



Çankırı Karatekin University
Graduate School of Health Sciences



Master of Science Thesis

**ASSESSMENT THE NURSES KNOWLEDGE AND PREVENTIVE
BEHAVIORS ABOUT SPREAD OF COVID-19 AT AL HUSSEIN
HOSPITAL IN AL NASIRIYA CITY**

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BY

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The Department of Public Health Nursing**

The Degree of Master of Science

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Çankırı 2023

ACCEPTANCE AND APPROVAL

Shaymaa Odhaib Hussein, the graduate student of The Institute of Health Sciences with the student number of 208205257, has successfully presented her thesis entitled “Assessment the Nurses Knowledge and preventive behaviors about Spread of COVID-19 at Al Hussein Hospital in Al Nasiriya City” before the jury whose signatures are below, after fulfilling all of the requirements determined by the relevant regulations for the degree of Master of Science:

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ETHICS STATEMENT

The thesis, entitled “Assessment of the Nurses’ Knowledge and preventive behaviors about Spread of COVID-19 at Al Hussein Hospital in Al Nasiriya City,” which was prepared and presented as a thesis, was written by myself in accordance with scientific, academic, and ethical rules. The idea/hypothesis of my thesis solely belong to my supervisor and to me. The research pertaining to the thesis was conducted by myself, and therefore, all of the used sentences and interpretations within the work belong to me.

I declare the aforementioned issues to be correct.

Signature

2023 /26/ 01

Shaymaa Odhaib Hussein HUSSEIN

ABSTRACT

ASSESSMENT THE NURSES KNOWLEDGE AND PREVENTIVE BEHAVIORS ABOUT SPREAD OF COVID-19 AT AL HUSSEIN HOSPITAL IN AL NASIRIYA CITY

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Master of Science in Nursing

Advisor: Asst. Prof. Dr. Ceyhun TÜRKMEN

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Background: The COVID-19 infection has been a disease that has caused a crisis in both society and the health system due to its very high transmission rate and severe symptoms such as severe respiratory failure. **Objectives:** The study aims to assess the nurses' knowledge and preventive behaviors about the spread of COVID-19. **Methods:** A descriptive cross-sectional study has been carried out at Al Hussein Hospital in Al Nasiriya City among 150 nurses chosen by using non-probability sampling (a convenience sample). **Results:** The study found that 106 (70.7%) of nurses are female, 111 (74%) are between the ages of 20 and 29, 74 (49.3%) have a diploma in nursing and 112 (74.7%) have 1-5 years of experience. The mean of the clinical presentation of COVID-19 is 7.50, the transmission route is 5.36, prevention and control are 8.95, the overall knowledge about the spread of COVID-19 is 21.8, and the preventive behavior about COVID-19 is 32.74. There is a significant relationship between nurses' knowledge about the spread of COVID-19 and age, level of education, and years of service at p-values of 0.002, 0.047, and 0.020, respectively. **Conclusion:** The study concluded that nurses have good knowledge and preventive behavior about the spread of COVID-19. **Recommendation:** Educational lectures on the COVID-19 chain of infection should be given, training sessions should be held to teach nurses how to use personal protective equipment, and regular supervision of nursing staff should be evaluated on the practice of handwashing, masks, gloves and other personal protective equipment.

2023, 58 pages

Keywords: Assessment, COVID-19, Nurses, Knowledge, Preventive behaviors, Spread,

ÖZET

HEMŞİRELERİN AL NASİRİYA ŞEHRİNDEKİ AL HUSSEİN HASTANESİNDE COVID 19'UN YAYILMASI HAKKINDA BİLGİ VE ÖNLEYİCİ DAVRANIŞLARININ DEĞERLENDİRİLMESİ

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Ocak 2023

Arka plan: COVID-19 enfeksiyonu, çok yüksek bulaşma oranı ve ciddi solunum yetmezliği gibi ciddi semptomları nedeniyle hem toplumda hem de sağlık sisteminde krizlere neden olan bir hastalık olmuştur. **Amaç:** Araştırma hemşirelerin COVID-19'un yayılmasına ilişkin bilgi ve önleyici davranışlarını değerlendirmeyi amaçlamaktadır. **Yöntemler:** Al Nasiriya kentindeki Al Hussein hastanesinde, olasılıksız örnekleme (kolaylıkla bulunabileni örnekleme) kullanılarak seçilen 150 hemşire arasında tanımlayıcı kesitsel bir çalışma yapılmıştır. **Bulgular:** Araştırma sonucunda hemşirelerin 106'sının (%70,7) kadın, hemşirelerin 111'inin (%74) (20-29) yaşında olduğu, hemşirelerin 74'ünün (%49,3) lisans düzeyinde hemşirelik diplomasına sahip olduğu ve 112'sinin (%74,7 1-5 yıl mesleki tecrübesi olduğu belirlendi. COVID-19'un klinik prezentasyon ortalaması (7.50), bulaşma yolu (5.36), önleme ve kontrol (8.95), COVID-19'un yayılması hakkında genel bilgi (21.8), COVID-19 ile ilgili önleyici davranış ortalamasıdır. (32.74). Hemşirelerin COVID-19'un yayılması hakkındaki bilgileri ile yaş, eğitim düzeyi ve hizmet yılı arasında (sırasıyla $p= 0,002$, $0,047$ ve $0,020$) anlamlı bir ilişki vardır. **Sonuç:** Araştırma bulguları, hemşirelerin COVID-19'un yayılması konusunda iyi bilgi ve önleyici davranışa sahip olduğu sonucuna varmıştır. **Öneri:** COVID-19 enfeksiyon zinciri hakkında eğitici dersler verilmeli, hemşirelere kişisel koruyucu ekipmanların nasıl kullanılacağını öğretmek için eğitim oturumları gerçekleştirilmeli ve hemşirelik personelinin düzenli olarak denetimi el yıkama, maske, eldiven ve diğer kişisel koruyucu ekipmanları kullanma uygulamaları değerlendirilmelidir.

2023, 58 sayfa

Anahtar Kelimeler: Değerlendirme, Hemşireler, Bilgi, önleyici davranışlar, Yayılma, COVID 19

PREFACE AND ACKNOWLEDGEMENTS

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INDEX OF ABBREVIATIONS AND SYMBOLS

Mers-cov	Middle east respiratory syndrome coronavirus
Who	World health organization
Cov	Coronavirus
Sars	Severe acute respiratory syndrome
Sars-cov	Cevere acute respiratory syndrome coronavirus
Hcw	Health care worker
Ppe	Personal protective equipment
Hcp	Health care provider
ICN	International council of nursing
Hais	Hospital acquired infections
IPC	Infection prevention and control
KAP	Knowledge , attitude, and practice
RNA	Ribonucleic acid
Kb	Kilobases
ARDS	Acute respiratory distress syndrome
ACE2	Angiotensin-converting enzyme 2
Vocs	Variant of concern
PCR	Polymerase chain reaction
RdRp	RNA dependent RNA polymerase
CI	Confidence interval
CRP	C-reactive protein
Mcg	Microgram

LIST OF ABBREVIATIONS

P	p-value
SD	Standard deviation
T	t test



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1. INTRODUCTION

Severe acute respiratory syndrome (SARS) and the common cold are only a few of the symptoms that can be caused by coronavirus infections (Yin & Wunderink, 2018). Infectious diseases that can be transmitted between humans and animals are known as "zoonotic." Both the SARS (about 800 deaths) and Middle East Respiratory Syndrome Coronavirus (MERS-CoV) (roughly 860 deaths) epidemic outbreaks occurred in 2002 and 2012 (Li *et al.*, 2020). In addition to humans and other animals, COVID-19, a virus that belongs to a large family of viruses that are common in both species, can harm camels, cattle, cats, and bats. Currently, COVID-19 is a potentially fatal agent that has spread over the globe. Health care providers and nurses in particular are under their purview when it comes to limiting the spread of infectious diseases. Feleke *et al.* have found that a new member of the COVID-19 family can cause acute and severe respiratory disease in humans. (Feleke *et al.*, 2021).

Due to the rapid spread of COVID-19 and its severe symptoms, including sudden respiratory collapse, it is quickly turning into a public health catastrophe (Yalman, & Sancar, 2021). It has been confirmed by the WHO that COVID-19 is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV2). SARS-CoV-2 Infected individuals get symptoms 2–14 days after virus intake has taken place (4 days on average). COVID-19 is the name of a lethal strain of pneumonia caused by an uncommon coronavirus strain, such as SARS-CoV or MERS-CoV (Arslanca *et al.*, 2021). The COVID-19 virus has evolved into a new strain, and it's making its way through town. It is important to take the following precautions: (Keep at least a 1-meter distance from others when they cough, sneeze, or speak to limit the chance of infection.) Before putting on your mask, wash your hands well, and then do the same after taking it off. Take care to ensure that the garment covers your face, including your nose and mouth. Patients with soiled masks who are suspected or verified to be positive can utilize N95 respirators. (Alzyoud *et al.*, 2021).

According to doctors, sneezing or coughing may carry virus droplets that can be easily inhaled by people who are susceptible to the illness. Despite this, medical scientists

have discovered that this disease can spread in different ways as they continue to study it (Quisao *et al.*, 2021). Acute respiratory distress syndrome (ARDS) is a potentially fatal respiratory infection with symptoms ranging from a simple cold to a severe viral pneumonia. Thirteen million people have been infected, and at least 580,000 will have been infected by the COVID-19 virus by the end of 2020 (Ayed & Zabn, 2021). Currently, treatment options to deal with the virus include support and prevention aimed at limiting transmission in the community. Despite significant advancements in therapeutic procedures, there are currently over 2 million deaths in the world, including those among health care workers (HCW). HCW, particularly outside infectious diseases departments, were unprepared for this new and unexpected coronavirus epidemic. Probably the reasons for this illness on the HCW side were a lack of knowledge among HCWs about taking measures and inadequate training in the usage of personal protective equipment (PPE) (Rosa *et al.*, 2022).

Higher severity is more likely to occur in the elderly and those with chronic conditions. Avoiding COVID-19 is as simple as staying away from areas where it is present. To keep the sickness from spreading, there are numerous methods available, such as hand sanitizers and masks that cover the face. In addition, healthcare workers (HCWs) have a significant risk of infection and serve as the principal conduit for the spread of the disease throughout society (Huynh *et al.*, 2020). Thus, national health ministries all around the world have agreed to implement the World Health Organization (WHO) COVID-19 guidelines and recommendations. These treatments involve COVID-19 prevention and protection techniques and symptoms. Everyone should wash their hands thoroughly, avoid close contact, and wear a mask while coughing or sneezing to prevent the spread of disease, according to the Centers for Disease Control and Prevention (CDC). Albaqawi *et al.* (2020) say that preventive measures can only work as well as people's ability to understand, notice, and react to COVID-19 (Albaqawi *et al.*, 2020).

Handwashing, social isolation, and respiratory hygiene (covering mouth and nose while coughing or sneezing) are all important first-line defenses against the spread of infectious diseases. Delays in diagnosis and treatment due to a lack of knowledge on the part of health care workers can cause an illness to spread rapidly. As a result of a needs

assessment, the researcher might plan an educational session for the community's nurses (Priyadharishini *et al.*, 2022). Preventing infection transmission within the hospital and ensuring the safety of health care providers are critical components of an epidemic response, and this necessitates that health care providers keep up-to-date on the latest information on sources, transmission, symptoms, and preventative methods. Health care providers (HCPs) may be unable to accurately diagnose, treat, and prevent disease because of misunderstandings and a lack of information (Saqlain *et al.*, 2020). A global shortage of healthcare workers, beds, PPE, and other medical supplies was experienced by numerous healthcare facilities around the world during this epidemic. The outcome was a large amount of burnout and overwork for healthcare providers (Alrawashdeh *et al.*, 2021).

1.1. Importance

The COVID-19 outbreak has had a tremendous impact on the world at this time. More than 172,000 people have been sickened, and over 7,300 have died in Indonesia. Medical professionals were responsible for most of the deaths. On the other side, the Indonesian National Nurse Association estimates that there will be 70 fewer nurses in Indonesia by the end of August 2020 than there were in 2018. The global nursing shortage has been exacerbated by the COVID-19 pandemic. Nurses are more susceptible to COVID-19 during this pandemic, thus they require additional care and protection (Marthoenis, & Maskur, 2021). Numerous nations, including China, Spain, Italy, France, Türkiye, and the US and UK, have seen an increase in the number of infected medical personnel as a result of this pandemic. Only 360 deaths among nursing home employees have been reported, despite the fact that over 90,000 healthcare workers have been infected with COVID-19, according to the International Council of Nursing (ICN). Healthcare workers are more likely to become infected because of a lack of isolation rooms, a lack of proper training, and a lack of knowledge about the disease's course and transmission. Having a better understanding of the disease can have a positive impact on a person's attitude and conduct, which lowers their risk of infection (Alwani *et al.*, 2020).

A wide spectrum of healthcare specialists must be involved in the treatment of this highly contagious disease. In spite of the fact that this may sound like a good thing, research reveals that health care personnel's lack of awareness about the virus and inefficient infection control methods increase the risk of infection. Nurses are blamed for the spread of COVID-19, according to popular perception. The cycle of transmission of COVID-19 may be prevented if more people were aware of the disease and took preventative measures (El-Monshed *et al.*, 2021). Because of their intimate contact with Ebola patients, healthcare workers are more likely to become infected. Infections, hospitalizations, and/or isolation of healthcare workers have all contributed to a reduction in the global healthcare workforce in various countries (Schwartz *et al.*, 2020). As primary caregivers for patients, nurses are employed in great numbers. When the pandemic of COVID-19 swept the nation's hospitals, nurses were on the front lines of the battle. Nurses are more likely to get the disease than any other healthcare worker since they are generally the first to interact with patients who are showing signs of infection (Al Thobaity, & Alshammari, 2020). As a result of the COVID-19 epidemic, a lot of nurses died because isolation hospitals didn't follow good rules for keeping infections under control.

1.2. Problem Statement

Assessment of the nurses' knowledge and preventive behavior about the spread of COVID-19 at Al-Hussein hospital in Al-Nasiriya city.

1.3. Objectives

- To assess the nurse's knowledge about the spread of COVID-19.
- To assess the nurse's preventive behaviors about spread of COVID-19.

1.4. Research Questions

- What is the nurse's knowledge about the spread of COVID-19?
- What are the nurse's preventive behaviors regarding the spread of COVID-19?

1.5. Hypothesis

Null hypothesis

The nurses have adequate knowledge and preventive behaviors regarding COVID-19 transmission.

Researcher hypothesis

The nurses have inadequate knowledge and preventive behaviors regarding COVID-19 transmission.

2. GENERAL INFORMATION

2.1. Historical Study

The first human coronavirus was discovered in 1965. A stuffy nose was the only side effect. A collection of viruses with a crown-like appearance was found and named later in the decade by researchers. Seven different coronaviruses can infect humans. As soon as it was originally reported, SARS spread to 28 nations, including the United States, within a few months. By July 2003, more than 8,000 people had been afflicted, and 774 had died. In 2004, there were just four more cases of a mild outbreak. In addition to fever, headache, and respiratory difficulties like cough and shortness of breath, the symptoms of the coronavirus include these (Bhargava et al., 2021). A pandemic is a disease that has the potential to spread throughout the world. By virtue of their impact on human health and the following physiological effects, epidemics draw the public's interest. Humanity has been tormented by a wide variety of diseases, mass mortality, and epidemic disease outbreaks throughout history. In a long line of illnesses that have devastated the planet, COVID-19 is the newest. To begin with, there are the prefixes "corona," "vi," and "disease" in English. COVID-19 was developed after it was detected for the first time in 2019, and the number "19" was added to it (Yalman & Tosun, 2022).

Coronavirus disease 2019 (COVID-19) in Wuhan, China, is already causing global public health concern, more than a decade after the MERS-CoV outbreak. On January 30, 2020, the WHO declared COVID-19 a public health emergency. This virus, now known as COVID-19, has spread over the world, and it is now considered an epidemic. As of March 12th, 2020, more than 125,000 cases had been confirmed in 118 countries, with over 4600 deaths (Bhagavathula et al., 2020). A new coronavirus disease (COVID-19) quickly swept over the city of Wuhan, the capital of China's Hubei Province. After an instantaneous global spread, this disease quickly became an international health crisis. In the immediate aftermath of the virus outbreak, medical and nursing professionals' mental health was put to the test (Kang et al., 2020). Since December 2019, a new coronavirus disease (COVID-19) has spread from Wuhan, China, to other

Chinese cities and nations. On March 11, 2020, the World Health Organization (WHO) proclaimed the COVID-19 outbreak a pandemic. As of April 21st, there were 2.555.760 confirmed patients, with a further 75.254 suspected cases reported around the world (El-Monshed *et al.*, 2021).

More than 62 million cases have been documented in 220 countries and territories, and more than 1.400.000 people have died as of the second week of November 2020. COVID-19 had been confirmed in over 115,000 Egyptians, with 6.600 deaths. The 2020 coronavirus outbreak in Egypt is part of a worldwide coronavirus outbreak that began in 2013. On February 14, 2020, Egypt's Ministry of Health confirmed that COVID-19 was the principal cause in Egypt (Elasrag *et al.*, 2021). As single-stranded ribonucleic acid (RNA) viruses, coronaviruses (CoVs) have a linear, non-segmented genome. They have the largest genome of roughly 27–32 kb, encased in a helical nucleocapsid, out of all the RNA viruses. In honor of their crown-like look, they are referred to as CoVs. With varied degrees of seriousness, coronaviruses cause a wide range of respiratory and digestive illnesses in mammals and birds alike (Mulabbi *et al.*, 2021). For the first time in recent memory, a novel and potentially lethal coronavirus infection has been identified as COVID-19. ARDS can be lethal if left untreated, even if the symptoms are mild at first (Ayed, & Zabn, 2021). There have been more than 80,000 instances of COVID-19 recorded in China since the initial cases were reported from Wuhan, a city in Hubei Province. This includes both laboratory-confirmed and clinically diagnosed cases from Hubei Province. A WHO-China fact-finding mission projected that the pandemic peaked in China at the end of January and the beginning of February 2020. According to the WHO Hubei and the surrounding provinces have received the most attention; however, additional cases have been documented in other provinces and cities around China (McIntosh, 2020). As of 2019, the COVID-19 pandemic had become an international occurrence. Many countries will be dealing with a crisis in 2020 under a cloud of doubt about what will happen in 2021. To better understand COVID-19's impact in varied circumstances, the second year of the outbreak introduced fresh analysis and adjustments. Politicians all across the world face new challenges as vaccines become more widely available, novel variants proliferate, and lessons learned from 2020 emerge (Ayala *et al.*, 2021).

2.2. COVID-19 Virology

Coronaviruses are single-stranded RNA viruses with a diameter of 65–125 nm and a length of 26–32 kb. There are four subgroups of coronaviruses: alpha, beta, gamma, and delta. This makes it easy to organize them (d). Coronaviruses from the H5N1, H1N1, and MERS strains cause acute lung injury (ALI) and ARDS, both of which can cause respiratory failure and death in susceptible persons (Shereen et al., 2020). The RNA virus Coronavirus belongs to the family Coronaviridae of the genus Nidovirales. A group of viruses that cause respiratory disorders known as coronaviruses were first discovered in 1937 and given the coronavirus name in 1965 because of their crown-like appearance under the microscope. Coronavirus sickness in 2019 is caused by SARS-CoV-2, a novel coronavirus found following occurrences in China. The COVID-19 virus, which causes Middle East Respiratory Syndrome (MERS), also causes SARS (Lima, 2020).

As a member of the coronavirus family, it belongs to the Nidovirales order. All of these coronaviruses fall under one of the four coronavirus genera: coronavirus types 1, 2, 3, and 4. While both COVs and HIV can infect mammals, their prevalence in birds far outnumbers that of mammals in most cases. Coronaviruses that have been demonstrated to infect humans include SARS-CoV, MERS-CoV, OC43, and HKU1 (229E and NL63). Genomic and phylogenetic analysis show COVID-19 belongs to the same subgenus as SARS, but in a different lineage (Zhu et al., 2020). On January 7, 2020, it was obvious that this virus had a >95% similarity to the bat CoV and a >70% similarity to the SARSCoV. SARSCoV-2 has been tentatively designated by the International Committee on Taxonomy of Viruses. Because the receptor-binding gene area of the virus is similar to that of SARS-CoV (ACE2), the virus uses the same receptor, angiotensin-converting enzyme 2. This virus may have originated in wild animals like bats, but it has been shown to have been transmitted to humans through contact with other species (such as pangolins and snakes).

Table 2.1. Types of human coronavirus (Liu, 2020)

Strain	Discovery	Genera-Lineage	Cellular Receptor	Natural Host	Intermediate Host	Respiratory Symptom
HcoV-229E	1966	α	Aminopeptidase N (CD13)	Bats	Camelids	Mild
HcoV-OC43	1967	β -A	9- <i>O</i> -Acetylated sialic acid (SA)	Rodents	Cattle	Mild
SARS-CoV	2003	β -B	ACE2	Bats	Masked palm civets	Severe acute
HcoV-NL63	2004	α	ACE2	Bats	Unknown	Mild
HcoV-HKU1	2005	β -A	9- <i>O</i> -Acetylated sialic acid (SA)	Rodents	Unknown	Mild
MERS-CoV	2012	β -C	DPP4	Bats	Dromedary camels	Severe acute
SARS-CoV-2	2019	β -B	ACE2	Bats	Pangolin?	Severe acute

2.3. COVID-19 Clinical Findings

This virus can cause mild to severe symptoms, as well as death in some cases. On average, COVID-19 symptoms occur in 5.2 days after an incubation period of two to 14 days (Rahman et al., 2020). The following are some of the signs and symptoms of an upper respiratory tract infection (URI):

- Confusion and a throbbing headache
- Sore throat, hemoptysis, and a runny nose are all symptoms of the common cold.
- Diminished sense of smell or taste
- Muscle and chest pain, as well as rhinorrhea.
- Vomiting and diarrhoea are rarely reported together, but they might occur.

- New research shows that patients might become infected with the virus even though they show no signs of illness.
- Most COVID-19 patients, on the other hand, have a good prognosis and only experience minor symptoms, and they are able to recover within 7–10 days of supportive care. ARDS and pulmonary edema are significant causes of death for patients who have suffered organ failure and/or additional comorbidities.
- Patients are at risk for ARDS for five days after an infection has taken hold, and this can worsen during the following eight days. As a result of their general health and immune system, they may be experiencing abdominal pain or pneumonia. On average, a patient dies 14 days after their disease began (Sharma *et al.*, 2020).

2.4. Variant Strains

The SARS-CoV-2 virus, like other RNA viruses, may evolve into mutant forms that differ from their original forms when they adapt to new hosts. Many novel SARS-CoV-2 variants have been discovered during this pandemic; however, only a few have been classified as "variants of considerable concern" by the World Health Organization (VOCs). According to the WHO's most recent epidemiological update, five SARS-CoV-2 VOCs have been discovered since the pandemic began on December 11, 2021 (Cascella *et al.*, 2022):

- A.1.1.7 will be the first to appear in late December 2020 in the UK, followed by Beta (B.1.351).
- As early as early next year, Gamma and Delta are predicted to be found in Brazil, respectively.
- Omicron (B.1.1.529) will make its maiden appearance in South Africa in November 2021.

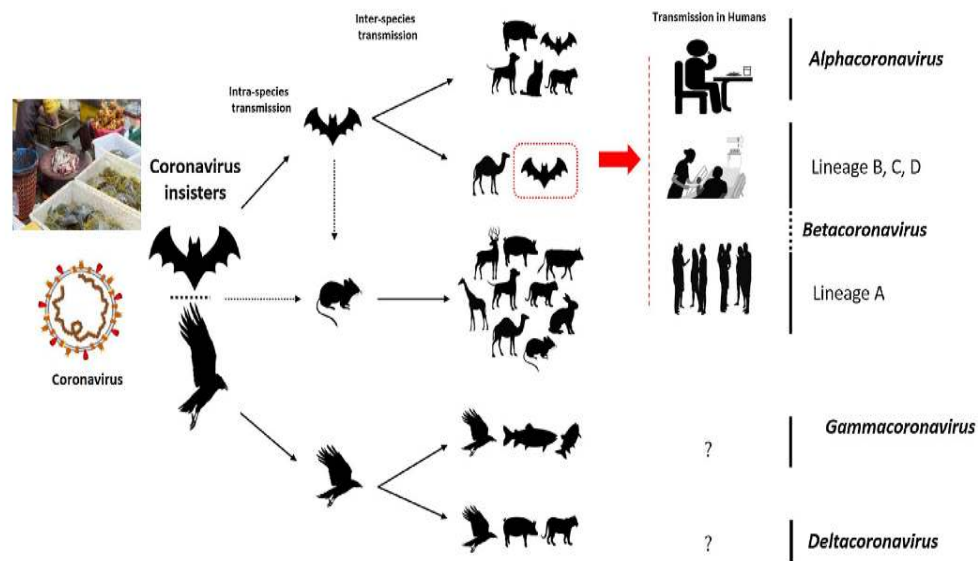


Figure 2.1: the key reservoirs and mode of transmission of coronavirus (Shereen et al., 2020)

2.5. COVID-19 Transmission Routes

The primary mode of transmission of SARS is human-to-human contact with an infected person carrying the SARS-CoV-2. When a virus discharged in respiratory secretions from a sick person coughs, sneezes, or speaks, it can infect another person if inhaled or comes into contact with the mucous membranes of another person at close range (i.e., within about six feet or two meters). Contamination of the hands, eyes, nose, or mouth by these fluids can cause disease even though contaminated surfaces are not considered to be the most typical route of transmission. However, the extent to which airborne SARS-CoV-2 contributed to the pandemic is presently uncertain (Leung, 2021; McIntosh, 2022). COVID-19 can be transmitted either directly or indirectly. Dental and surgical aerosols and respiratory droplet nuclei, as well as bodily fluids and secretions such as saliva, urine, semen, and tears, all fall under direct transmission in the direct mode. It is also possible to spread the virus from mother to child, but this occurs less often. The SARS-CoV-2 virus is thought to be spread predominantly by the airborne droplets expelled by an infected person's cough or sneeze. Objects used on or near an infected patient (e.g., a stethoscope or thermometer) can be sources of indirect transmission of an infectious disease (Karia *et al.*, 2020).

Viruses on contaminated surfaces, which can be transmitted to mucous membranes in the mouth, eyes, or nose by people who are susceptible to infection when they touch these surfaces, are another potential cause of illness. At the moment, however, it is not known if SARS-CoV-2 can be passed from an infected animal host to a person (McIntosh, 2022).

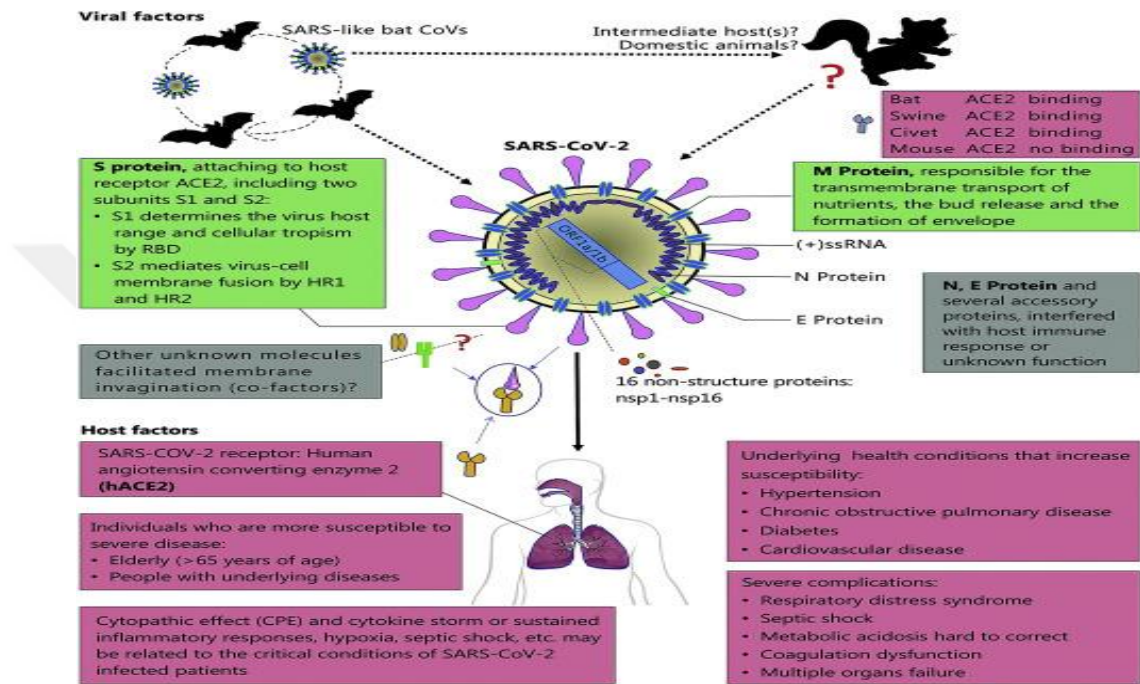


Figure 2.2: The structural and genetic characteristics of SARS-CoV-2 are shown in the top panel. It is known that the ORF 1a/b segment encodes nonstructural proteins (nsp 1–16) from the genome. Spike glycoprotein (S), envelope (E), matrix (M), and nucleocapsid protein code for the remainder of the genetic material (N). The bottom panel depicts the many host factors that can affect SARS-CoV-2 infection susceptibility and severity (Kirubananthan et al., 2021).

2.6. Chain of Infection

1. Bacteria, viruses, fungi, and protozoans are all examples of microorganisms that can be pathogenic. The term "pathogen" refers to anything that has the ability to infect or infect other organisms.

2. It is possible for microorganisms, such as bacteria, to reproduce or at least survive for a long period of time in reservoirs (e.g. in or on humans and animals or on objects such as sinks).
3. When an organism leaves the reservoir, it can do so via an exit portal (e.g. through the mouth from the respiratory tract, via the hands from contact with a patient).
4. Direct hand-to-hand contact, respiratory droplets or secretions, etc.) are some examples of the microorganism's mode of transmission.
5. An entrance via which the microbe can enter a new host.
6. A person who is sensitive to colonization or infection is known as a "susceptible host." This depends on the microbe's characteristics and the host's sensitivity at the time of transfer (colonization or infection) (Hashish *et al.*, 2015).

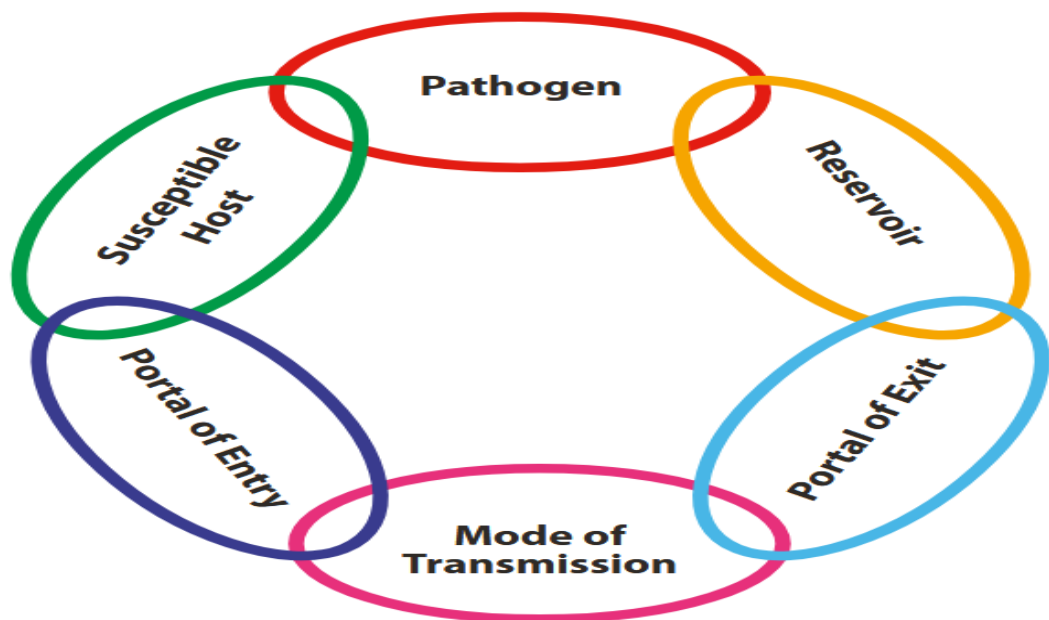


Figure 2.3: Chain of infection (Hashish *et al.*, 2015)

2.7. COVID-19 Diagnosis

A COVID-19 diagnosis can be made using a variety of methods, including molecular and serological techniques. They use real-time polymerase chain reactions (PCR) and gene PCRs for the molecular approaches. COVID-19 infections in respiratory secretions have been successfully detected using these assays. It is possible to further verify the PCR test result by sequencing the RNA-dependent RNA polymerase gene (RdRp). Serum tests for coronavirus antibodies are used to determine whether or not a person with COVID-19 is infected, even if they don't have any symptoms (Corman et al., 2020; Rahman *et al.*, 2020).

2.8. COVID-19 Epidemiology

The narrative of COVID-19 in the United States has a wide-ranging impact. The United States has the worst AIDS epidemic in the world. 28 million illnesses and 500,000 fatalities have been recorded in the United States, accounting for 25 percent of global cases and 20 percent of global deaths, although they only account for 4 percent of the world's total population at the time of this writing. In the United States, life expectancy will drop for the first time in a year in 2020 (Feachem, 2021). At the time of this writing, there have been 74,386 confirmed cases of the pandemic in Italy, with 7,503 deaths. (Gattoa and colleagues, 2020). If you're talking about the first few months, then as of June 22, 2020, 13% of all COVID-19 infections in Italy were caused by infected health care workers (HCWs). The fast spread of the virus in the health care industry has also upset physiotherapists (Gambazza *et al.*, 2021).

Between April 2, 2020, and May 12, 2020, a total of 279,478 people were asked to participate in the survey; 116,903 of them completed the questionnaire, and 106,848 of them were included in the results. Of the 62,099 months with follow-up, 3,335 cases of COVID-19 symptoms were discovered. Only 6.2 percent of lockdown participants reported experiencing COVID-19 symptoms on day 15 and 8.8 percent on day 45, with a 95% CI of 8.3 to 9.2 percentage points. COVID-19 symptoms were less common in the elderly and more prevalent in French districts with a high incidence of SARS-CoV-2

in France (Carrat *et al.*, 2021). There have been about 190,800 verified cases of COVID-19 in Saudi Arabia since June 30, 2020, with 1,649 deaths as a result. A case of COVID-19 was reported in Saudi Arabia on March 2, 2020. Temporarily halted due to the epidemic were air traffic and commercial buildings, as well as government offices and educational institutions. During this time, the Islamic holy sites of Makkah and Almadinah were closed to non-Muslims (Ahmad *et al.*, 2020). 77,995 reported cases in Iran's Eastern Mediterranean region, with an additional 52,229 cases retrieved and 4,869 deaths confirmed. The overall number of confirmed cases in Sudan was 32. Case fatality rates in Sudan and Algeria were 15.6% and 15.3%, respectively, while in Qatar and Kuwait they were both 0.2%. At 67.0%, Iran had the best recovery rate; at 2.5%, Somalia had the worst (Al-Tamimi *et al.*, 2020). A total of 242,969 confirmed cases, including 26,423 active cases, 215,820 recovered cases, and 726 deaths, have been reported by the United Arab Emirates as of January 14, 2021 (Alsuwaidi *et al.*, 2021).

There is no African country more at risk of SARS-CoV-2 infection than Egypt. Egypt announced the first African case of COVID-19 on February 14, 2020, and documented 10,000 instances within three months, more than twice the time it took Italy and the United States. 19,310 Egyptians (95 percent, confidence interval = 6,270-45,070) are predicted to have been infected by COVID-19 (Medhat, & El Kassas, 2020). There were 2,312,713 cases of COVID-19 in Iraq between January 3, 2020, and March 14, 2022, with 25,099 deaths, according to the WHO. As of March 4th, 2022, there have been 17,014,009 vaccinations administered worldwide (WHO, 2022).

2.9. Prevention Spread of COVID-19

Taking the following steps will help keep COVID-19 and other coronaviruses and influenza from spreading (World Health Organization, 2022).

- Use a face mask when you're in a public place.
- Keep a minimum of six feet of space between you and those around you.

- Stay away from large crowds.
- Spend time with friends and family in the great outdoors.
- Be sure to get vaccinated and re-vaccinated whenever possible.
- People who are ill should be avoided at all costs.
- Avoid putting fingers near the eyes, nose, or mouth.
- When you're sick, don't come to work.
- Tissues can be thrown in the garbage after they've been used to cover a cough or sneeze.
- Make it a habit to clean frequently-used items and surfaces on a regular basis.
- Use soap and water to wash your hands frequently (World Health Organization, 2022).

2.10. Vaccine of COVID-19

Though COVID-19 vaccines are an excellent and important tool, none of them are 100 percent successful in the prevention of COVID-19 sickness. A small percentage of the completely inoculated population will still fall sick to varying degrees from COVID-19 sickness (Vasireddy et al., 2021). Whole viruses, protein components, viral vectors, and nucleic acids are all being studied in clinical trials (RNA and DNA). A few of them try to sneak in the antigen, while others use the host's own cells to make the viral antigen (Gavi staff, 2020). The development of COVID-19 vaccines must take humoral and cellular immunity into account. Because COVID-19 is largely transmitted via respiratory contact, it is critical that the role of mucosal immunity in viral infection

prevention be given more attention. The virus contains four structural proteins. In addition to the proteins spike (S), envelope (E), matrix (M), and N, there are others (nucleocapsid). The S protein contains two sections, designated S1 and S2, that are unique from one another. The virus infects cells because the S protein binds to certain receptors. As a result, a neutralizing antibody against the S protein can prevent the virus from entering the host. The most important antigen for vaccine development is the S protein, which can also effectively trigger a T-cell immune response. N and M proteins can also cause a strong immune response in cells (Han et al., 2021).

Primary series: Two intramuscular doses of 30 mcg (0.3 mL of the purple or gray cap formulation) are given three weeks (21 days) apart. Healthy individuals <65 years old can extend the interval to eight weeks; this strategy may be preferred for adolescents and young adults (particularly men age 12-39 years) who do not need to maximize protection within a shorter period of time (Edwards, & Orenstein, 2022). After the first or second dose of the COVID-19 vaccine, you may notice redness or swelling at the injection site, a fever, tiredness, aches in your muscles and joints, and swollen lymph nodes. Most of the unpleasant symptoms will go away after a week or two (McCallum, 2020; Bugos, 2021).

2.11. COVID-19 Complication

Even after more than a year of this pandemic, the frequency and risk factors associated with the consequences or sequelae of an acute illness with COVID-19 remain unknown. Long- and post-COVID-19 syndromes (LCS) are ill-defined conditions. Post-COVID-19 syndrome is now defined by the persistence of clinical symptoms. Symptoms that emerge during or after a period of more than 12 weeks after being exposed to COVID-19. In addition, there is no alternative diagnosis that may account for this. In addition to systemic, psychiatric/psychological, ear, nose, throat, and skin symptoms, as well as general status impairment (Domènech-Montoliu et al., 2022), there are also problems with the immune system.

A study by Desai et al., (2021) stated the following COVID-19 complications:

1. Neuropsychiatric: Brain fog, anxiety, depression, post-traumatic stress disorder
2. Cardiovascular: Myocarditis, heart failure, arrhythmias
3. Pulmonary: Dyspnea, oxygen dependence, pulmonary function test abnormalities
4. Hematology: Venous thromboembolism
5. Musculoskeletal: Myalgia, arthritis, physical debility
6. Dermatologic: Rash, alopecia, urticaria
7. Gastrointestinal: Diarrhea, nausea, vomiting, abdominal pain
8. Renal: Kidney damage
9. Endocrine: Diabetes mellitus

2.12. Studies on Nurses Knowledge About COVID-19

2020 COVID-19 outbreak research will focus on nurses' knowledge, attitude, behavior, and psychological reaction to this disease (knowledge, attitude, practice, and psychological response to COVID-19 in northern Ethiopia, 2020). More than 400 nurses took part in the research, and each and every one of them accurately responded to the survey questions. In this study, 58.1 percent of participants were female. A total of 307 of the 415 nurses (74 percent) had a good understanding of COVID-19, as well as pleasant attitudes and disturbed psychological responses (Tadesse et al., 2020). There was a survey of Indonesian nurses regarding their knowledge, attitudes, and practices regarding COVID-19. According to the study, this is the case. The correct level of

knowledge was found to be 85.60 percent. COVID-19 nurses were shown to have no significant differences in knowledge, attitude, and practice (KAP) items compared to other nurses ($P>0.05$). Positive attitudes and good virus transmission avoidance tactics characterized their approach to the pandemic. In the wake of COVID-19, many nurses feared they would become infected (91.53 percent) (Marthoenis, and Maskur, 2021).

When the current COVID-19 pandemic hit the Occupied Palestinian Territory (oPt), researchers conducted a questionnaire-based cross-sectional study to gauge nurse knowledge, attitude, and application of protective measures to see how they fared in the fight against the virus there. More than 75% (SD: 12.4%) of respondents reported a high level of knowledge, attitude, and preventative measures used, with a mean of 75.7 percent (SD: 12.4 percent). P-values as low as 0.004 and as high as 0.005 were found to be significant predictors of knowledge in numerous linear regression models, for example. You're more likely to have a positive attitude toward life if you're female (p-value = 0.005) and have been diagnosed with COVID-19 (p-value = 0.001). Preventative measures were more frequently used by students who rated their academic achievement as high (p-value = 0.010) (Shawahna, 2021). Nurses' knowledge, anxieties, and perceptions of the COVID-19 pandemic's impact and preparedness were examined in a descriptive study titled "Nurses' knowledge, fears, and perceptions of the COVID-19 pandemic's impact and preparedness." A cross-sectional investigation. The virus' features were known by more than eight out of ten nurses (81.6 percent), and 83.6 percent of those polled considered that their work put them at risk of infection with COVID-19 (El-Monshed et al., 2021). There was a descriptive study carried out in Tigray to assess healthcare professionals' knowledge, perceptions, and preventative practices toward COVID-19 in Tigray, North Ethiopia (Assessment of Knowledge and Behaviours Regarding Prevention of COVID-19 Among Healthcare Professionals in Tigray). There were 79 people with adequate knowledge, 88 with adequate knowledge, and 64.3 with adequate knowledge. Both a positive public image and sound preventative measures against COVID-19. On the other hand, the COVID-19 virus was clearly grasped by 92% of the trial participants' treatments for illness and immunization. Data showed that 55% of those polled agreed with the statement and didn't always wear the proper personal protective equipment (PPE) (Gebremeskel et al., 2021).

Nursing staff's KAP were examined in this study KAP and COVID-19 Influencing Variables on KAP. This year, only 14.3 percent of psychological nursing knowledge was accurate, compared to 21.5 percent the year before. There is a significant difference between isolation ward nurses and general ward nurses in terms of KAP, with an odds ratio of 1.776 (95 percent confidence interval: 1.491–2.116) and a practice score of 1.90 (95 percent confidence interval: 1.590–2.274). Nursing staff with fewer than 10 years of experience had OR values of 0.990, 0.654, and 0.747, respectively, according to KAP's findings, which were based on the 95 percent confidence intervals (Wen et al., 2021). As a part of their research, scientists ran an experiment to see what effect a nursing education program had on nurses' understanding and practices related to pandemic COVID-19 in the isolation unit. Nurses' total knowledge and total practice were found to be positively correlated. Following the completion of a training course, nurses' abilities to care for a COVID-19 patient improved statistically considerably (Abd ElAziz et al., 2021).

A quasi-experimental study was conducted to see if an educational intervention aimed at improving nurses' knowledge and practice of the COVID-19 may have any effect. The study found that 55.7 percent of nurses reported a lack of understanding prior to treatment. However, after the intervention, 88 percent of them had a high degree of understanding. Also, only 7.1% of the nurses surveyed were skilled in COVID-19 before training. In the meantime, 94.3 percent of participants reported adequate practices following training (Said, 2021). For this study, researchers surveyed nurses at tertiary care hospitals about their knowledge, attitudes, and practices addressing the prevention and control of COVID-19 in the tertiary care setting. According to the findings, 60.3% of individuals possessed very strong knowledge, while 53.2% possessed information they considered adequate. In practice, 100% of them had a good outlook on the COVID-19 prevention and control procedures. Most of them (75.8%) agreed that they could handle the breakout of COVID-19 confidently. 85.8% of respondents expressed concern that they and their families could become infected with COVID-19 while working at the hospital. 39% felt disconnected from their family and friends because of their occupation (Paudel et al., 2021). Cross-sectional research was conducted in Riyadh, Saudi Arabia, on healthcare workers' (HCWs') understanding of

the coronavirus disease (COVID-19). 67.8% of participants didn't know enough about COVID-19, and only 72.2% of individuals had a favorable view toward it, according to the results. Low KAP was found to be a factor among students who received poor marks. The girls were better prepared and more enthusiastic, whereas the boys were more inclined to put in the necessary time and effort to improve their skills. In terms of attitude, individuals from the nursing profession had a lower one than those from other medical fields, but it didn't stop them from being the best at using the correct approaches (Almohammed et al., 2021).

2.13. Nursing Intervention for COVID-19

COVID-19 patients, particularly those with fever, severe respiratory sickness, and other signs of infection, should be assessed and managed with extreme caution (Hetzler, 2020).

- Include any excursions you've taken to places where there are active COVID-19 cases in your travel history.
- Symptoms can emerge anywhere from two to fourteen days following exposure. There should be comprehensive documentation of the patient's physical symptoms and indicators during their medical checkup. Risks to skin integrity, tiredness, gas exchange, nutrient requirements, and vomiting are also considered.
- Patients, their families, and healthcare workers from being infected with COVID-19.
- Increasing the patient's awareness of COVID-19 and its treatment options.
- Fever and dyspnea are the most prevalent symptoms of COVID-19, so keep a close check on them. A pulse oximeter can be used to monitor O₂ saturation levels in patients with severe COVID-19 symptoms, which warrants the use of supplemental oxygen (Belleza, 2021).

- The use of proper treatment for hyperthermia, such as reducing the temperature of the room and eliminating unnecessary clothing and bedding, is critical during a fever. All visitors to restricted access rooms must wear respiratory protection such as masks or gowns while entering restricted access rooms in order to maintain respiratory isolation.
- Cold packs on major blood vessels, intravenous fluids, and oxygen therapy should be used in the event of respiratory issues (Hetzler, 2020).
- Severely ill patients should be given antiviral medications, immunoglobins, and hormones to maintain their electrolyte and acid-base balances. As an added precaution, individuals with hypoxia or a negative nitrogen balance should be provided oxygen by nasal catheter or mask while also having their vital signs monitored. Standard laboratory tests such as C-reactive protein (CRP) and blood gas analysis should be included in this monitoring. If necessary, they should also have imaging tests (Zhao et al., 2021).
- In order to reduce or prevent the spread of coronavirus, patients and anybody who enters or exits the room should wash their hands after coughing.
- Because of the contagious nature of the coronavirus, it is critical that patients and those close to them are made aware of how it spreads and what they can do to avoid contracting the sickness.
- Psychotherapy, such as relaxation exercises, breathing exercises, and words of encouragement, can help people with COVID-19 deal with their anxiety (Hetzler, 2020; Fernandes et al., 2022).

3. MATERIAL METHODS

3.1. Study design

A descriptive cross-sectional study was conducted at Al Hussein Hospital in Al Nasiriya City from February 1st to May 15th, 2022, to assess nurses' knowledge and preventive behaviors regarding the spread of COVID-19.

3.2. Setting and Sample of the Study

➤ Place and Sample

The study sample consists of 150 nurses from Al-Hussein Hospital who were chosen through convenience sampling (non-probability sampling). The power analysis program G power package was utilized. When the effect size, P, and sample size were 3.0, 0.05, and 150, respectively, the power analysis yielded a value of 0.98 (Figure 3.1 and 3.2).

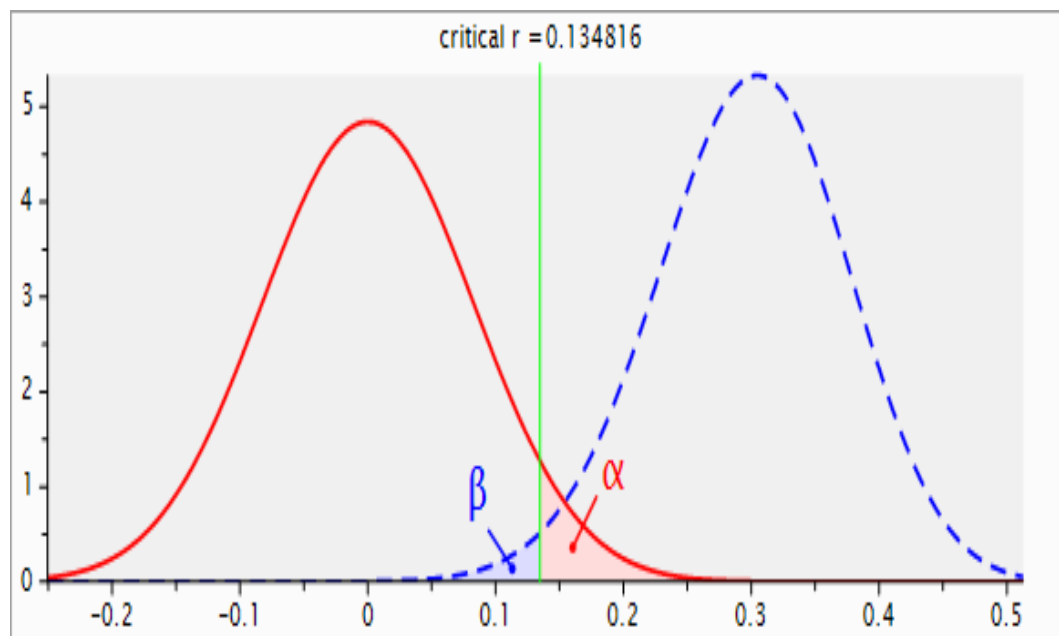


Figure 3.1. G- power analysis

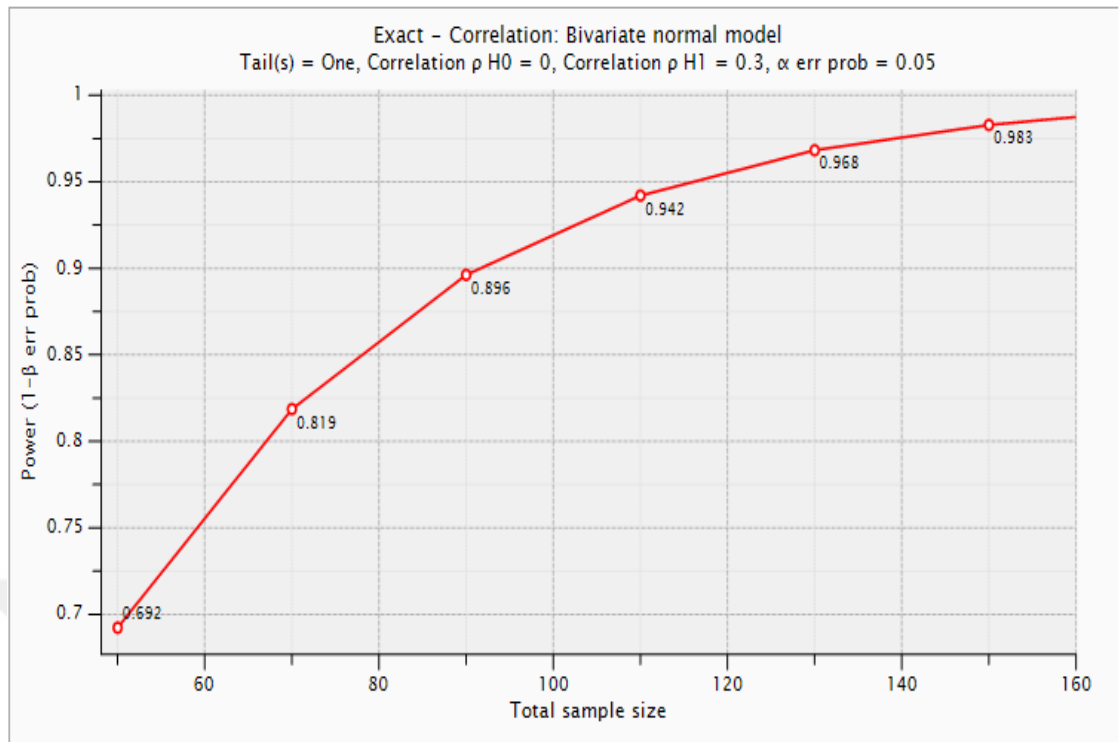


Figure 3.2. G- power analysis

➤ **Inclusion criteria of sample**

The inclusion criteria for choosing the sample include both genders, all ages, all educational levels, and agreement to participate in the study.

➤ **Exclusion criteria of sample**

Refusal to participate in the study.

3.3. Study Instrument

The study instrument is a questionnaire composed of three parts:

- Demographic characteristics include age, gender, educational level, years of service, and marital status.

- The Arabic version of the questionnaire included 12 questions that addressed three different areas of nursing knowledge: It is critical to have a thorough understanding of the signs and symptoms, transmission mode, preventative measures, and follow-up care (five items) (Albaqawi and colleagues, 2020).
- Preventive behavior items: This part consists of 13 items (Albaqawi et al., 2020).

3.4. Validity

Nine infection control and prevention experts examined the scale's content validity and came to the conclusion that the knowledge questionnaire had sufficient validity to be used in clinical settings. There was a content-validity value of 0.97 for the 13 preventative behaviors studied (Albaqawi et al., 2020).

3.5. Reliability

The Cronbach's alpha for the knowledge scale was 0.71, which indicates strong reliability. According to Cronbach's alpha of 0.976, the preventative behavior scale is both valid and dependable (Albaqawi et al., 2020). The researcher also collected data on preventive behavior by observing 30 nurses and excluding them from the original trial; this data was omitted. Preventive behavior measures are tested to ensure their validity. Cronbach's alpha coefficient (0.741) was found to be within acceptable limits.

3.6. Ethics Committee Approval

The ethics committee of Çankırı Karatekin University granted permission to Al Nasiriya City's director of health services to make data collection easier at the city's hospitals. The research was performed at the Al Nasiriya City Health Department/Training and Human Development. At the outset, written permission was obtained from the Al Hussein Hospital in Al Nasiriya City, where the study was conducted, and the data was

obtained. The researcher first explains the study and its objectives to the participants, then asks them to sign a consent form and begins collecting data from them.

3.7. Data Collection

From the 27th of December, 2021, to the 26th of February, 2022, data was gathered. To get the demographic characteristics of the sample, an interview was conducted with the study participants to get their permission to participate in the study as well as their verbal assent. The data was acquired from the participants in the study using a combination of self-report and observation techniques. Data collection typically takes between 25 and 35 minutes.

3.8. Data Analysis

Data analysis by using Statistical Package for Social Science (SPSS) version (22.0).

3.8.1. Descriptive data analysis

Frequency (f)

Percentage: The formula used to calculate the percentage is:

$$\% = \left(\frac{\text{frequency}}{\text{sample size}} \right) \times 100\%$$

Mean: Is the arithmetic average of the distribution. The formula used to calculate the Mean is:

$$\bar{x} = \frac{\sum x_i}{n}$$

Standard deviation:

3.8.2. Inferential data analysis

Independent sample T-test (T): It is a statistical technique used to analyze the comparative mean of two independent groups. In this study, the following is used to compare the knowledge levels and preventive behaviors of nurses between genders:

$$t = \frac{\bar{X}_2 - \bar{X}_1}{\sqrt{\frac{\sum D^2 - \frac{(\sum D)^2}{n}}{n(n-1)}}$$

(Randolph & Myers, 2014).

One-Way ANOVA: A one-way test (ANOVA) is used to see if there are any significant differences between the means of three or more independent (unrelated) groups. It was used in this study to determine whether there is a statistically significant relationship between nurses' demographic variables and their knowledge or preventive behaviors. It has the following form:

Source of variance	Sum of square	d.f	Mean square	F
Between Groups	$SS_B = \sum \frac{(\sum xP1)^2}{n} - \frac{(\sum xP)^2}{N}$	$df_B = K-1$	$\frac{MS_B}{MS_W}$	$\frac{MS_B}{MS_W}$
Within Groups	$SS_W = \sum \frac{(\sum xP1)^2}{n} - \frac{(\sum xP)^2}{N}$	$df_w = N-k$	$\frac{SS_W}{DF_w}$	
Total	$SS_T = \sum \frac{(\sum xP1)^2}{n} - \frac{(\sum xP)^2}{N}$	$df_t = N-1$		

Shortcuts for measuring important compared to the level, are used as follows:

NS: Non significantly at probability-value >0.05.

S: Significantly at probability-value <0.05.

Post Hoc test: A post hoc test (bonferroni correction) is used only after we find a statistically significant result and need to determine where our differences truly came from

$$HSD = q \sqrt{\frac{MS_{within}}{n}}$$

NS: Non significantly at probability-value >0.05.

S: Significantly at probability-value <0.05.

4. RESULTS

Table 4.1: Distribution of the sociodemographic characteristics of nurses.

Variables	Frequency	Percent (%)
Gender		
Male	44	29.3
Female	106	70.7
Total	150	100.0
Age		
20-29	111	74.0
30-39	32	21.3
40-49	7	4.7
Total	150	100.0
Level of education		
Secondary school graduate	26	17.3
Institute	74	49.3
Bachelor or Higher	50	33.3
Total	150	100.0
Marital status		
Single	74	49.3
Married	73	48.7
Widowed	3	2.0
Total	150	100.0
Years of service		
1-5	112	74.7
6-10	21	14.0
11-20	17	11.3
Total	150	100.0

According to the table, 106 (70.7%) of nurses are female; 111 (74%) of nurses are between the ages of 20 and 29; 74 (49.3%) of nurses have a nursing diploma; 74 (49.3%) of nurses are single; and 112 (74.7%) of nurses have between 1 and 5 years of service.

Table 4.2: Distribution of nurses' knowledge about spread of COVID-19 (n=150)

Items	Frequency	Percent (%)
Clinical presentation		
The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, shortness of breath, diarrhea, and myalgia		
Yes	146	97.3
No	4	2.7
Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus		
Yes	115	76.7
No	35	23.3
There currently is no effective cure for COVID-2019, but early symptomatic and supportive treatment can help most patients recover from the infection		
Yes	141	94.0
No	9	6.0
Not all persons with COVID-2019 will develop to severe cases. Only those who are elderly, have chronic illnesses, and are obese are more likely to be severe cases		
Yes	123	82.0
No	27	18.0
Transmission route		
Eating or contacting wild animals would result in the infection by the COVID-19 virus		
Yes	110	73.3
No	40	26.7
Persons with COVID-2019 cannot infect the virus to others when a fever is not present		
Yes	108	72.0
No	42	28.0
The COVID-19 virus spreads via respiratory droplets of infected individuals		
Yes	136	90.7
No	14	9.3
Prevention and control		
Ordinary residents can wear general medical masks to prevent the infection by the COVID-19 virus		
Yes	133	88.7
No	17	11.3
It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus		
Yes	48	32.0
No	102	68.0

Table 4.2: Distribution of nurses' knowledge about spread of COVID-19 (n=150)
(continued)

Items	Frequency	Percent
To prevent the infection by COVID-19, individuals should avoid going to crowded places such as train stations and avoid taking public transportations		
Yes	138	92.0
No	12	8.0
Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus		
Yes	141	94.0
No	9	6.0
People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the observation period is 14 days		
Yes	133	88.7
No	17	11.3

97.3 percent of nurses are familiar with COVID-19's most common symptoms, which include fever, fatigue, coughing up phlegm and chest pain and breathlessness, diarrhea, and myalgia. 76.7 percent of those infected with COVID-19 reported fewer symptoms such as runny nose, stuffy nose, and sneezing. However, the vast majority of people may recover from COVID-2019 provided they address their symptoms early and receive supportive care (94 percent). Eighty-two percent of the nurses polled believe that not all COVID-2019 patients will suffer life-threatening complications. Only the elderly and obese are at risk of acquiring a life-threatening condition. The COVID-19 virus can be transmitted to new patients by inhaling respiratory droplets breathed by people who are infected. Nurses, for example, are well-versed in a number of areas, such as the virus' transmission path, the fact that sick people cannot transmit the disease to others, and the virus' transmission route to other humans when a fever is absent.

Most nurses (88%) are aware that patients can use generic medical masks to protect themselves from infection, whereas 68% are aware that children and youth (92%) do not need to take precautions against the COVID-19 virus to prevent its transmission. COVID-19 should not be dispersed in populated areas such as railroad stations or on public transit (94 percent). Most nurses (88.7 percent) are well-versed in containing the COVID-19 virus by isolating and treating patients who are infected. Quarantine any individuals who come into contact with a COVID-19 virus-infected person immediately. A minimum of 14 days of observation is required.

Table 4.3: Distribution of nurses' preventive behavior about spread of COVID-19
(n=150)

Items	Frequency	Percent
I wash my hands with soap and water for at least 20 seconds after I have been in a public place		
Never	3	2.0
Sometimes	76	50.7
Always	71	47.3
I wash my hands with soap and water for at least 20 second after blowing my nose, coughing, or sneezing		
Never	9	6.0
Sometimes	69	46.0
Always	72	48.0
If soap and water are not readily available, I use a hand sanitizer that contains at least 60% alcohol		
Never	7	4.7
Sometimes	52	34.7
Always	91	60.7
I avoid touching my eyes, nose and mouth with unwashed hands		
Never	13	8.7
Sometimes	45	30.0
Always	92	61.3
I avoid close contact with people who are sick		
Never	22	14.7
Sometimes	47	31.3
Always	81	54.0
I put distance between myself and other people		
Never	8	5.3
Sometimes	67	44.7
Always	75	50.0
I stay at home if I'm sick, except to get medical care		
Never	10	6.7
Sometimes	40	26.7
Always	100	66.7
I cover my mouth and nose with a tissue when I cough or sneeze or use the inside of my elbow		
Never	7	4.7
Sometimes	37	24.7
Always	106	70.7
I throw used tissues in the trash		
Never	6	4.0
Sometimes	49	32.7
Always	95	63.3
I wear facemask if I am sick		
Never	5	3.3
Sometimes	41	27.3
Always	104	69.3

Table 4.3: Distribution of nurses' preventive behavior about spread of COVID-19
(n=150)(continued)

Items	Frequency	Percent
I clean and disinfect frequently touched surfaces daily		
Never	8	5.3
Sometimes	62	41.3
Always	80	53.3
I clean surfaces that are dirty		
Never	8	5.3
Sometimes	65	43.3
Always	77	51.3
I follow the rules implemented by the government during this COVID-19 outbreak		
Never	2	1.3
Sometimes	73	48.7
Always	75	50.0

It was found that 19% of nurses wash their hands with soap and water for at least 20 seconds each time they enter a public location (48 percent). 60.7 percent of respondents stated that they only use an alcohol-based hand sanitizer when soap and water are not readily available. I avoid touching my eyes, nose, and mouth with my bare hands more than two-thirds of the time when someone is ill. For a limited time only (50 percent), I've always kept a respectable distance from people to keep myself safe. When I'm sick, prefer to stay in bed instead of going to the doctor's office. When I cough or sneeze, I always use a tissue to cover my mouth and nose, and 70.7 percent of nurses do the same. In order to comply with the government's COVID-19 outbreak-related restrictions, I wear a face mask and clean unclean surfaces at a rate of 53.3 percent per day and 51.3 percent per day while I'm ill.

Table 4.4: Nurses' scores related knowledge and preventive behavior about the spread of COVID-19.

Domains	Mean	SD	Minimum	Maximum
<i>Clinical presentation (4-8)</i>	7.50	0.66	5	8
<i>Transmission route (3-6)</i>	5.36	0.73	3	6
<i>Prevention and control (5-10)</i>	8.95	0.78	6	10
Total knowledge (12-24)	21.83	1.46	17	24
Preventive behavior (13-39)	32.74	3.64	25	39

Abbreviations: SD= standard deviation

This table shows that the nurses have mean for all domains of knowledge and preventive behavior, (7.50) for clinical presentation of COVID-19, (5.36) for transmission route, (8.95) for prevention and control, (21.83) for overall knowledge about spread of COVID-19, and (32.74) for preventive behavior about COVID-19.

Table 4.5: Distribution of nurses' scores obtained from knowledge and preventive behavior about the spread of COVID-19.

Scale	Gender	N	Mean	SD	P0	P1	P2	P3
Knowledge	Male	44	21.93	1.47	0.525 ^a			
	Female	106	21.76	1.46				
Preventive behavior	Male	44	32.34	3.72	0.391 ^a			
	Female	106	32.91	3.62				
Scale	Age	N	Mean	SD	P0	P1	P2	P3
Knowledge	20-29	111	21.58	1.49	0.005 ^b	0.179	0.009*	0.972
	30-39	32	22.44	1.22				
	40-49	7	22.57	1.13				
Preventive behavior	20-29	111	32.55	3.56	0.040 ^b	0.147	0.286	0.046*
	30-39	32	33.91	3.56				
	40-49	7	30.43	4.19				
Scale	Marital status	N	Mean	SD	P0	P1	P2	P3
Knowledge	Single	74	21.68	1.47	0.182 ^b			
	Married	73	21.98	1.42				
	Widowed	3	20.66	2.08				
Preventive behavior	Single	74	32.38	3.37	0.293 ^b			
	Married	73	33.18	3.76				
	Widowed	3	31.00	7.00				
Scale	Education	N	Mean	SD	P0	P1	P2	P3
Knowledge	Nursing secondary school	26	22.38	1.63	0.092 ^b			
	Diploma	74	21.82	1.36				
	Bachelor or higher	50	21.46	1.45				
Preventive behavior	Nursing secondary school	26	33.15	3.68	0.297 ^b			
	Diploma	74	32.74	3.24				
	Bachelor or higher	50	32.95	4.33				
Scale	Years of service	N	Mean	SD	P0	P1	P2	P3
Knowledge	1-5	112	21.63	1.49	0.052 ^b			
	6-10	21	22.28	1.49				
	11-20	17	22.36	0.78				
Preventive behavior	1-5	112	32.55	3.561	0.146 ^b			
	6-10	21	33.67	3.903				
	11-20	17	33.66	3.34				

Abbreviations: N= number, SD= standard deviation, ^a student t test, ^b one-way ANOVA, p1= post-hoc test (bonferroni correction) for pairwise comparison of the first and second groups, p2= post-hoc test (bonferroni correction) for pairwise comparison of the first and third groups, p3= post-hoc test (bonferroni correction) for pairwise comparison of the second and third groups.

According to the results of the comparative table, the levels of female and male nurses were similar in terms of knowledge ($p= 0.525$) and preventive behavior ($p= 0.391$) levels. When comparing knowledge and preventive behaviors by age, nurses aged 40-49 were found to be more knowledgeable than nurses aged 20-29 ($p= 0.009$). When comparing preventive behavior by age, it was found that nurses aged 30-39 displayed more conscious behaviors than nurses aged 40-49 ($p= 0.046$). When the knowledge and preventive behaviors of the participants were examined according to their marital status and education level, it was seen that the marital status or education level of the participants had no effect on their knowledge and preventive behaviors ($p>0.05$). Similarly, it was seen that the duration of the participants' work in the service did not have an effect on knowledge and preventive behaviors ($p>0.05$).

5. DISCUSSION

97.3 percent of nurses are familiar with COVID-19's most common symptoms, which include fever, fatigue, coughing up phlegm and chest pain and breathlessness, diarrhea, and myalgia. 76.7 percent of those infected with COVID-19 reported fewer symptoms such as runny nose, stuffy nose, and sneezing. However, the vast majority of people may recover from COVID-2019 provided they address their symptoms early and receive supportive care (94 percent). Eighty-two percent of the nurses polled believe that not all COVID-2019 patients will suffer life-threatening complications. The elderly, those with long-term health problems, and obese people are also at risk for developing severe instances. COVID-19's clinical presentation is a 7 out of 10 on a 7-point scale. The following studies lend credence to this.

In a descriptive analysis, 91 percent of nurses were able to identify the most common clinical signs of COVID-19, including fever, exhaustion, dandruff, shortness of breath, diarrhea, and arthralgia (KAP and psychological response toward COVID-19 among nurses during the outbreak of COVID-19 in northern Ethiopia in 2020). Sneezing, stuffy nose, and runny nose are less common in those infected with the COVID-19 virus. Although there is no effective treatment for COVID-2019 at this time, the majority of nurses (50.1 percent) believe that most patients can recover with early symptomatic and supportive care (Tadesse et al., 2020). Students' views, knowledge, and conduct in regard to COVID-19 were examined by researchers. The most common clinical signs of COVID-19, such as fever, weariness, dry cough, shortness of breath, diarrhea, and myalgia, were all well known by nurses in a multi-university study. The COVID-19 virus, unlike the typical cold, does not cause a runny nose, a stuffy nose, or sneezing. Although there is no treatment for COVID-2019, the majority of individuals are able to recover with early symptomatic and supportive care (90.5 percent of nurses). 70 percent of nurses are aware that not all COVID-2019 sufferers will end up with severe cases. Only the elderly, those with long-term health conditions, and those who are fat are at risk of becoming severe cases (Albaqawi et al., 2020).

The most prevalent symptoms of COVID-19 are fever, cough, shortness of breath, weakness, and muscle discomfort, according to a survey of Turkish healthcare personnel (Knowledge, preventive behaviors, and risk perception of the COVID-19 pandemic: A cross-sectional study in Turkish health care workers). Eighty percent of people are aware that infections with COVID-19 are less likely to result in runny noses, nasal congestion, and sneezing than other types of infections (Arslanca et al., 2021). A descriptive study (KAP of Indonesian nurses about COVID-19: A cross-sectional study in a referral hospital) found that fever, tiredness, a dry cough, shortness of breath, and myalgia (a type of muscle pain) are the most common signs of COVID-19. People with the COVID-19 virus have fewer symptoms of a cold, such as a stuffy nose, a runny nose, and sneezing. COVID-19 does not have an effective treatment at this time. Most people, however, can recover from the illness if they receive early symptomatic and supportive care. At least 96% of nurses are aware that not all COVID-19 patients will progress to more serious stages of illness. People who are old, sick, or obese are most at risk of developing severe cases of this illness (Marthoenis & Maskur, 2021).

While there is currently no cure for the COVID-19 infection, early symptomatic and supportive treatment is recommended for those who show signs and symptoms. One study found that 97 percent of nurses were familiar with the symptoms and signs of the COVID-19 infection, including fever, sore throat, cough, and myalgia (Shawahna, 2021). SARS-CoV-2 illness can be disseminated through coughing, sneezing, or spitting, according to research by Maurya et al. (2022). 96 percent of nurses are aware of this. Infected people spread the COVID-19 virus to others by inhaling respiratory droplets they exhale. An infected person cannot convey the virus to others, and nurses are well-versed in all of this information. They also know how the virus spreads from an infected person to other people. A transmission path has a standard deviation of 5.36. The outcomes of the current study formed the basis for the subsequent investigations. There are 54.2 percent of nurses who have good knowledge about the COVID-19 virus, 48.4 percent who have good knowledge that people with COVID-19 cannot infect others with the virus when a fever is not present, and 76.2 percent who have good knowledge about the virus spreading via respiratory droplets from infected individuals.

The COVID-19 virus is well-known to 47.1 percent of nurses, and the disease is well-known to 83.6 percent, according to Albaqawi et al. (2020). A temperature does not make COVID-2019 contagious, and 92 percent of nurses have a good grasp of the condition. Sputum droplets from infected people disseminate the COVID-19 virus through the air. Health care personnel know that COVID-19 can be spread through breathing droplets in 90 percent of cases, talking in 94% of cases, and shaking hands in a whopping 96 percent of cases, according to a recent survey of those in the field (Arslanca et al., 2021). Only 6.8 percent of nurses are aware that people with COVID-19 cannot spread the virus to others even if they are feverish, and an overwhelming majority (95.8 percent) of nurses are aware that the COVID-19 virus is spread through respiratory droplets from infected individuals, as reported by Marthoenis & Maskur, (2021). It is widely accepted that patients in crowded areas are more likely to contract the illness. A study called "Knowledge and Attitude Towards COVID-19: Palestinian Perspective" (Ayed & Zabn, 2021) found that 58.7 percent of nursing students knew that COVID-19 can be passed from person to person.

Nurses in a study (KAP Regarding Prevention and Control of COVID-19 Among Nurses at a Tertiary Care Hospital) were aware that the predominant method for transmission of COVID-19 was airborne, according to the study's findings. Most nurses (88 percent) are aware that patients can use generic medical masks to protect themselves from infection, whereas 68 percent are aware that children and youth do not need to take precautions against the COVID-19 virus to prevent its transmission. COVID-19 should not be dispersed in populated areas such as railroad stations or on public transit (94 percent). COVID-19 can be contained by isolating and treating infected patients, according to 88.7 percent of nurses polled. Quarantine any individuals who come into contact with a COVID-19 virus-infected person immediately. The observation period should last an average of 14 days. COVID-19 prevention and control have a mean of 8.95, whereas general awareness about the spread is 21.8. Tadesse et al. (2020) also found that only 51.8 percent of all nurses are aware that universal medical masks can prevent the COVID-19 virus, which is in line with our findings. No action is needed by the 49 percent of children and adolescents who are well-informed about the COVID-19 virus. Only 47.7 percent of the general public and 50.6 percent of nurses are familiar

with the most efficient methods for preventing the transmission of the COVID-19 virus infection. The average observation period is 14 days. Seventy-four percent of nurses are familiar with COVID-19.

A majority of RNs (56.6 percent) were found to be knowledgeable about in order to stop the transmission of the COVID-19 virus, the general population can utilize medical masks, and 89.7 percent of nurses are aware of this fact. Preventative actions aren't necessary for the 95,5 percent of children and youth who have a thorough awareness of the COVID-19 virus. In order to prevent the spread of COVID-19, people should avoid public transportation and crowded areas like train stations. COVID-19 is well understood by 98.5 percent of healthcare workers; isolation and treatment are effective ways to prevent its spread. Individuals who come into contact with a COVID-19 virus-infected person should be quarantined in a safe location right away. At least 14 days are required to observe. According to a study by Arslanca et al. (2021), more than 96 percent of health care professionals believe washing hands and wearing a face mask are effective ways to protect themselves from the virus. 94.42 percent of nurses, according to Marthoenis and Maskur, are well-versed in the subject area. Only 4.55 percent of nurses are aware that the COVID-19 virus can be prevented by wearing a standard surgical mask. Most children and teenagers have a good grasp of the COVID-19 virus; therefore, they don't need to take any prophylactic precautions. Most people (98 percent) know that avoiding crowded settings like train stations and public transit is essential to avoiding the spread of COVID-19. Nurses are skilled at isolating and treating patients infected with the virus, which will help slow its spread (98 percent). Contaminated individuals should be isolated in a secure environment as soon as they are exposed to the COVID-19 virus. To be considered observable, a period of at least 14 days is required. Shawahna, (2021) found that 91 percent of nurses know that when used properly, medical masks can prevent the spread of infection. Ayed & Zabn, (2021) found that 59.2 percent of nurses have good knowledge about precautionary measures by health care providers. According to Paudel et al., (2021), only 83 percent of those surveyed were aware of the term. 74.5 percent of those polled know that the suggested time for hand washing with soap and water by the WHO is between 40 and 60 seconds. 83 percent of people are aware that the WHO-recommended time for rubbing alcohol-based hands is 10-20 seconds. 59 percent of respondents are aware that the WHO

recommends a distance of at least one meter between two people in order to prevent COVID-19. Ninety-two percent of those who must use N95 masks to avoid contracting COVID-19 are aware that 70% ethanol alcohol is utilized in disinfection to accomplish this goal. The survey found that 60 percent of nurses have a strong understanding of COVID-19.

According to Maurya et al., 98 percent of nurses are aware that the use of face masks inhibits the transmission of SARS-CoV-2. Only 56 percent of nurses were found to be knowledgeable about safe patient transportation in preventing the spread of COVID-19 (Wardani et al., 2022) in the study (Nurse Knowledge, Attitude, and Implementation). This is in accordance with what we found. It was found that 19 percent of nurses wash their hands with soap and water for at least 20 seconds each time they enter a public location (48 percent). To wash my hands after sneezing, coughing, or blowing my nose, I only use an alcohol-based hand sanitizer (60 percent of the responders). I avoid touching my eyes, nose, and mouth with my bare hands more than two-thirds of the time when someone is ill. For a limited time only (50 percent). I've always kept a respectable distance from people to keep myself safe. When I'm sick, I prefer to stay in bed instead of going to the doctor's office. When I cough or sneeze, I always use a tissue to cover my mouth and nose, and 70 percent of nurses do the same. When I'm feeling under the weather, I wear a face mask 70 percent of the time, clean and disinfect frequently touched surfaces 53 percent of the time, and clean filthy surfaces 50 percent of the time, all in accordance with regulations put in place following the COVID-19 outbreak. The age of 19 is a good time to engage in preventative behavior (32 percent).

This study found that nurses practice good COVID-19 prevention. According to Tadesse et al. (2020), 76 percent of nurses reported that hand washing with soap and water, as well as the use of face masks, were effective in preventing the spread of disease. Finally, 67 percent of nurses had good practices for infection prevention in relation to COVID-19.

Among nurses, 72 percent wash their hands for at least 20 seconds with soap and water after being in public, 39 percent wash their hands for at least 20 seconds after blowing their nose, coughing, or sneezing, and 58 percent use hand sanitizer containing at least

60 percent alcohol when soap and water are not readily available, according to Albaqawi and colleagues (2020). There is a 54.8 percent chance that you won't touch your face with your dirty hands (72.6 percent). In the poll, 59 percent of respondents admitted to constantly keeping their distance from others. Nurses use tissues to cover their mouths and noses when coughing or sneezing, and 67 percent of them never leave the house when they're sick unless they have to. Seventy-one percent of them never throw away used tissues. 57.3 percent of people said they would wear a facemask if they were ill. Clean and disinfect frequently touched surfaces on a daily basis (41.6 percent), 63.5 percent (and 77.4 percent), respectively, in accordance with government requirements during the COVID-19 outbreak.

Health care workers wear gloves and masks in 74 percent and 96 percent of cases, respectively, according to Arslanca et al., (2021). Nurses wash their hands and faces with soap or sanitizer in 91 percent of cases, prevent close contact with patients in 88 percent of cases, and wear PPE such as masks, gloves, and gowns in 96 percent of cases, according to Shawahna's (2021) findings (including COVID-19 patient). By washing their hands before and after interacting with patients, nearly all (92 percent) of nurses avoid and control COVID-19 (2021). 98 percent of people who follow COVID-19 prevention and control methods utilize alcohol-based hand wipes between each step when putting on PPE in order to prevent the spread of COVID-19. According to a survey, 87 percent of the nurses in your ward avoided personal contact with the COVID-19 patient or its surroundings (Maurya et al., 2022).

Nursing knowledge and preventive measures of the spread of COVID-19 is linked to the nurse's age. According to Wardani et al., (2022), knowledge is associated with age. This discovery was a part of ours. Nurses' actions in preventing the spread of COVID-19 are unrelated to their socio-demographic variables. There is a strong correlation between preventative behavior, education and gender, according to Arslanca et al., (2021). Preventive behavior was found to be significantly associated with age in Albaqawi et al. (2020). Our findings were at odds with this one.

6. CONCLUSION AND RECOMMENDATION

❖ Conclusion

The study finding concluded that:

In terms of clinical presentation, transmission route, prevention, and control, nurses are well-versed in COVID-19. When it comes to the dissemination of COVID-19, nurses are well versed. Nurses have an adequate level of preventive behavior related to the spread of COVID-19. Age, has a big effect on how much nurses know and preventive measures about how COVID-19 spreads.

❖ Recommendation

The study recommended that:

"Initiation of instructional sessions on the COVID-19 infection chain is critical." Collaborate with nurses to educate them on the 19 COVID preventive actions. Session to teach nurses how to use personal protective equipment. Follow up with nursing staff and evaluate their practice of hand washing and the use of masks, gloves, and other personal protective equipment.

REFERENCES

- Abd ElAziz, M. A., Abd Elhafez, N. G., Sayed, S. Y. 2021. Effect of Nursing Educational Program on Nurses' Knowledge and Practices regarding Pandemic Covid-19 in Isolation Unit. *Egyptian Journal of Health Care*, 12(4), 248-263.
- Ahmad, A., Alkharfy, K. M., & et al. 2020. Saudi Arabia, pharmacists and COVID-19 pandemic. *Journal of Pharmaceutical Policy and Practice* 13, 41
- Al Thobaity, A., & Alshammari, F. 2020. Nurses on the frontline against the COVID-19 pandemic: an integrative review. *Dubai Med J.* 3(3), 87–92.
- Albaqawi, H. M., Alquwez, N., & et al. 2020. Nursing Students' Perceptions, Knowledge, and Preventive Behaviors Toward COVID-19: A Multi-University Study. *Front. Public Health* 8, 573390
- Albaqawi, H. M., Alquwez, N., Balay-Odao, E., Bajet, J. B., Alabdulaziz, H., Alsolami, F., Tumala, R. B., Alsharari, A. F., Tork, H., Felemban, E. M., & Cruz, J. P. 2020. Nursing Students' Perceptions, Knowledge, and Preventive Behaviors Toward COVID-19: A Multi-University Study. *Frontiers in public health*, 8, 573390. <https://doi.org/10.3389/fpubh.2020.573390>
- Almohammed, O. A., Aldwihi, L. A., Alragas, A. M., & et al. 2021. Knowledge, Attitude, and Practices Associated With COVID-19 Among Healthcare Workers in Hospitals: A Cross-Sectional Study in Saudi Arabia. *Front. Public Health* 9, 643053. doi: 10.3389/fpubh.2021.643053
- Alrawashdeh, H. M., Al-Tammemi, A. B., & et al. 2021. Occupational burnout and job satisfaction among physicians in times of COVID-19 crisis: a convergent parallel mixed-method study. *BMC Public Health*. 21(1),811.
- Alsuwaidi, A. R., Al Hosani, F. I., & et al. 2021. Seroprevalence of COVID-19 infection in the Emirate of Abu Dhabi, United Arab Emirates: a population-based cross-sectional study. *International Journal of Epidemiology*, 50(4), 1077-1090.
- Al-Tamimi, M., Qaisieh, R., & et al. 2020. Successful flattening of COVID-19 epidemiological curve in Jordan. *JoGH*, 10(2), 1-6
- Alwani, S. S., Majeed, M. M., & et al. 2020. Evaluation of Knowledge, Practices, Attitude, and Anxiety of Nurses towards COVID - 19 during the Current Outbreak in Karachi, Pakistan. *Pakistan Journal of Public Health*, 10(2), 82-90

- Alzyoud, B., ALBashtawy, M., & et al. 2021. Nurses Knowledge Regarding Prevention Protocol of COVID-19 in Emergency Departments. *Medico-legal Update*, 21(3), 168-170
- Arslanca, T., Fidan, C., Daggez, M., Dursun, P. 2021. Knowledge, preventive behaviors and risk perception of the COVID-19 pandemic: A cross-sectional study in Turkish health care workers. *PLoS ONE*, 16(4), e0250017.
- Asfaw, N. 2021. Knowledge and practice of nurses towards prevention of hospital acquired infections and its associated factors. *International Journal of Africa Nursing Sciences*, 15, 1-5
- Ayala, A., Dintrans, P. V., Elorrieta, F., Castillo, C., & et al. 2021. Identification of COVID-19 Waves: Considerations for Research and Policy. *Int. J. Environ. Res. Public Health*, 18, 11058.
- Ayed, A. & Zabn, K. 2021. Knowledge and Attitude Towards COVID-19 Among Nursing Students: Palestinian Perspective. *SAGE Open Nursing*, 7, 1-5
- Belleza, M. 2021. Coronavirus Disease 2019 (COVID-19). Nurses labs. https://nurseslabs.com/coronavirus-disease-covid-19/#nursing_interventions
- Bhagavathula, A. S., Aldhaleei, W. A., Rahmani, J., Mahabadi, M. A., & Bandari, D. K. 2020. Knowledge and Perceptions of COVID-19 Among Health Care Workers: Cross-Sectional Study. *JMIR public health and surveillance*, 6(2), e19160. <https://doi.org/10.2196/19160>
- Bhargava, H. D. 2021. Coronavirus History. WebMD. <https://www.webmd.com/lung/coronavirus-history>
- Bugos, C. 2021. A Timeline of COVID-19 Vaccine Side Effects. Very weel health. <https://www.verywellhealth.com/when-to-expect-covid-19-vaccination-side-effects-5176621>
- Carrat, F., Touvier, M., & et al. 2021. Incidence and risk factors of COVID-19-like symptoms in the French general population during the lockdown period: a multi-cohort study. *BMC Infectious Diseases*, 21, 169
- Cascella, M., Rajnik, M., Aleem, A., et al. 2022. Features, Evaluation, and Treatment of Coronavirus (COVID-19). In: StatPearls [Internet]. <https://www.ncbi.nlm.nih.gov/books/NBK554776/>

- Corman, V. M., Landt, O., & et al. 2020. Detection of 2019 novel coronavirus (2019-nCoV) by real-time RT-PCR. *Euro Surveill.* 25(3), 2000045.
- Edwards, K. M., & Orenstein, W. A. (2022). COVID-19: Vaccines. Up to date. <https://www.uptodate.com/contents/covid-19-vaccines>
- Elasrag, G. A., Elsabagh, N. E., & et al. 2021. Impact of Educational Intervention on Nurses' Knowledge, Practice and Attitude Related Prevention Measures of COVID 19. *Indian Journal of Forensic Medicine & Toxicology*, 15(3), 2939-29-48
- El-Monshed, A. H., & et al. 2021. Nurses' knowledge, concerns, perceived impact and preparedness toward COVID-19 pandemic: A cross-sectional survey. *Int J Nurs Pract.* 27, e13017.
- Feachem, N. S. 2021. The United States' Response to COVID-19: A Case Study of the First Year. Institute for global health sciences. <https://globalhealthsciences.ucsf.edu/sites/globalhealthsciences.ucsf.edu/files/covid-us-case-study.pdf>
- Feleke, D. G., Chanie, E. S., & et al. 2021. Knowledge, attitude, and associated factors towards COVID-19 among nurses who work in South Gondar Zone, hospitals, Northwest Ethiopia 2020. A multi-central institution-based cross-sectional study. *New Microbes and New Infections*, 43, 1-12
- Fernandes, J. B., Vareta, D. A., & et al. 2022. Nursing interventions that humanise care for patients affected by COVID-19 in isolation units: An integrative review. *Infection, Disease & Health*, <https://doi.org/10.1016/j.idh.2022.03.001>
- Gambazza, S., Barger, S., & et al. 2021. Prevalence and associated factors of COVID-19 across Italian regions: a secondary analysis from a national survey on physiotherapists. *Archives of Physiotherapy*, 11, 30
- Gatto, M., Bertuzzo, E., & et al. 2020. Spread and dynamics of the COVID-19 epidemic in Italy: Effects of emergency containment measures. *PNAS*, 117(19), 1-8
- Gavi staff. 2020. There are four types of COVID-19 vaccines: here's how they work. Vaccines work. <https://www.gavi.org/vaccineswork/there-are-four-types-covid-19-vaccines-heres-how-they-work>

- Gebremeskel, T. G., Kiros, K., & et al. 2021. Assessment of Knowledge and Practices Toward COVID-19 Prevention Among Healthcare Workers in Tigray, North Ethiopia. *Front. Public Health* 9, 614321. doi: 10.3389/fpubh.2021.614321
- Han, X., Xu, P., Ye, Q. 2021. Analysis of COVID-19 vaccines: Types, thoughts, and application. *J Clin Lab Anal.* 35, e23937.
- Hashish, A. G., Eastaway, A., Sithole, B. L., Murthi, H. (2015). National Infection Prevention and Control Guidelines. <https://www.afro.who.int/sites/default/files/2017-05/ipcguide.pdf>
- Hetzler, L. 2020. Nursing Management of COVID-19. Every nurse. <https://everynurse.org/nursing-management-covid-19/>
- Huynh, G., Nguyen, T. N., & et al. 2020. Knowledge and attitude toward COVID-19 among healthcare workers at District 2 Hospital, Ho Chi Minh City. *Asian Pac J Trop Med*, 13, 260-5
- Kadhim, S. J., Saber, K. I. M., BARWARI, R. H. 2022. NURSES' AWARENESS AND EXPERIENCES DURING THE COVID-19 PANDEMIC IN DUHOK CITY. *Mosul Journal of Nursing*, 10(1), 82-88.
- Kang, L., Ma, S., and et al. 2020. Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: A cross-sectional study. *Brain, behavior, and immunity*, 87, 11–17.
- Karia, R., Gupta, I., Khandait, H., Yadav, A., & Yadav, A. 2020. COVID-19 and its Modes of Transmission. *SN comprehensive clinical medicine*, 1–4. Advance online publication. <https://doi.org/10.1007/s42399-020-00498-4>
- Kirubananthan, L., & et al. 2021. Mechanism and transmission routes of COVID-19. *Environmental Management of COVID-19*. doi: [10.1016/B978-0-323-85780-2.00013-5](https://doi.org/10.1016/B978-0-323-85780-2.00013-5)
- Leung, N.H.L. 2021. Transmissibility and transmission of respiratory viruses. *Nat Rev Microbiol* 19, 528–545. <https://doi.org/10.1038/s41579-021-00535-6>
- Li, Q., Guan, X., & et al. 2020. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia. *N Engl J Med.* 382(13),1199–1207
- Lima, C. M. 2020. Information about the new coronavirus disease (COVID-19). *Radiol Bras.* 53(2), 5-6

- Liu, Y., Kuo, R., & et al. 2020. COVID-19: The first documented coronavirus pandemic in history. *Biomedical Journal*, 43(4), 328-333
- Mahato, C., & Suryavanshi, S. 2020. Knowledge, attitude, and practices towards COVID-19 among nurses, ward attendants, and housekeeping staff at a tertiary psychiatric institute in India. *Int J Community Med Public Health*. 7(12), 5035-5043
- Mahdizadeh, SM., Sany, S.B.T., Sarpooshi, D.R. *et al.* 2021. Predictors of preventive behavior of nosocomial infections in nursing staff: a structural equation model based on the social cognitive theory. *BMC Health Serv Res* 21, 1187.
- Marthoenis, M., and Maskur, M. 2021. Knowledge, Attitude, and Practice of Nurses Toward COVID-19: A Cross-Sectional Study in a Referral Hospital of Indonesia. *Iran J Nurs Midwifery Res*. 26(6), 569–572.
- Maurya, N. K., Upadhyay, V., Dubey, P., & et al. 2022. Assessment of front-line healthcare workers' Knowledge, Attitude and Practice after several months of COVID-19 pandemic. *Journal of Healthcare Quality Research* 37, 20-27
- McCallum, K. (2020). COVID-19 Vaccines: What About Side Effects? Houston Methodist, Houston.
<https://www.houstonmethodist.org/blog/articles/2020/dec/covid-19-vaccines-what-about-side-effects/>
- McIntosh, K. 2020. Coronavirus disease 2019 (COVID-19). 1-29.
https://www.spg.pt/wp-content/uploads/2020/04/UpToDate_Coronavirus-disease-2019-COVID-19.pdf
- McIntosh, K. 2022. COVID-19: Epidemiology, virology, and prevention. Up To Date.
<https://www.uptodate.com/contents/covid-19-epidemiology-virology-and-prevention#H4056403748>
- Medhat, M. A., & El Kassas, M. 2020. COVID-19 in Egypt: Uncovered figures or a different situation? *JoGH*, 10(1), 1-4
- Mulabbi, E. N., & et al. (2021). The history of the emergence and transmission of human coronaviruses. *Onderstepoort J Vet Res*. 88(1), 1872
- Özdemir, Ö. 2020. Coronavirus Disease 2019 (COVID-19): Diagnosis and Management. *Erciyes Med J*, 42(3), 242–7

- Paudel, R., Shrestha, S., Gurung, L. 2021. Knowledge, Attitude and Practice Regarding Prevention and Control of Covid-19 Among Nurses of tertiary Care Hospital. *Journal of College of Medical Sciences-Nepal*, 17(2), 136-
- Paudel, R., Shrestha, S., Gurung, L. 2021. Knowledge, Attitude and Practice Regarding Prevention and Control of Covid-19 Among Nurses of tertiary Care Hospital. *Journal of College of Medical Sciences-Nepal*, 17(2), 136-144
- Priyadharishini, J. J., Terina, J. S., & Sadan, V. 2022. Knowledge, Attitude, and Practice Regarding COVID-19 among Community Health Nurses. *International Journal of Nursing Education*, 14(1), 73-79
- Quisao, E. Z., Tayaba, R. R., Soriano, G. P. 2021. Knowledge, attitude, and practice towards COVID-19 among student nurses in Manila, Philippines: Across-sectional study. *Belitung Nursing Journal*, 7(3), 203-209
- Rahman, H. S., Aziz, M. S., & et al. 2020. The transmission modes and sources of COVID-19: A systematic review. *International Journal of Surgery Open*, 26, 125-136
- Rosa, D., Villa, G., & et al. 2022. Tackling the Italian emergency 2019-nCoV: nurses' knowledge, attitudes and behaviors: What we know about the COVID-19?. *Acta Biomed.* 93(1), e2022010.
- Roy, D., Tripathy, S. , Kar, S. K. , Sharma, N. , Verma, S. K. , & Kaushal, V. 2020. Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian Journal of Psychiatry*, 51, 102083.
- Saha, A. K., Mitra, C. R., & et al. 2020. Nurses' Knowledge and Practices Regarding Prevention and Control of COVID-19 Infection in a Tertiary Level Hospital. *Bangladesh Journal of Infectious Diseases*, 7(2), 27-33
- Sahar, J., Kiik, S. M., & et al. 2020. Coronavirus Disease-19: Public Health Nurses' Knowledge, Attitude, Practices, and Perceived Barriers in Indonesia. *Open Access Maced J Med Sci.* 8(T1), 422-428.
- Said A. R. 2021. Knowledge and Practices of Nurses Regarding Corona Virus (COVID-19): An Educational Intervention. *Medico-legal Update*, 21(2), 36-47
- Saqlain, M., Munir, M. M., & et al. 2020. Knowledge, Attitude and Practice among Healthcare Professionals regarding COVID-19: A cross-sectional survey from

Pakistan.

<https://www.medrxiv.org/content/10.1101/2020.04.13.20063198v1.full.pdf>

- Schwartz, J., King, C-C., Yen, M-Y. 2020. Protecting healthcare workers during the coronavirus disease 2019 (COVID-19) outbreak: lessons from Taiwan's severe acute respiratory syndrome response. *Clin Infect Dis.* 71(15):858–60
- Sharma, A., Tiwari, S., Deb, M. K., & Marty, J. L. 2020. Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2): a global pandemic and treatment strategies. *International journal of antimicrobial agents*, 56(2), 106054. <https://doi.org/10.1016/j.ijantimicag.2020.106054>
- Shawahna, R. 2021. Knowledge, attitude, and use of protective measures against COVID-19 among nurses: a questionnaire-based multicenter cross-sectional study. *BMC Nursing*, 20, 163
- Shawahna, R. 2021. Knowledge, attitude, and use of protective measures against COVID-19 among nurses: a questionnaire-based multicenter cross-sectional study. *BMC Nurs* 20, 163 (2021). <https://doi.org/10.1186/s12912-021-00689-x>
- Shawahna, R. (2021). Knowledge, attitude, and use of protective measures against COVID-19 among nurses: a questionnaire-based multicenter cross-sectional study. *BMC Nurs* 20, 163. <https://doi.org/10.1186/s12912-021-00689-x>
- Shereen, M. A., Khan, S., & et al. 2020. COVID-19 infection: Emergence, transmission, and characteristics of human coronaviruses. *Journal of Advanced Research* 24, 91–98
- Tadesse, D. B., Gebrewahd, G. T., & Demoz, G. T. 2020. Knowledge, attitude, practice and psychological response toward COVID-19 among nurses during the COVID-19 outbreak in northern Ethiopia, 2020. *New Microbe and New Infect*, 38, 100787
- Tadesse, D. B., Gebrewahd, G. T., Demoz, G. T. 2020. Knowledge, attitude, practice and psychological response toward COVID-19 among nurses during the COVID-19 outbreak in northern Ethiopia, 2020. *New Microbes and New Infections*, 38I, 100787
- Vasireddy, D., Vanaparthi, R., & et al. 2021. Review of COVID-19 Variants and COVID-19 Vaccine Efficacy: What the Clinician Should Know?. *J Clin Med Res.* 13(6), 317-325

- Wardani, Y., Margaretha, S. E., and Prilliana, W. K., 2022. Nurse Knowledge, Attitude and Implementation of Safe Patient Transportation in Preventing the Spread of Covid-19. *The International Virtual Conference on Nursing, 2022*, 982–994
- Wen, X., Wang, F., Li, X., and Gu, H. 2021. Study on the Knowledge, Attitude, and Practice (KAP) of Nursing Staff and Influencing Factors on COVID-19. *Front. Public Health* 8, 560606.
- WHO. 2022. Iraq: WHO Coronavirus Disease (COVID-19) Dashboard. <https://covid19.who.int/region/emro/country/iq>
- World Health Organization. 2022. COVID-19 transmission and protective measures. <https://www.who.int/westernpacific/emergencies/covid-19/information/transmission-protective-measures>
- Yalman, F., & Sancar, T. 2021. Knowledge and attitude levels of nurses towards covid-19 in the second peak period of the novel coronavirus epidemic in Turkey. *Balikesir Sağlık Bilimleri Dergisi*, 10(3), 334-341.
- Yalman, F., & Tosun, N. 2022. Knowledge and Attitude of Nurses about the Current COVID-19 Outbreak in Turkey. *Int J Acad Med Pharm*, 4(1), 36-41
- Yang, Q., Wang, X., Zhou, Q. *et al.* 2021. Healthcare workers' behaviors on infection prevention and control and their determinants during the COVID-19 pandemic: a cross-sectional study based on the theoretical domains framework in Wuhan, China. *Arch Public Health* 79, 118 (2021).
- Yin, Y., Wunderink, R. G. 2018. MERS, SARS and other coronaviruses as causes of pneumonia. *Respirology*. 23(2), 130–137.
- Zhang, M., Zhou, M., Tang, F., Wang, Y., Nie, H., Zhang, L., & You, G. 2020. Knowledge, attitude, and practice regarding COVID-19 among healthcare workers in Henan, China. *The Journal of hospital infection*, 105(2), 183–187. <https://doi.org/10.1016/j.jhin.2020.04.012>
- Zhao, Z., Lan, X., Chen, Q., Li, C., Wang, T., Chen, X. and Yao, S. 2021. Nursing Care Management Strategies in Isolation Wards during the COVID-19 Outbreak. *Open Journal of Nursing*, 11, 249-257. doi: [10.4236/ojn.2021.114022](https://doi.org/10.4236/ojn.2021.114022).
- Zhu, N., Zhang, D., & et al. 2020. China Novel Coronavirus Investigating and Research Team. A Novel Coronavirus from Patients with Pneumonia in China, 2019. *N Engl J Med*, 382(8), 727–33



APPENDICES

APPENDIX 1. Board resolutions

APPENDIX 2. Questionnaire

APPENDIX 3. Research Committee

APPENDIX 4. Similarity Report



APPENDIX 1. Board resolutions





APPENDIX 2. Questionnaire





APPENDIX 3: Research Committee



CURRICULUM VITAE

SHAYMAA ODHAIB HUSSEIN

