البحوث في دائرة صحة بابل مشروع البحث ذي الرقم (٨) المعنونة (المعارف والاتجاهات والعوائق التي تواجه السيطرة على العدوى فيما يتعلق بكوفيد – ١٩ بين الممرضين في مستشفيات الحلة التعليمي) والمقدم من الباحث (صادق سلام حسوني) إلى وحدة أدارة البحوث والمعرفي مركز التدريب والتنمية البشرية في دائرة صحة بابل بتاريخ ٢٠٢١/٥/٢٥ وقررت :
قبول مشروع البحث أعلاه كونه مستوفيا للمعايير المعتمدة في وزارة الصحة والخاصة بتنفيذ البحوث ولا مانع من تنفيذه في مؤسسات الدائرة .

مـــــع الاحتـــــرام

الدكتور / محمد عبد الله عجرش
رئيس لجنة البحوث
/ / ٢٠٢١

نسخة منه إلى :
- مكتب المدير العام / مركز التدريب والتنمية البشرية / وحدة إدارة البحوث ... مع الأوليات.

سوزان

D

جمهورية العراق

Ministry Of Health Babylon Health Directorate Email:- Babel_Healthmoh@yahoo.com Tel:282628 or 282621		وزارة الصحة والبيئة دائرة صحة محافظة بابـــل المديـــر العـــام مركـــز التدريب والتنمية البشرية وحدة أدارة البحوث العدد : ٢٦٠ التاريخ: ٤ / ٢ / ٢٠٢١

إلى / مستشفى مرجان التعليمي
مستشفى الحلة التعليمي

وزارة الصحة
دائرة صحة بابل
مركز التدريب والتنمية البشرية

/ تسهيل مهمة

تحية طيبة ...

أشارة إلى كتاب جامعة بابل / كلية التمريض / لجنة الدراسات العليا ذي العدد ٧٢٠ في ٩/٣/ ٢٠٢١

نرفق لكم ربطا استمارات الموافقة المبدئية لمشروع البحث العائد للباحث طالب الدراسات العليا دكتوراه (صادق سلام حسوني مهدي) .

للتفضل بالاطلاع وتسهيل مهمة الموما أليها 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
/ / ٢٠٢١

مستشفى مرجان
للأمراض الباطنية والقلبية التخصصي
(الواردة)
العدد :
التاريخ ٤ / ٢ / ٢٠٢١

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

E

جمهورية العراق

Ministry Of Health Babylon Health Directorate Email:- Babel_Healthmoh@yahoo.com Tel:282628 or 282621		وزارة الصحة والبيئة دائرة صحة محافظة بابـــل المديـــر العـــام مركـــز التدريب والتنمية البشرية وحدة أدارة البحوث العدد : ٢٦٠ التاريخ: ٩ / ٢ /٢٠٢١

٢٧١٧
٢٠٢١/٢/١١

إلى / مستشفى مرجان التعليمي
مستشفى الحلة التعليمي

وزارة الصحة
دائرة صحة بابل
مركز التدريب والتنمية البشرية

/ تسهيل مهمة

تحية طيبة ...

أشارة إلى كتاب جامعة بابل / كلية التمريض / لجنة الدراسات العليا ذي العدد ٧٢٠ في ٢٠٢١/٣/٩

نرفق لكم ربطا استمارات الموافقة المبدئية لمشروع البحث العائد للباحث طالب الدراسات العليا دكتوراه (صادق سلام حسوني مهدي) .

للتفضل بالاطلاع وتسهيل مهمة الموما أليها 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

الصيدلاني
أكرم طالب كريم

الدكتور
محمد عبد الله عجرش
مدير مركز التدريب والتنمية البشرية
/ /٢٠٢١

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

Appendices-B.

sampling size

G

415	ادخل حجم المجتمع N في الخلية المقابلة			
199.7424075	= فيكون حجم العينة			
0.05	1.96	3.8416		
0.0025	0.5			
$n=\frac{N\times p(1-p)}{\left[\left[N-1\times\left(d^2\div z^2\right)\right]+p(1-p)\right]}$		**معادلة ستيفن ثامبسون**		
N	**حجم المجتمع**			
z	الدرجة المعيارية المقابلة لمستوى الدلالة ٠,٩٥ وتساوي ١,٩٦			
d	نسبة الخطأ وتساوي ٠,٠٥			
p	نسبة توفر الخاصية والمحايدة = ٠,٥٠			

Appendices-C. Questionnaire

استمارة استبيان

عزيزي الممرض / عزيزتي الممرضة

تحية طيبة وبعد، سنقوم من خلال هذه الاستمارة بعمل دراسة عن :

" المعارف والاتجاهات والعوائق التي تواجه السيطرة على العدوى فيما يتعلق بكوفيد- 19 بين الممرضين في مستشفيات الحلة التعليمية. "

وعليه وقع الاختيار عليكم لتكونوا من ضمن المشمولين في الدراسة وإذا كنتم موافقون على المشاركة في هذه الدراسة الاساسية فنرجو تعبئة الاستمارة المرفقة والتوقيع على هذه الرسالة علما بأن المعلومات ستبقى سرية لدينا.

Knowledge, Attitudes and Perceived Barriers to Infection Control Regarding COVID-19 Among Nurses in Al-Hilla Teaching Hospitals.

المعارف والاتجاهات والعوائق التي تواجه السيطرة على العدوى فيما يتعلق بكوفيد- 19بين الممرضين في مستشفيات الحلة التعليمية.

Objectives:

The study objected to:

1. Assess knowledge regarding COVID-19 among nurses.
2. Assess attitudes regarding COVID-19 among nurses.
3. Identify the barriers to infection control perceived by nurses regarding COVID-19.

4. Find out the differences in nurses' knowledge attitudes and perceived barriers of infection control of COVID-19 with regards their selected demographic variables (age, educational level, years of employment in nursing, experiences in epidemic units, sources of information COVID-19 and training courses related to infection control) .

5. Find out the correlation between knowledge and attitudes and the barriers to infection control perceived by nurses.

الأهداف:

الدراسة تهدف إلى :

1- تقييم المعارف حول كوفيد-19 بين الممرضين.
2- تقييم الاتجاهات حول كوفيد-19 بين الممرضين.
3- تحديد عوائق السيطرة على العدوى التي تواجه الممرضين حول كوفيد-19.
4- معرفة الاختلافات بين المعارف و الاتجاهات وعوائق السيطرة على العدوى التي تواجه الممرضين مع المتغيرات الديموغرافية المختارة (العمر ، المستوى التعليمي ، سنوات العمل في

التمريض ، الخبرات في الوحدات الوبائية, مصدر المعلومات حول كوفيد-19 والدورات التدريبية المتعلقة بالسيطرة على العدوى).

5- معرفة الارتباط بين المعارف و الاتجاهات وعوائق السيطرة على العدوى التي تواجه الممرضين.

Part one : Demographic characteristics of the study Sample

1. Age, ☐
2. Gender : Male ☐
   Female ☐

3. Educational level :
   - Graduate of the primary school of nursing ☐
   - Graduate of the nursing school ☐
   - Graduate of the diploma in nursing ☐
   - Graduate of the bachelor in nursing and above ☐

4. Years of employment in nursing ☐
5. The experience in epidemic units ☐ month
6. What are the source of your information about COVID-19 ?
   - The internet: social media sites ☐
   - The internet: Scientific websites ☐
   - Library ☐
   - Colleagues (nurses) ☐
7. Training course about infection control yes, ☐ ☐
   number of courses ☐

Part two: Nurses' Knowledge About COVID-19

I- General information regarding COVID-19

1. COVID-19 is….

☐ A bacterial infection

☐ A viral infection

☐ A fungal infection

☐ A protozoal infection

2. **The incubation period of the COVID-19 is…**

☐ 2 to 14 days

☐ 2 to 11 days

☐ 2 to 21 days

☐ 7 to 21 days

3. **The mode of transmission for COVID-19 is…**

☐ Respiratory droplet

☐ Direct (infected person) & Indirect Contact (surface, objects such as thermometer)

☐ Airborne Transmission (Aerosol)

☐ All

4. **The main symptom of COVID-19 is …**

☐ High-Grade Fever

☐ Dry Cough

☐ Shortness of Breath

☐ All

5. **Confirmatory diagnosis for COVID-19 is …**

☐ Rapid Diagnostic Test (RTD)

☐ Reverse Transcription – Polymerase Chain Reaction (RT-PCR)

☐ Chest Computed Tomography (CT) Scan

☐ All

6. **The high-risk population of COVID-19 for the severe outcome is …**

☐ Children

☐ Pregnant Women

☐ Elderly (over 65years) & People with underlying medical conditions such as; Diabetes, Heart disease, Kidney disease, Asthma, Cancer, etc.

☐ All

7. **The therapeutic management option for COVID-19 is …**

☐ Supportive & Symptomatic Management

☐ Rehabilitative

☐ Palliative Care

☐ Anti-viral Therapy

8. **Complications of COVID-19 is …**

☐ ARDS

☐ Shock

☐ Organ dysfunctions (Acute Kidney Injury, Acute Lung Injury, Acute Liver Injury, Acute Cardiac Injury, etc.)

☐ All

9. The mortality rate of COVID-19 is…

☐ 0.5 to 3%

☐ 9.5%

☐ 34.4%

☐ 39%

10. The virus causing the COVID-19 is…

☐ SARS-CoV

☐ MERS-CoV

☐ SARS-CoV-2

☐ Ebola Virus

II- Prevention of COVID-19

1. Preventive measures for COVID-19 infection is ...

☐ Hand-washing with soap & water

☐ Social distancing and isolation of suspected & confirmed cases

☐ Wearing of Personal Protective Equipment (PPE) while caring for infected patients

☐ All

2. An action that helps in prevention of COVID-19 is…

☐ Washing hands vigorously with (soap/water) for 20 second.

☐ Washing hands with water for 20 second.

☐ None of above

☐ All

3. The COVID-19 transmitted through …

☐ Pets to people

☐ Person-to-person

☐ Eating raw meat

☐ All

N

4. **The ways that prevent the spread of COVID-19 include…**

☐ Stay away from people who are sick

☐ Stay home if you get sick

☐ Follow good hygiene practices

☐ All of the above

5. **For COVID-19, the period of quarantine is ____ from the last date of exposure, because this is the longest incubation period (the span of time during which people have developed illness after exposure).**

☐ 5 days.

☐ 7 days.

☐ 14 days.

☐ 21 days.

6. **Wearing a mask is important for prevent the transmission of disease whenever being the Individual commitment to the following principles...**

☐ Everyone 2 and older wearing masks in public.

☐ Wash your hands or use hand sanitizer before putting on your mask.

☐ Wear your mask over your nose and mouth and secure it under your chin .

☐ All

7. **---------- An Important Ways to Slow the Spread of COVID-19.**

☐ Stay at least 6 feet (about 2 arm lengths) from others who don't live with you.

☐ Avoid crowds. The more people you are in contact with, the more likely you are to be exposed to COVID-19

☐ All the above

☐ None of above

8. **Cover the mouth and the nose through coughing and sneezing is important for prevent the transmission of COVID-19 when you are commitment the following rule…**

☐ Always cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow and do not spit.

☐ Throw used tissues in the trash.

☐ Immediately wash your hands with soap and water for at least 20 seconds. If soap and water are not readily available, clean your hands with a hand sanitizer that contains at least 60% alcohol.

☐ All

O

Part three: Nurses' Attitudes About COVID-19

N.	Items	Agree	Neutral	Disagree
1	Do you agree that COVID-19 will finally be successfully controlled?			
2	Do you have confidence that Iraq can win the battle against the COVID-19 virus?			
3	I believe that an asymptomatic patient can transmit the virus to others			
4	I am always worried about transmitting the virus to my family, friends & society.			
5	If getting COVID-19, you will accept isolation in health facilities..			
6	Transmission of COVID-19 can be prevented by washing hands with soap frequently..			
7	Prevalence of COVID-19 can be reduced by the active participation of health- care workers in hospital infection control programs..			
8	If a COVID-19 vaccine was available, I would have it..			
9	The patients with COVID-19 should be kept in isolation..			
10	Medical staff are ready to participate in anti-epidemic procedures in the Iraq community.			

Part four: Perceived barriers to infection control practice regarding COVID-19

N.	Items	Agree	Neutral	Disagree
1	Lack of knowledge about the mode of transmission of the disease COVID-19.			
2	Not commitment to wearing personal protective equipment while examine or contact with the patient.			
3	Limitation of infection control materials.			
4	Not commitment to hand washing after examine or contact with the patient.			
5	Lack of policy and Procedures of infection control Practice.			
6	Insufficient training in infection control measurements.			
7	Less commitment of health care workers to the infection control policies?			
8	There are no clear technical or management instructions for handling COVID-19 patients.			
9	Overcrowding of the emergency room and overload number of patients in hospital more than its limit capacity,.			

P

الجزء الأول: الخصائص الديموغرافية لعينة الدراسة

1. **العمر:** ☐

2. **الجنس:**

ذكر ☐

أنثى ☐

3. **المستوى التعليمي:**

خريج دورات تدريبية في التمريض ☐

خريج إعدادية التمريض ☐

خريج دبلوم في التمريض ☐

خريج بكالوريوس في التمريض وما فوق ☐

4. سنوات العمل في التمريض: ☐

5. **مدة خدمتك في الوحدات الوبائية** ☐ **شهر**

6. **ما هو مصدر معلوماتك حول كوفيد-19؟**

- **الإنترنت: مواقع التواصل الاجتماعي** ☐
- **الإنترنت: مواقع علمية** ☐
- **مكتبة** ☐
- **الزملاء (الممرضين)** ☐

7. **دورة تدريبية في السيطرة على العدوى** **نعم** ☐ **لا** ☐

عدد الدورات ☐

الجزء الثاني: معارف الممرضين حول كوفيد-19

I - معلومات عامة بخصوص كوفيد-19

1. كوفيد-19هو....

- ☐ عدوى بكتيرية
- ☐ عدوى فيروسية
- ☐ عدوى فطرية
- ☐ عدوى فطرية

2. فترة حضانة كوفيد-19 هي ...

- ☐ من 2 إلى 14 يومًا

Q

- من 2 إلى 11 يومًا
- من 2 إلى 21 يومًا
- من 7 إلى 21 يومًا

3. طريقة انتقال كوفيد-19هي ...

- القطيرات التنفسية
- الاتصال المباشر (الشخص المصاب) والاتصال غير المباشر (السطح ، الأشياء مثل مقياس الحرارة)
- الانتقال عن طريق الهواء (الهباء الجوي)
- الكل

4. العرض الرئيسي لـ كوفيد-19هو ...

- حمى شديدة
- سعال جاف
- ضيق في التنفس
- الكل

5. **التشخيص التأكيدي لـ كوفيد-19هو** ...

- اختبار التشخيص السريع (RTD)
- النسخ العكسي - تفاعل البوليميراز المتسلسل (RT-PCR)
- التصوير المقطعي للصدر (CT)
- الكل

6. **السكان المعرضون لخطر الإصابة بـ كوفيد-19 للنتيجة الشديدة هم ...**

- أطفال
- النساء الحوامل
- كبار السن (أكثر من 65 عامًا) والأشخاص الذين يعانون من حالات طبية أساسية مثل ؛ مرض السكري ، أمراض القلب ، أمراض الكلى ، الربو ، السرطان ، إلخ.
- الكل

7. خيار إدارة كوفيد-19 هو ...

- الدعم وادارة الأعراض
- إدارة إعادة التأهيل
- العناية التلطيفية
- العلاج المضاد للفيروسات

8. مضاعفات كوفيد-19هي ...

- متلازمة الضائقة التنفسية الحادة
- الصدمة
- اختلال وظائف الأعضاء (إصابات الكلى الحادة ، إصابة الرئة الحادة ، إصابة الكبد الحادة ، إصابة القلب الحادة ، إلخ)
- الكل

9. معدل وفيات كوفيد-19هو ...

- 0.5 إلى 3٪
- 9.5٪
- 34.4٪

R

- ☐ ٪39

10. الفيروس المسبب لـ كوفيد-19 هو ...

- ☐ فيروس السارس
- ☐ ميرس-CoV
- ☐ السارس- CoV-2
- ☐ فيروس الإيبولا

II - الوقاية من كوفيد-19

1. التدابير الوقائية لعدوى كوفيد-19هي ...

- ☐ غسل اليدين بالماء والصابون
- ☐ التباعد الاجتماعي وعزل الحالات المشتبه بها والمؤكدة
- ☐ ارتداء معدات الحماية الشخصية (PPE) أثناء رعاية المرضى المصابين
- ☐ الكل

2. إجراء يساعد في الوقاية و انتقال كوفيد-19...

- ☐ غسل اليدين بقوة بماء (الصابون / الماء) لمدة 20 ثانية.
- ☐ غسل اليدين بالماء لمدة 20 ثانية.
- ☐ لا شيء مما سبق
- ☐ الكل

3. كوفيد-19 ينتقل من خلال ...

- ☐ الحيوانات الأليفة إلى الناس
- ☐ من شخص لآخر
- ☐ أكل اللحوم النيئة
- ☐ الكل

4. الطرق التي تمنع انتشار كوفيد-19تشمل..

- ☐ الابتعاد عن الأشخاص المرضى
- ☐ البقاء في المنزل إذا حصلت على المرض
- ☐ اتبع ممارسات النظافة الجيدة
- ☐ كل ما سبق

5. بالنسبة لـ كوفيد-19، فإن فترة الحجر الصحي هي _____ من آخر تاريخ للتعرض ، لأن هذه هي أطول فترة حضانة (الفترة الزمنية التي أصيب خلالها الأشخاص بالمرض بعد التعرض).

- ☐ 5 أيام.
- ☐ 7 أيام.
- ☐ 14 يوم.
- ☐ 21 يوم.

6. ارتداء الكمامة يصبح مهما لمنع انتقال كوفيد-19كلما كان التزام الفرد بالمبادئ التالية...

- ☐ كل من يبلغ من العمر عامين وأكبر يرتدي أقنعة في الأماكن العامة.
- ☐ اغسل يديك أو استخدم معقم اليدين قبل وضع القناع.

S

- ☐ ضع قناعك على أنفك وفمك وثبته تحت ذقنك.
- ☐ الكل

8. ----------من الطرق المهمة لإبطاء انتشار كوفيد-19.

- ☐ ابق على الأقل 6 أقدام (حوالي 2 ذراع) من الآخرين الذين لا يعيشون معك.
- ☐ تجنب الحشود. كلما زاد عدد الأشخاص الذين تتواصل معهم ، زاد احتمال تعرضك لـ كوفيد-19
- ☐ كل ما سبق
- ☐ لا شيء مما سبق

8. تغطية السعال والعطس مهم لمنع انتقال كوفيد-19عند القيام بالقاعدة التالية...

- ☐ قم دائمًا بتغطية فمك وأنفك بمنديل ورقي عند السعال أو العطس أو استخدام الجزء الداخلي من مرفقك ولا تبصق.
- ☐ رمي المناديل المستعملة في سلة المهملات.
- ☐ اغسل يديك فورًا بالماء والصابون لمدة 20 ثانية على الأقل. إذا لم يتوافر الماء والصابون بسهولة ، نظف يديك بمطهر لليدين يحتوي على 60٪ كحول على الأقل.
- ☐ الكل

الجزء الثالث: اتجاهات الممرضين حول كوفيد-19

ت	الاسئلة	موافق	محايد	غير موافق
1	هل توافق على أنه سيتم في نهاية المطاف السيطرة على مرض كوفيد-19 بنجاح..			
2	هل لديك ثقة في أن العراق يمكن أن ينتصر في المعركة ضد كوفيد-19...			
3	أعتقد أن المريض بدون أعراض يمكن أن ينقل الفيروس إلى الآخرين.			
4	أنا قلق دائما حول نقل الفيروس إلى عائلتي وأصدقائي والمجتمع.			
5	في حالة الإصابة بـ كوفيد-19 ، ستقبل العزل في المرافق الصحية..			
6	يمكن منع انتقال كوفيد-19 عن طريق غسل اليدين بالصابون بشكل متكرر ..			
7	يمكن الحد من انتشار كوفيد-19 من خلال المشاركة النشطة للعاملين في مجال الرعاية الصحية في برامج مكافحة العدوى بالمستشفيات.			
8	إذا كان لقاح كوفيد-19 متاحًا ، فسأحصل عليه ..			
9	المرضى الذين يعانون من كوفيد-19 ينبغي ان يبقون في العزل الصحي..			
10	الطاقم الطبي جاهز للمشاركة في إجراءات مكافحة الوباء في المجتمع العراقي.			

T

الجزء الرابع : العوائق التي تواجه السيطرة على العدوى فيما يتعلق بكوفيد-19

ت	الاسئلة	موافق	محايد	غير موافق
1	نقص المعرفة حول طريقة انتقال مرض كوفيد -19			
2	عدم ارتداء معدات الوقاية الشخصية أثناء الفحص أو الاتصال بالمريض.			
3	النقص في مواد السيطرة على العدوى			
4	عدم غسل اليدين بعد الفحص أو ملامسة المريض			
5	عدم وجود سياسة وإجراءات ممارسة السيطرة على العدوى			
6	التدريب غير الكافي حول تدابير السيطرة على العدوى			
7	قلة التزام العاملين في مجال الرعاية الصحية بسياسات السيطرة على العدوى			
8	لا توجد تعليمات فنية أو إدارية واضحة للتعامل مع مرضى كوفيد -19.			
9	يخفي المرضى تاريخ سفرهم ، مما يجعل الفحص غير دقيق.			

U

Sadiq Salam <sadiq.salam@altoosi.edu.iq> 4 ديسمبر 2020 في 3:50 م
إلى: msaqlain@bs.qau.edu.pk

Dear Mr. M. Saqlain
I hope you are feeling well,

Just to let you know that I am sadiq salam PhD student in adult nursing, university of babylon,iraq.I would like to use your questionnaire of your research" Knowledge, attitude, practice and perceived barriers among healthcare workers regarding COVID-19: a crosssectional survey from Pakistan" as apart in my dissertation, i hope send to me the questionnaire and its scoring system and i would be grateful for that.

Kind regards,

Muhammad Saqlain <msaqlain@bs.qau.edu.pk> 6 ديسمبر 2020 في 11:05 ص
إلى: Sadiq Salam <sadiq.salam@altoosi.edu.iq>

Dear Sadiq.
Kindly find the attached questionnaire with permission of its use in your research.

Best of Luck for your research.

Thanks

[النص المقتبس مخفي]

--

Best Regards

Muhammad Saqlain
M.Phil. Pharmacy Practice {Quaid i Azam University Islamabad}
Pharm-D. RPH.
Mobile: +92308-7134445

Supplementary file 1.pdf
282K

Permission granted

١ رسالة

Danielle SAADEH <daniellesaadeh@hotmail.com> الاثنين، ١٦ أغسطس ٢٠٢١ في ٣:٢١ م

إلى: Sadiq Salam <sadiq.salam@altoosi.edu.iq>

Greetings,

Thank you for your interest in our study. You have the permission to use it for your research topic. You can get all the questions used in the questionnaire to assess knowledge, attitudes and practices of nurses towards COVID-19 from our open access published article that you can found on https://pubmed.ncbi.nlm.nih.gov/33135217/

In fact, this study is part of a big research project that it is still ongoing and we are still working on the validity and reliability for this newly created tool to validate it among the Lebanese population.

However, I can share with you our Cronbach's Alpha values (data unpublished yet) for the knowledge, attitude and practice scores that we have calculated on a limited sample size:

	Cronbach alpha
Knowledge score	0.672
Attitude score	0.778
Practice score	0.830

As per the scoring methods, you can find them in the published article in the methods section.

Good luck and best regards,

--

Danielle SAADEH, RN, BSN, MPH, PhD
Associate Professor of Epidemiology
Lebanese University
Beirut, Lebanon

APPENDICES-D-

Table of experts

Table of experts

Table of Experts

ت	اسم الخبير	اللقب العلمي	الاختصاص	سنين الخبرة	مكان العمل
1	د. كافي محمد ناصر	استاذ	تمريض صحة الأسرة والمجتمع	40	كلية الشيخ الطوسي
2	د. سلمى كاظم جهاد	استاذ	تمريض صحة الأسرة والمجتمع	36	جامعة بابل / كلية التمريض
3	د. راجحة عبد الحسن	استاذ	تمريض بالغين	36	جامعة الكوفة / كلية التمريض
4	د. امين عجيل الياسري	استاذ	تمريض صحة الأسرة والمجتمع	35	جامعة بابل/ كلية التمريض
5	د. حسين هادي عطية	استاذ	تمريض بالغين	35	جامعة بغداد / كلية التمريض
6	د. صباح عباس احمد	استاذ	تمريض بالغين	34	جامعة بغداد / كلية التمريض
7	د. حكيمة شاكر حسن	استاذ	تمريض بالغين	33	جامعة بغداد / كلية التمريض
8	د. فاطمة وناس خضير	استاذ	تمريض صحة الأسرة والمجتمع	30	جامعة الكوفة / كلية التمريض
9	د. حسين جاسم محمد	استاذ	تمريض صحة الأسرة والمجتمع	29	جامعة بابل / كلية التمريض
10	د. ضرغام مجيد حميد	استاذ	تمريض بالغين	24	جامعة المثنى / كلية التمريض
11	د. خالدة محمد حضر	استاذ	تمريض بالغين	19	جامعة بغداد / كلية التمريض
12	د. وسام جبار قاسم	استاذ مساعد	تمريض صحة الأسرة والمجتمع	25	جامعة بغداد / كلية التمريض
13	د. ابراهيم علوان كاظم	استاذ مساعد	تمريض بالغين	15	جامعة الكوفة / كلية التمريض
14	د. صادق عبد الحسين حسن	استاذ مساعد	تمريض بالغين	10	جامعة بغداد / كلية التمريض
15	د. هاشم جبار صدام	استاذ مساعد	اللغة العربية	11	كلية الشيخ الطوسي

APPENDICES-E-

Approval of the Linguistic Expert

Approval of the Linguistic Expert

Z

إقــرار الخبيــر اللغــوي

أقر بأن الأطروحة الموسومة:

(Knowledge, Attitudes and Perceived Barriers to Infection Control Regarding COVID-19 Among Nurses in Al-Hilla Teaching Hospitals)

قــد جــرى مراجعتهــا مــن الناحيــة اللغويــة وأصــبحت بأســلوب علمــي ســليم خـــــال مـــن الأخطـــاء اللغويـــــة ولأجلـــه وقعـــــت.

الخبيـر اللـغـوي

م.م. نعيمة جاسم عباس

جـامـعـة بـابل/ كـلـيـة الـتـربية الاساسية

قسم اللغة الإنكليزية

11 /9/ 2022

AA

Ministry of Higher Education and Scientific Research
University of Babylon
college of Basic Education

وزارة التعليم العالي والبحث العلمي
جامعة بابل
كلية التربية الاساسية

Ref. No.:
Date: / /

العدد : ٢٤٢ / ٢
التاريخ: ١١ / ٤ / ٢٠٢٢

جامعة بابل / كلية التمريض
الصـــــــادرة
العدد / ١٠٤ -
التاريخ ١١ / ٤ / ٢٠٢٢

كلية التربية الاساسية
شعبة الموارد البشرية
الصادرة

الى/ جامعة بابل/ كلية التمريض _ وحدة الدراسات العليا

م/ تقويم لغوي

نهديكم أطيب التحيات ...

كتابكم ذو العدد١٣٦٥ في ٢٠٢٢/٣/٢٧، نعيد اليكم اطروحة طالب الدراسات العليا/ الدكتوراه (**صادق سلام حسوني**) والموسومة بـ (المعارف والاتجاهات والعوائق التي تواجه السيطرة على العدوى فيما يتعلق بكوفيد – 19 بين الممرضين في مستشفيات الحله التعليمية) بعد تقويمها لغوياً واسلوبياً من (**م.م. نعيمة جاسم عباس**) وهي صالحة للمناقشة بعد الاخذ بالملاحظات المثبتة على متنها.

للتفضل بالتسلم ... مع الاحترام

المرافقات //

- اطروحة دكتوراه.
- إقرار المقوم اللغوي.

أ.د.فراس سليم حياوي
معاون العميد للشؤون العلمية
٢٠٢٢/٤/١١

نسخة منه الى //

- مكتب السيد العميد المحترم ...للتفضل بالاطلاع مع الاحترام.
- م .م. نعيمة جاسم... للعلم لطفاً.
- الشؤون العلمية
- الصادرة

ذكرى

العراق - بابل - جامعة بابل
بدالة الجامعة ٠٠٩٦٤٧٢٣٠٠٣٥٧٤٤
مكتب العميد ١١٨٤
المعاون العلمي ١١٨٨
المعاون الاداري ١١٨٩
وطني ٠٧٢٣٠٠٣٥٧٤٤
امنية ٠٧٦٠١٢٨٨٥٦٦
basic@uobabylon.edu.iq

الخلاصة

خلفية الموضوع: جائحة كوفيد-19 هي أزمة صحية كبيرة ظهرت في نهاية الربع الأول من القرن الواحد والعشرين والتي غيرت حياة الملايين من الناس على مستوى العالم.

الأهداف: الغرض من الدراسة هو تقييم معارف الممرضين واتجاهاتهم المتعلقة بـ كوفيد-19 وتحديد العوائق التي تحول دون السيطرة على العدوى التي تواجه الممرضين فيما يتعلق بـ كوفيد-19، بالإضافة إلى معرفة الاختلافات بين المعارف و الاتجاهات وعوائق السيطرة على العدوى التي تواجه الممرضين مع المتغيرات الديموغرافية. علاوة على ذلك ، إيجاد الارتباط بين المعارف و الاتجاهات وعوائق السيطرة على العدوى التي تواجه الممرضين.

المنهجية: أجريت دراسة مقطعية وصفية في مستشفيات الحلة التعليمية في مدينة الحلة من (25 ايلول 2020) إلى (15 اذار 2022). تم اختيار عينة ملائمة (غير احتمالية) من 200 ممرض يعملون في تلك المستشفيات.

النتائج: أظهرت نتيجة الدراسة أن اكثر من نصف الممرضين (58٪) لديهم معرفة ضعيفة فيما يتعلق بـ كوفيد-19، وأغلب الممرضين (86٪) أظهروا توجها إيجابيا، ومعظم الممرضين (74.5٪) واجهوا مستوى عالٍ من العوائق التي تحول دون السيطرة على العدوى فيما يتعلق بكوفيد-19. كان هناك ارتباط كبير (إيجابي) بين معرفة الممرضين واتجاهاتهم فيما يتعلق كوفيد-19، علاوة على ذلك بين معرفة الممرضين وبين العوائق التي تواجههم للسيطرة على العدوى فيما يتعلق بـ كوفيد-19, وفي نفس الصدد العلاقة بين اتجاهات الممرضين العوائق التي تواجههم للسيطرة على العدوى.

الاستنتاجات: كانت معرفة الممرضين ضعيفة ، وعبروا عن اتجاهات ايجابيه ومستوى عالي من العوائق التي تواجههم للسيطرة على العدوى فيما يتعلق بـ كوفيد-19.

التوصيات: تشجيع جميع الممرضين في الردهات الوبائية على المشاركة في الدورات التعليمية لرفع مستوى معرفتهم فيما يتعلق بالمعلومات العامة والمبادئ الرئيسية المتعلقة بـ كوفيد-19.

جمهورية العراق
وزارة التعليم العالي والبحـث العلمـي
جامعـة بابـــــل
كليــة التمريـض

المعارف والاتجاهات والعوائق التي تواجه السيطرة على العدوى فيما يتعلق بكوفيد- 19 بين الممرضين في مستشفيات الحلة التعليمية

اطروحة مقدمة الـــى
مجلـــــس كليـــــة التمريـــض, جامعة بابل

من قبل الطالب
صادق سلام حسوني مهدي

كجزء من متطلبات نيل درجة الدكتوراة فلسفة في علوم التمريض

بإشـــــــراف

الأستـــــــاذ الدكتورة فخرية جبر محيبس

اذار /2022ميلادي **شعبان /1443هجري**