Deanship of Graduate Studies
Al-Quds University

Knowledge, Attitudes, Perception, Practices, Psychological Factors and Coping Strategies among Healthcare Workers with Positive COVID-19 in the Gaza Strip

Dina Ahmed Ismail Abu Hamed

M. Sc. Thesis

Jerusalem- Palestine

1443 / 2021

Knowledge, Attitudes, Perception, Practices, Psychological Factors and Coping Strategies among Healthcare Workers with Positive COVID-19 in the Gaza Strip

Prepared By**:**
Dina Ahmed Ismail Abu Hamed

BSc. of Medicine and Surgery, Al-Quds Abu Dis University, Palestine

Supervisor: Prof. Abdelraouf A. Elmanama

Thesis Submitted in Partial Fulfillment of the Requirement for the Master Degree of Public Health- Epidemiology
School of Public Health – Al Quds University

1443 / 2021

Al-Quds University

Deanship of Graduate Studies

School of Public Health

Thesis Approval

Knowledge, Attitudes, Perception, Practices, Psychological Factors and Coping Strategies among Healthcare Workers with Positive COVID-19 in the Gaza Strip

Prepared by: Dina Ahmed Ismail Abu Hamed
Registration No.: 21812012

Supervisor: Prof. Abdelraouf A. Elmanama

Master thesis submitted and accepted. Date: 20/12/2021
The names of signatures of the examining committee members are as follows:

1. Head of committee: Prof. Abdelraouf A. Elmanama Signature.....
2. Internal examiner: Dr. Nuha Sharif Signature
3. External examiner: Dr. Motasem Salah Signature.....

Jerusalem- Palestine

1443 / 2021

Dedication

I have accomplished this challenging work by the grace of Allah the Almighty giving me strength and patience throughout the way to achieve it purposefully.

I would like to dedicate this master thesis to my real source of success; my great mother, Hanan, whom I am blessed to have as a mother, and to my extraordinary father, Ahmed, whom I go to when I need advice and consultation.

To my small family; my lovely soulmate husband, Mustafa, who always encourages and strengthens me to never stop, thank you for always being my backbone.

To my beautiful daughter, Naya, whose magical smile keeps me going every morning, thank you for inspiring me.

To my lovely brothers and sisters, Walaa', Hatem and Waleed; thanks for your guidance and endless support.

To my father-in-law, Ahmed, and my mother-in-law, Faten, thank you so much for your outstanding efforts.

To every teacher who taught me in school, in the Faculty of Medicine and the Public Health College, thanks for everything you have done for us.

To everyone who helped me finish my study, thank you from the bottom of my heart.

Dina Ahmed Ismail Abu Hamed

Declaration

I certify that this thesis is submitted in partial fulfilment of the requirements for Master Degree is the result of my own research, except where otherwise acknowledged, and that this study (or any part of the same) has not be submitted for a higher degree to any other university or institution.

Signature: ……

Dina Ahmed Ismail Abu Hamed

Date: 20/12/2021

Acknowledgement

First and foremost, I would like to praise Allah the Almighty, the Most Gracious, and the Most Merciful for His blessing given to me during my study and in completing this thesis. May Allah's blessing goes to His final Prophet Muhammad (peace be upon him), his family and his companions.

I would like to express my gratitude to my supervisor, Prof. Abdelraouf A. Elmanama, who has given me his guidance and advice to complete this thesis.

In addition, my greatest gratitude and appreciation are addressed to Prof Dr. Yehia Abed whose innovative methods of teaching made my academic journey an interesting one.

My great honor is also bestowed upon all academic and administrative staff in the School of Public Health at Al -Quds University for their invaluable knowledge and assistance they have given me, especially Dr. Bassam Abu Hamad, Dr. Khitam Abu Hamad.

Moreover, allow me to thank all my friends and all persons who helped me in completing this thesis and paved the way for my success.

I am also deeply thankful to my informants and the infected staff, who have taken part in completing this study. Without them, I wouldn't have done it.

Finally, I would like to thank everyone who was the reason behind making this work come to light.

Dina Ahmed Ismail Abu Hamed

Abstract

Background: COVID-19 epidemic causes dramatic losses in the lives of many health care workers. It has overwhelmed health system and health manpower. In addition, it causes heavy psychological burden on the medical staff.

Study aim: This study aims at identifying knowledge, attitudes, practices, psychological impact and coping strategies among healthcare workers who tested COVID-19 positive in the Gaza Strip. It is very important to gain better understanding of the difficulties they faced and identifying their top needs in order to promote their physical and psychological wellbeing with its positive effect on the society as a whole.

Methods: A quantitative method was used to collect the needed data from participants. It was performed through an online questionnaire; the study included a total of 389 of medical staff who agreed to fill in the questionnaire.

Results: Males represented 54.8% of the participants, 44% of them were 30-years-old and younger, 73.5% were married, 71.5% had Bachelor degree, nurses represented 50.1%, and 81.2% of the participants work in hospitals. The majority of participants (95.4%) had COVID-19 symptoms; the most common five symptoms were headache, fatigue, cough, muscle and back pain, and fever (86.5%, 85.2%, 76.6%,73.3%, and 72.5%, respectively). Loss of smell represented (68.5%), loss of taste (59.3%), sore throat (61.2%), runny nose (43.1%), shortness of breath (39.9%), chest pain (38.5%), diarrhea (46.1%), abdominal pain (32.1%), vomiting (14.3%), and rash (3.2%). Majority of study participants (81.0%) got supportive treatment at home, and 6.2% needed hospital admission. Sixty six percent received training on donning and doffing PPE properly, and 82.9% received formal training on infection control procedures. 52.6% said that these trainings were inadequate. Regarding risk factors, 10% were smokers, 12% were pregnant, 12.9% were obese, 8.5% were hypertensive, 4.9% were diabetic, 2.6% had respiratory disease, 2.6% had liver disease, and 1.5% had thyroid disease. The participants have an acceptable knowledge level with a mean score of 67.55 while the mean score of attitudes was 69.02. Practices of participants were very good with mean score 82.34. With regard to PPE adherence at work place, the mean adherence was 63.04. Nurses reported the highest score in practicing preventive measures. Male and Lab technicians were the highest in PPE adherence. ICU department was the most PPE adherent department. Female, nurses, health care workers in hospitals were the most anxious and depressed people. Results revealed the absence of relationship between blood type and severe COVID-19 infection.

On Depression, Anxiety, Stress Scale (DASS-21), the prevalence of depression among participants was 32.4% (17.5% mild, 14.1% moderate, 0.8% severe), anxiety was 54% (19% mild, 22.4% moderate, 12.6% severe) while stress prevalence was 33.7% (28.5% mild, 5.2% moderate). The study results show that transmission of COVID-19 infection to families was the most common source of anxiety and stress among infected staff (weighted mean= 80.2). Family support was the most common factor that contributed to reduce stress (weighted mean= 87). Most of participants adopted positive coping strategies during the infection period; spiritual and religious activities were the most common coping strategy (94.6%).

Conclusion: In light of these finding, it is recommended to implement advanced training programs on infection control procedures and PPE adherence. In addition, honoring medical staff properly for their efforts both morally and financially, and improving vaccination awareness campaigns. As well as, conduction of ongoing long- term programs for periodic education and psychological support sessions. Training psychologists on phone counseling is very important especially in crises. The study also recommends improving the coordination between the Ministry of Health and other ministries and improving the follow up system and evaluation system of psychological services**.**

Table of Contents

List of Tables

List of Figures

List of Annexes

List of Abbreviations

APA	American Psychiatric Association
ARDS	Acute Respiratory Distress Syndrome
BMI	Body Mass Index
CDC	Centers for Disease Control and Prevention
COVID-19	Coronavirus Disease
DASS-21	Depression, Anxiety, Stress Scale -21
DNA	Deoxyribonucleic Acid
FDA	Food and Drug Administration
GS	Gaza Strip
HCWs	Health Care Workers
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
ICU	Intensive Care Unit
KAP	Knowledge, Attitudes and Practices
MAP	Medical Aid for Palestinians
MOH	Ministry of Health
NIH	National Institutes of Health
NGOs	Non-Governmental Organizations
OR	Odds Ratio
PAHO	Pan American Health Organization
PCBC	Palestinian Central Bureau of Statistics
PCHR	Palestinian Centre For Human Rights
PHC	Primary Health Care
PPE	Personal Protective Equipment
RNA	Ribonucleic Acid
RT-PCR	Reverse Transcription Polymerase Chain Reaction
SARSCoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
SD	Standard Deviation
SPSS	Statistical Package for Social Science
UN	United Nations
UNDP	United Nations Development
UNRWA	United Nations Relief and Works Agency
WB	West Bank
WHO	World Health Organization

Chapter One

Introduction

1.1 Background

On December 31, 2019, a group of cases was diagnosed with unexplained pneumonia in Wuhan, China which was then identified as coronavirus 2019 disease (COVID-19) (Zhu et al., 2020). This highly infectious disease is caused by new virus, severe acute respiratory syndrome coronavirus 2 (SARSCoV-2), that belongs to large Ribonucleic acid (RNA) coronavirida family (WHO, 2020a). On March 11, 2020, about 118,319 confirmed cases and 4292 deaths of COVID-19 were reported globally. This rapid widespread of COVID-19 made WHO declare COVID-19 as a pandemic (WHO, 2020b). Thereafter, lockdown was imposed in many countries, which caused catastrophic implications on medical, social, economic and political aspects.

The first identification of COVID-19 in Palestine was in Bethlehem- West Bank, on March 05, 2020, after reporting seven cases due to contact with group of infected Greek tourists. On March 22, 2020, the Ministry of Health announced the first two cases of COVID-19 in the Gaza Strip who were coming back from Pakistan. On August 24, 2020, four family member cases were tested positive for COVID-19 at Al Maghazi refugee camp and this was the first spread inside Gazan society (MOH, 2020a). Lockdown was imposed completely and an escalating scenario of spreading started. Unfortunately, Palestinian healthcare system is weak in general, suffering from shortage in essential resources. Healthcare providers are under enormous pressure due to close contacts with infected persons as well as deficiency of personal protective equipment (PPE). These challenges may make health staff, the front-line fighters, anxious, stressed and depressed.

As of December 13, 2020, there were 70 million cumulative cases and 1.6 million deaths worldwide (WHO, 2020c). While in Palestine, total cases number reached 111,102 with 1107 deaths, 28,502 cases in Gaza Strip with 210 deaths, and 82,600 cases in the West Bank with 897 deaths (MOH, 2020b). Number of confirmed cases and deaths continue to increase all over the world. On October 31, 2021, the number reached 246 million cases and nearly 5 million deaths worldwide (WHO, 2021a). For sure, the number will also increase in Palestine; the total number of cases and deaths was nearly 455,491 and 4716

respectively on November 06, 2021 (MOH, 2021a). Unfortunately, the world is still facing this ferocious virus that takes hundreds of lives.

According to data collected from 19 countries in the Region of the Americas, about 569,304 of COVID-19 cases, including 2,506 deaths, have been documented among healthcare workers(PAHO and WHO, 2020).

On August 2021, a total of 39 countries and territories have reported 1,792,212 infected health care workers including 10,302 deaths (PAHO and WHO, 2021). Therefore, maintaining physical and psychological health status of medical staff must be a top priority for policy makers, as they the most crucial part in sustaining care for all citizens.

1.2 Problem statement

Any medical personnel with COVID-19 infection is considered a disastrous loss to the healthcare system. COVID-19 pandemic has overwhelmed hospital capacity, existing healthcare resources and health manpower. Loss of the workforce due to COVID-19 infection can lead to critical shortages and negative impact on patient care.

In developing areas such as Gaza strip, the possibilities of medical team infection might be higher, where medical resources are scarce and health problems are complex, PPE are not adequate for health staff (PCHR, 2020). Dealing with highly crowded area makes the situation worse.

This study aims to investigate the main characteristics of infected health staff, as well as, to evaluate their knowledge, attitudes and practices towards the virus, in order to determine critical gaps in these aspects. In addition to that, Psychological impact of COVID-19 infection would be determined trying to implement urgent actions that can ensure good health status for medical team in particular, and for all society in general.

1.3 Justification

Identifying knowledge, attitudes, practices and psychological impact among healthcare workers who got COVID-19 infection in the Gaza Strip is very important step especially in the absence of adequate published data. High prevalence of COVID-19 infection among health care providers raises concerns for many reasons such as, lack of knowledge, level of

commitment to infection prevention and control (IPC) standards, adherence to PPE, inadequate PPE, insufficient formal trainings, stress, work load, shortage of healthcare workers, and lack of trained staff.

A Palestinian local study has shown that health care workers in the occupied Palestinian territory appear to lack of PPE provision and well preparedness during COVID-19 pandemic; only 11.6% of HCWs dealt with COVID-19 patients with confidence, 41.3% have not received any COVID-19 related trainings and 41.3% don't have COVID-19 hospital protocol(Alser et al., 2021). So, PPE shortage and level of commitment to PPE, as well as, lack of proper trainings about dealing with COVID-19 patients and about proper PPE donning and doffing might shed light to and even might help in predictions about the future prevalence of COVID-19 infection.

When the gaps that present in their knowledge about COVID-19, and the gaps in their practices, are determined, immediate effective educational campaigns/courses are recommended. In addition, sufficient formal trainings to fill these gaps and enhance their practices should be conducted.

In the occupied Palestinian territory, high workloads, separation from families, death of some COVID-19 patients, lack of essential resources such as PPE and medicines, in addition to, pre-exciting compounding factors including social, economic and political context of occupation and blockade have caused collectively widespread stress, anxiety and depression among health care workers (MAP, 2021).

Policies and strategies can be developed based on data generated from this research to strengthen the healthcare system, and emergency plans, which help in maintaining the overall health status of society. This might help the community to recover faster from this disaster and compensate its losses in all affected aspects. This research will pave the way for other researchers to focus their researches on various aspect of this vital field.

1.4 Aim of the study

The aim of the study is to identify knowledge, attitudes, perception and practices of health staff who tested positive for COVID-19 in the Gaza Strip since the beginning of the epidemic, as well as, determining the psychological impact of COVID-19 infection and the coping strategies adopted by healthcare workers to get better understanding of the

challenges they faced and help in providing recommendations that might promote health care providers wellbeing with its positive consequences on the society.

1.5 Research objectives

-To describe the main characteristics of health staff who tested COVID-19 positive.

-To identify the course of COVID-19 infection among medical staff.

-To assess the major gaps among health staff knowledge, attitudes and practices towards COVID-19 epidemic.

-To identify the psychological impact of COVID-19 infection on health staff.

-To recognize the most common coping strategies adopted by health staff.

-To determine the relationship between COVID-19 infection and blood group.

1.6 Research questions

1- What are the main characteristics of COVID-19 infected health staff that contributed to infection (the highest proportion of age group and gender)?
2- Which health profession with higher risk of COVID-19 infection?
3- What are the most common symptoms of COVID-19 among infected health staff?
4- What are the most common co-morbidities associated with COVID-19 infection?
5- What is the proportion of vaccinated infected staff?
6- What are the reasons for COVID-19 vaccine refraining?
7- What are the most common misconceptions in health staff knowledge about COVID-19 infection?
8- How was the preventive practices and PPE adherence among infected staff?
9- What is the prevalence of depression, anxiety and stress among COVID-19 infected health staff?
10- What are the main sources of stress during COVID-19 infection that affect their psychological status?
11- What are the main factors that contribute to reduce stress?
12- What are the effective coping mechanisms they were adopted to overcome the stressful situation?
13- Is there a relationship between demographics and knowledge, attitude and practice of medical staff?

14- Is there a relationship between demographics and PPE adherence?
15- Is there a relationship between demographics and occurrence of depression, anxiety and stress?
16- Is there a relationship between blood type and COVID-19 infection?

1.7 Context

1.7.1 Demographic context:

Gaza Strip is considered one of the most densely populated areas in the world. It is located in the southern part of Palestine; the country that has been occupied many times and still occupied.

The registered populations in Palestine was about 5 million in mid-2019, 1.99 million in Gaza Strip with population density 5453 persons/km^2, and 2.99 million in West Bank with population density 528 persons/km2. The age group (0-14) constitutes about 38% of the total population while the age group (65 and above) represents the lowest one which constitutes 3% of the total population (PCBS, 2019a). The predictable number of Gaza Strip population is going to be 4.8 million in 2050 (Courbage, Abu Hamad, Zagha, 2016). Gaza Strip composed of five governorates; North Gaza, Gaza, Middle Zone, Khan Younis and Rafah.

The above-mentioned details show that the high population density of Gaza Strip is accelerating COVID-19 spread rapidly, and it also increase the expectations of high prevalence rates of spread.

1.7.2 Economic context:

Gaza Strip suffers from high level of poverty and extreme poverty associated with significant increase in unemployment rates, it reached 44% in 2017 while, in 2018, this percentage rose to 52% (PCBS, 2019b). Indicators show that 67.1% of Gaza's population live below the poverty line, while 21.1% are below the extreme poverty line (Courbage, Abu Hamad, Zagha, 2016).

This deterioration in the economic conditions is a result for "Israel "occupation which exposes Palestinians to recurrent wars and the strict siege that prevents importing and exporting, and damages all commercial, social, economic, and tourist aspects.

The bad economic situation negatively affects the psychological and nutritional status of citizens. This poor economic situation makes imposing complete lockdown very difficult despite increasing number of cases, as there is no steady income for most of the Gazans.

1.7.3 Health context:

The Palestinian health care system consists mainly from four healthcare providers: the main one is Ministry of Health which provides all types of health services primary, secondary and tertiary. According to primary health care, there are 472 primary health clinics (PHC), 54 in Gaza Strip and 418 in West Bank. For secondary health services, the total numbers of hospitals are 82 with 6440 total beds number, 52 hospitals in WB with 3897 beds (1.33 per 1000 population), and 36 hospitals in GS including 14 governmental hospitals with 2543 beds (1.32 beds per 1000 population) (PCBS, 2018). The second health provider is United Nations Relief and Works Agency that provides primary health services and health promotion programs; which operates 64 PHCs; 22 in GS and 42 in WB. In addition to that, some secondary health care services are purchased and provided for the needed cases. Non-governmental Organization (NGOs) is the third provider which provides all types of services depending on funds; it runs 80 PHC centers in GS. The fourth one is the private sector which has many health institutions and provides paid services at three levels (MOH, 2016).

At the Ministry of Health in Gaza Strip, there is 9.6 physician per 10000 population, and16.2 nurse per 10000 population. Number of beds increased to 2616 beds in governmental hospitals, and intensive care beds are about 221 bed divided as following: (37 general, 29 cardiac, 3 burn, 28 pediatrics, 124 premature infants) while the general intensive care beds were increased to 150 bed during COVID-19 epidemic (MOH, 2021b).

Unfortunately, Palestinian health care system is a fragile system facing many challenges and gaps. It suffers from many problems like shortage of medicines and medical equipment, as well as, the recurrent electricity cutoff as a result of Israeli occupation.

Many patients are forced to travel abroad for treatment. Movement restrictions as a result of siege is another obstacle for many patients (PCHR, 2020).

The situation is expected to be worse during COVID-19 epidemic. MOH announced that there is a shortage in 45% of the drug list, 31% of medical consumables, and 65% of laboratory materials and blood banking supplies. MOH urgently asked for more testing kits, intensive care units, respirators, drugs and PPE to fight the epidemic. The continued power outage negatively affects all health system components especially laboratories. During COVID-19 epidemic, lack of fuel affected the operational capacity of laboratory devices, and therefore, the accuracy of results because of using electronic generators as an alternative source and the unsuitable temperature for sample and vaccine storage. The severe insufficiency of the testing kits, primary laboratory supplies and PPE put health staff in front are huge challenges and higher risks (UN, 2020).

Many procedures and actions were taken by MOH in cooperation with the world health organization (WHO) office in Gaza and other health care providers to fight COVID-19 epidemic in the Gaza Strip; including determination of many respiratory triage points at five schools near the major five hospitals in the five governorates; Indonesian hospital in the North (Hamad School), Al-Shifa hospital in Gaza(Al-Karmel Hospital), Al-Aqsa hospital in the Middle (Al- Manfalooty School), Nasser hospital in Khan Younis (Abd Al-Kader AL-Hossini School), and Al-Najar hospital in Rafah(Beersheba school) (MOH, 2020c).

In addition to that, Turkish Friendship Hospital (TFH) and The European Gaza Hospital (EGH) were transformed into COVID-19 facilities where the confirmed cases are being isolated, treated and followed-up. A new department at Al-Shifa Complex was allocated for COVID-19 patients divided into suspected patients' section and confirmed patients' section with special intensive care unit for COVID-19 severe cases (MOH, 2020c). Many quarantines were prepared to serve COVID-19 patients such as:

Rafah Crossing Hospital

It was prepared to receive COVID-19 confirmed cases for patients coming from Rafah Crossing, and provide care for them with a capacity of 35 beds and 6 intensive care beds, as well as allocating medical staff to work at the hospital (MOH, 2020c).

European Gaza Hospital

The European Gaza Hospital (EGH) is considered one of the main hospitals in Gaza Strip. It is located south of the Gaza Strip in Khan Younis on a land area 65 dunums. Its establishment started in 1993 but the fund was ended. On July 1999, an international team worked with local Arab team in the hospital, which was completed in October 2000 with a total 240 beds (MOH, 2009). During COVID-19 epidemic, Gaza European Hospital, which is well-equipped and completely self-reliant hospital, was prepared with 400 beds to receive moderate and severe cases. (MOH, 2020c)

Palestine-Turkey Friendship Hospital

The Palestine-Turkey Friendship Hospital, which built by Turkish Cooperation and Coordination Agency (TİKA) in the Gaza Strip in 2017, consists of 180 rooms, 4 operating rooms, 26 intensive care beds, and laboratories. It was transformed to COVID-19 center on March 30, 2020 which reduces the burden on the health system in Gaza Strip (MOH, 2020c).

Quarantine centers

A quarantine center has been established in Rafah (500 rooms), another one was built in Beit Hanoun (500 rooms). In addition to that, 9 hotels and 16 schools were equipped, many resorts and buildings were also prepared to provide services to positive cases (MOH, 2020c).

Special quarantine departments in all hospitals in the Gaza Strip

Quarantine departments have been prepared in all governmental hospitals to receive suspected cases and conduct sampling for PCR test, as well as to receive COVID-19 cases transferred from quarantine centers (MOH, 2020c).

1.8 Operational Definition

Personal protective equipment (PPE)

PPE is an equipment used to reduce hazards of infection at the work environment.

PPE may include items such as face masks, gloves, face shield, full body suits, goggles, shoes, helmets, respirators and vests.

Suspected COVID-19 cases

The suspected case is a person who suffer from clinical criteria which include sudden onset of both fever and cough; or acute onset of three or more of the following symptoms: Fever, cough, fatigue, muscle weakness, shortness of breath, headache, sore throat, runny nose, gastrointestinal symptoms like anorexia, nausea, vomiting, or/and diarrhea, and altered mental status (WHO, 2020h).

Probable COVID-19 case

The probable COVID-19 case is defined as a patient who has clinical criteria which previously mentioned and has a contact with a probable; or confirmed case. It also applied on a suspected case with chest imaging that show suggestive signs of COVID-19 infection, in addition to a patient with recent loss of smell or/and loss of taste with absence of other causes (WHO, 2020h).

Confirmed COVID-19 cases

The confirmed case is a person with a positive Reverse transcription polymerase chain reaction test (RT-PCR) (WHO, 2020h).

Incubation period

The incubation period describes the time from a person’s first exposure to COVID-19 virus until the appearance of the first symptoms of COVID-19 infection.

Clinical health staff

Clinical health staff are medical people who work directly with patients and have responsibilities related to diagnosis and treatment.

Chapter Two:

Literature Review

2.1 Conceptual framework

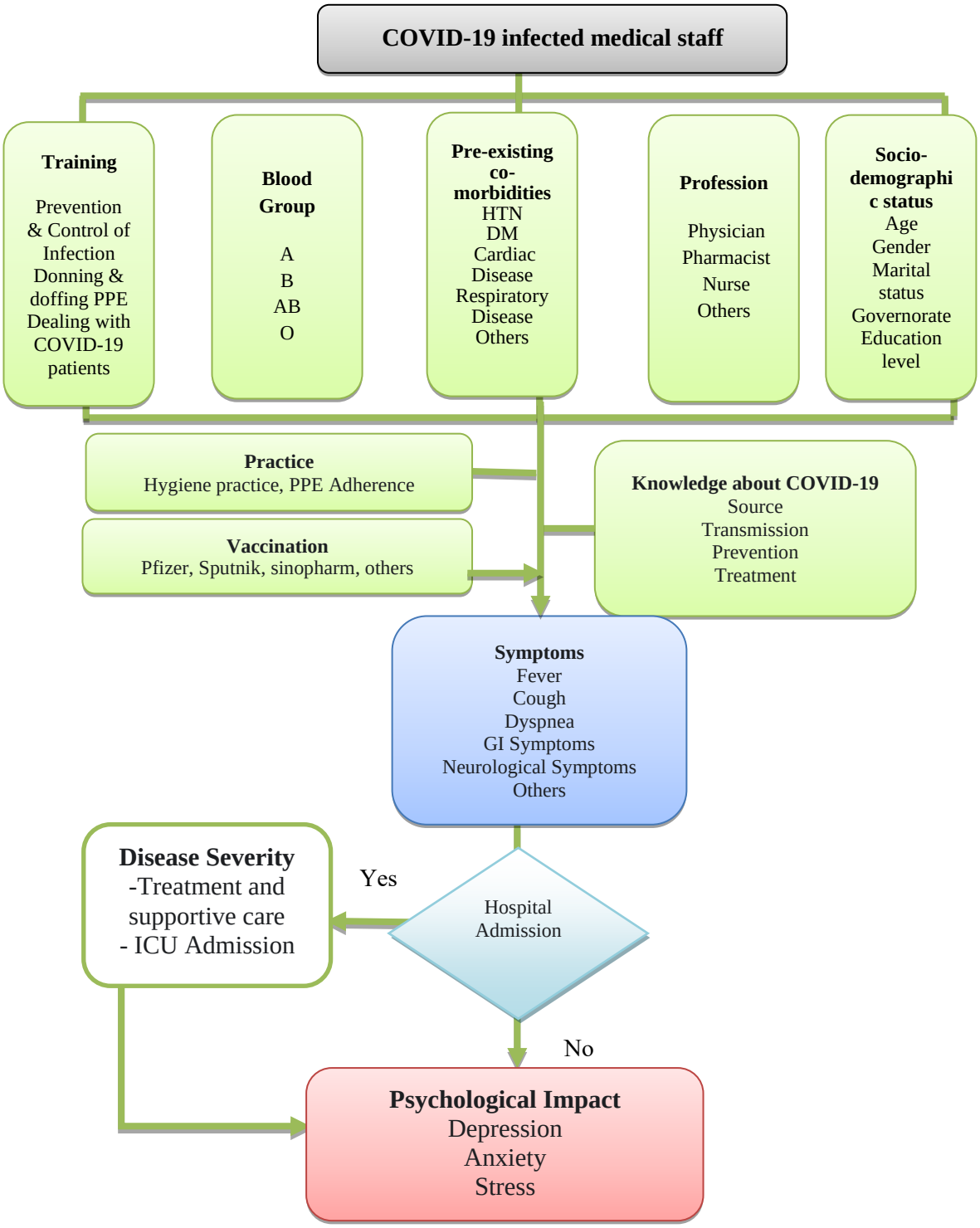


Figure (2.1): Conceptual framework

The framework consists of three groups. The first one includes the main characteristics of COVID-19 infected health staff that may contribute to infection including socio-demographic status; age, gender, marital status, governorate and education level, health professions, department, and pre-existing co-morbidities (diabetes, hypertension, cardiovascular disease etc…). Many studies enlisted that some blood groups are more vulnerable to COVID-19 infection than others. Lack of knowledge, hygiene malpractices and lack of commitment to PPE are reported as contributing factors to COVID-19 infection. Training on prevention and control procedures of infectious disease, donning and doffing PPE, and the proper way for dealing with COVID-19 patients are significant points that can affect the spread of the disease. COVID-19 vaccination plays a major role in reducing the disease severity and mortality rate. All these factors can affect the progress of the disease and its burden on patients, and therefore on the general psychological status.

The second group include the symptoms that health staff suffered from (respiratory, gastrointestinal or neurological symptoms) and the severity of those symptoms that leads to hospital admission.

The third group include the psychological impact of COVID-19 infection on health staff. Depression, anxiety and stress are the main mental domains that will be studied among infected health staff.

2.1.1 Depression

Depression is a common and serious mental disorder that negatively affects the way of feeling, the way of thinking, and the way of act. Depression characterized by persistent feelings of sadness and/or a lack of interest for previously enjoyable activities. It can lead to a variety of emotional and physical problems and can affect daily function at work and at home. Depression can cause change in appetite leading to weight loss or gain, and sleeping disturbance. It can lead to dangerous thoughts related to death and suicidal attempts. The causes of depression include complex interactions between social, psychological and biological factors. Some life events such as childhood adversity, loss and unemployment may help the development of depression (APA, 2020).

2.1.2 Anxiety

Anxiety is a normal reaction to stressful events which can be useful in some situations. It can help us prepare and pay attention to dangers. But, anxiety disorders differ from normal feelings of anxiety; it characterized by excessive fear or nervousness, feelings of tension, worried thoughts and physical changes like sweating, trembling, dizziness, rapid heartbeat and respiratory rates. People with anxiety disorders may avoid certain situations out of worry (APA, 2021).

2.1.3 Stress

Stress is our body' reaction to pressure. Dealing and coping with stress differ between people. It may depend on genetics, early life events, personality, social and economic circumstances. Stress hormones are produced in the stressful events triggering immune system and leave the person in fight or flight response; but quickly they return to normal level once the stressful event is over. However, too much stress can cause negative effects leaving the person in a permanent stage of fight or flight. Negative stress is defined as feeling of being overwhelmed or unable to cope with mental and emotional pressure (Mental Health Foundation, 2021).

2.2 Literature Review

2.2.1 Coronavirus Disease (COVID-19) and the causative agent:

Coronavirus disease (COVID-19) is an infectious disease caused by a virus called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) not identified in human, before, belongs to the Coronavirida family. It is s single-stranded RNA viruses that have a lipid envelope with club-shaped spike proteins which affects both animals and humans causing many illnesses and it is able to mutate rapidly (CDC, 2017; WHO, 2020d). Six human coronaviruses have been reported since 1960s; four of them cause mild illness, but the other two cause severe diseases with high morbidity and mortality rates, they were known as severe acute respiratory syndrome coronavirus (SARS-CoV) in 2003-2004, and the middle east respiratory syndrome coronavirus (MERS-CoV) in 2012 (Wu et al., 2020).

The disease and the virus have different names for many reasons; the virus is named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by the International Committee on Taxonomy of Viruses (ICTV) on February11, 2020. The reason for this nomenclature is its genetic structure that related to the coronavirus responsible for the SARS outbreak of 2003, but the two viruses are distinct. The main purpose is to make it easier for the scientists to develop diagnostic tests, vaccines and medicines. The disease is named coronavirus disease (COVID-19) by WHO in the International Classification of Diseases (ICD) on February 11, 2020. The disease is previously known as (novel coronavirus 2019). The purpose is to facilitate discussion of disease in different aspects; prevention, transmissibility, treatment and severity (WHO, 2020a).

There is a lot of controversy about the source of the new Coronavirus. During the early period, some claims that it is genetically engineered, but the genetic analysis and protein sequencing of SARS-CoV-2 have been studied by several scientists and the result confirms that this virus is natural with absence of any signs of manipulation in the genome data (Hayes, 2020). There was a consensus among researchers that bats were the reservoir of SARS CoV 2 (Zhou et al., 2020; Wacharapluesadee et al., 2021). However, the origin of the virus remains unclear.

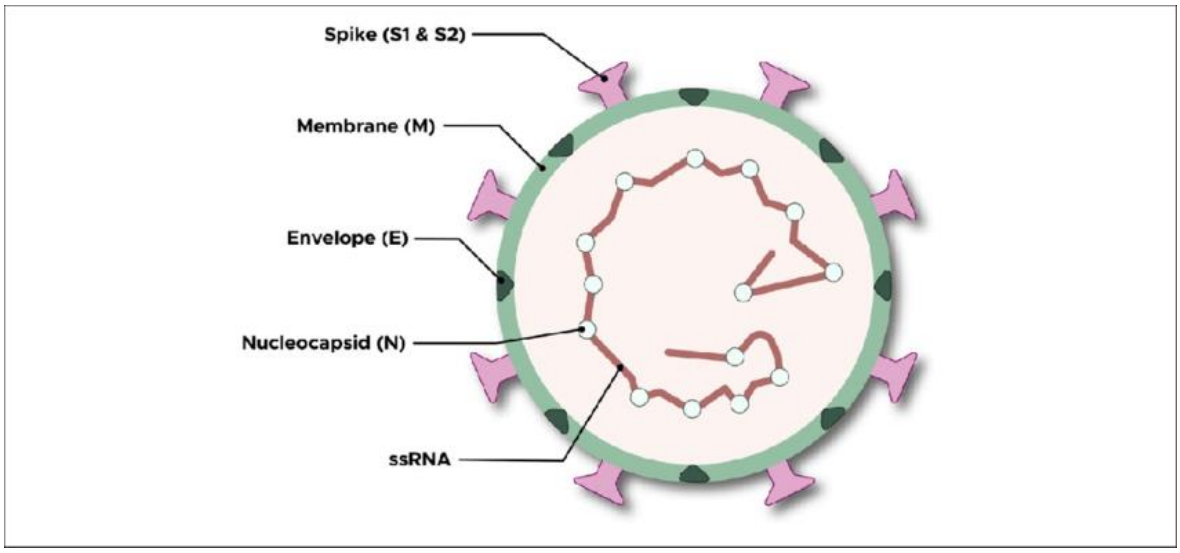


Figure (2.2): Schematic presentation of SARS CoV 2 virion

2.2.2 COVID-19 transmission:

COVID-19 infection transmits mainly through respiratory droplets; which are large particles (more than 5-10 micrometer). It rapidly transmitted to others who are in close contact (1m) with an infected patient suffering from respiratory symptoms (coughing, sneezing…). A single cough can throw off 3000 droplets. Droplet transmission may also happen through fomites in the surrounding environment. Thus, transmission of the SARS CoV 2 virus can occur by direct contact with infected people and indirect contact with touching infected surfaces. COVID-19 infection is also transmitted through airborne transmission (aerosol < 5μm) but in less proportion than droplet transmission, it results from the evaporation of larger droplets remaining in the air for long period and can spread over long distances (more than 1 m) (WHO, 2020e).

Although, the WHO confirmed that SARS CoV 2 can spread through contaminated surfaces and recommended all people to disinfect surfaces, the CDC reported that touching infected surfaces is not thought to be a common way for COVID-19 transmission (CDC, 2021a).

2.2.3 COVID-19 clinical manifestations:

Symptoms of COVID-19 vary among patients and range from no symptoms to mild and moderate symptoms without any hospital admission (about 81%), severe symptoms are about 14% and critical symptoms 5%. Severe illness includes patients who needs

hospitalization, intensive care, ventilator, or/ and a person who died as a result of infection (CDC, 2021b).

Symptoms of COVID-19 are mainly respiratory including fever, dry cough, shortness of breath and general weakness (CDC, 2020a; Wu and McGoogan, 2020). In addition, there are many gastrointestinal symptoms (nausea, vomiting, diarrhea), neurological and psychological manifestations (headache, loss of taste, loss of smell, loss of speech, loss of movement, stroke, encephalopathy, encephalitis, CNS vasculitis, neuro cognitive (dementia-like), psychosis…etc.) (Ellul et al., 2020).

About 152 publications with a total of 41,409 participants from at least 23 countries reported 26 different clinical manifestations; 6 symptoms had high prevalence rate (25% or above) include fever, cough, dyspnea, malaise, fatigue, and sputum production with prevalence rate 58.66%, 54.52%, 30.82%, 29.75%, 28.16%, 25.33% respectively. Other symptoms that reported were neurological symptoms, dermatological symptoms and anorexia which have almost the same prevalence rate (about 20%). myalgia had 16.9% prevalence rate. Sneezing, sore throat and rhinitis have close proportions (about 14 %), goosebumps (13.49%), headache (12.17%), chest pain (11.49%) and diarrhea (9.59%). The least one was hemoptysis (1.65%). In a study that included 100 patients, three main symptoms were documented (fever (57.93%), cough (54.21%), and dyspnea (30.64%)) (da Rosa Mesquita et al., 2021).

2.2.4 COVID-19 complications:

Immunocompromised people are the vulnerable group for serious complications; like elderly, and people with chronic diseases. COVID-19may lead to serious complications mainly in the respiratory system which present as pneumonia, acute respiratory distress syndrome (ARDS) and respiratory failure.

COVID-19 infection can lead to multiple organ failure like acute kidney failure, acute liver failure, septic shock and acute heart failure. In addition to that, secondary infection, and disseminated intravascular coagulation are dangerous consequences for COVID-19 infection. In addition, there are other complications as electrolyte imbalance (low potassium level), endocrine complications (pancreatitis, impaired glucose level), hematological complications (low platelet counts), neurological complications (ischemic

stroke, Guillain Barre syndrome), dermatological complications (rhabdomyolysis), and other life threating complications (Kordzadeh-Kermani et al., 2020).

2.2.5 COVID-19 risk factors:

As the COVID 19 pandemic is going wild, and acceleration of cases noticed, many studies conducted to clarify and point the major risk factors. These risk factors are as follows:

2.2.5.1 Socio-demographic factors:

Age, gender, ethnicity, marital status and employment status are considerable engaged factors for COVID-19 infection. Most of the study's findings collectively reported that elderly people are at higher risk of COVID 19 infection (Kahathuduwa et al., 2020; Rozenfeld et al., 2020). A dispute about gender as a risk factor, some studies show that males are more exposed to infection than females (Guan et al., 2020; Pullen et al., 2020; Colaneri et al., 2020), but some of them shows that females are at more risk (Maechler et al., 2020; Liu et al., 2020). In China, a study was conducted on 12, 647 COVID-19 confirmed cases from 30 provinces. The median age of all cases was 45 years and males had higher prevalence (52.0%) (Geng et al., 2021). A retrospective study in Jordan showed that the median age was 40 years for COVID-19 patients, and female had a higher prevalence (54.3%) (Samrah et al., 2020).

Ethnicity is an important predictor of COVID-19 risk; it is a complex factor composed of genetic predisposing, social structure, cultural habits, social and health behavioral patterns. Black and minority ethnic (BME) communities might be at increased risk of COVID-19 infection and poor outcomes. Specific ethnic groups, such as Black/African American race and Latino ethnicity are more likely than whites to get COVID-19 infection, as well as, South Asians are more prevalent for some comorbidities, such as diabetes, hypertension, and cardiovascular diseases, which make them more vulnerable for COVID-19 infection and increasing rates of mortality (Pareek et al., 2020).

A study showed that married and employed people are associated with higher levels of COVID-19 infection(Rozenfeld et al., 2020).

2.2.5.2 Life style:

Daily habits such as smoking, alcohol intake and physical inactivity are predisposing factors for COVID-19 infection. Smokers are 1.5 times more likely to have complications and had a higher mortality rate from COVID-19 (Alqahtani et al., 2020).

On the other hand, some studies reported that smoking was associated with a lower risk of developing COVID-19 infection but cannot be considered as a protective factor(Paleiron et al., 2021).

In general, alcohol consumption macerates the immune system in human bodies, thus it impairs its ability to resist COVID-19 infection. Exercising has a critical role in improving health status and minimizing stress; it prevents the main risk factors of COVID-19 infection like obesity and protects heart (WHO; UNDP, 2020f) .

Physical inactivity and the associated obesity are a major risk factors for COVID-19 infection. A study was launched in France, it reported that the odd of developing severe COVID-19 infection were seven times higher in obese people (Simonnet et al., 2020).

Forty-six studies investigated the impact of obesity on COVID-19 infection, obese patients had a noticeably increased risk of infection, developing severe symptoms, hospitalization , ICU admission and death from COVID-19(OR: 2.73, 3.81, 1.72, 2.25,and 1.61 respectively)(Cai et al., 2021).

2.2.5.3 Co-existing comorbidities:

There are many health comorbidities that increase the odds of developing severe COVID-19 infection and death; the odds for in-hospital deaths for people with type 2 diabetes were 2·03 (The Lancet Diabetes & Endocrinology, 2020). Hypertensive, cardiovascular and cerebrovascular patients are 2.3, 2.9 and 3.9 times more likely to promote severe symptoms, respectively (Wang et al., 2020). Chronic kidney disease, respiratory disease, cancer, dementia and HIV/AIDS infection increase risk of morbidity and mortality from COVID-19 considerably (CDC, 2020b). In the United States, the results of a study done on COVID-19 patients showed that adults with three or more underlying conditions have higher hospitalization rate (OR =5.0), in order ; severe obesity, chronic kidney disease,

diabetes, obesity, hypertension and asthma with OR (4.4, 4.0, 3.2, 2.9, 2.8, 1.4) respectively after adjusting for sex, age, and ethnicity (Ko et al., 2021) .

2.2.5.4 Pregnancy:

Pregnancy can increase risk of developing severe COVID-19 infection and occurrence of complications. To be pregnant during COVID-19 infection, it increases the risk of preterm labor and increase incidence of poor outcome (CDC, 2021c).

2.2.5.5 Environmental factors:

A crowdy cities and areas may make social distancing very hard which ease spreading of infection. Environmental factors are strongly related with socio-demographic factors, for example, more social contacts are noticed among married and employed people; employees may be forced to use public transportations then contact with large numbers of people and got infected easily (Rozenfeld et al., 2020). Highly polluted areas affect respiratory system and make people more unprotected from severe COVID-19 infection.

2.2.5.6 Health professions:

Health care workers are considered high risk group for COVID-19 infection. Many studies were conducted to determine the prevalence of COVID-19 infection among HCWs. On March 2020, more than 3300 infected health-care workers (4.4% of the total numbers) were reported in China with at least 22 deaths at a rate of 1.1% (Wang, Zhou, Liu, 2020). While in U.S.A, about 9200 HCWs were infected with COVID-19 on April 2020 (Burrer, 2020). High rate of COVID-19 infection among HCWs are reported in Italy (20%), and Spain (14%) with more than thirty deaths (Minder and Peltier, 2020).

In Qatar, between March 10 and June 24, 2020, about 1,799 HCWs were confirmed positive. Nurses and midwives had the highest prevalence (33.2% of all infected HCWs) followed by non-clinical support service staff (31.3%), administrative staff (14.6%), allied health professionals (12.7%), physicians (5.2%) and other clinical support staff (2.9%) (Alajmi et al., 2020). Other study confirmed that nurses represented the highest percentage of COVID-19 cases among HCWs (Al Thobaity & Alshammari, 2020). In Oman, a study with 126 COVID-19 infected HCWs, gave the following result: 18.1% above 45 years old, 72.2% female, 61.1% doctors and nurses, 53.2% worked in primary care institutions, 30.2% had chronic diseases, 29.4% had never trained on infection control procedure,

96.8% committed hand hygiene practice, 93.7% followed social distancing, and 96.9% wore protective facemasks (Al Abri et al., 2021). From a global perspective, a total of 152,888 infections and 1413 deaths were reported among HCWs. Infections were higher in women (71.6%) and nurses (38.6%), but deaths were higher in men (70.8%) and doctors (51.4%) (Bandyopadhyay et al., 2020).

Exposure to infected patients especially in high-risk departments are reported as an important COVID-19 risk factor among HCWs. High work load, associated with long-time exposure to infected patients, and working under pressure are considered a major risk factors for infection. Lack of PPE and improper donning and doffing of PPE are reported as an important risk factor for COVID-19 among HCWs (Mhango et al., 2020).

2.2.5.7 Blood groups:

During COVID-19 epidemic, many studies are conducted to investigate the relationship between blood group and progression of infection. The results showed that people with blood group A are more susceptible to COVID-19 infection, developing serious complications, admitting at ICU and death while the blood group O may be considered as a protective factor; because they reported the least prevalence rate (Silva-filho et al., 2020; Zhaoet al.,2020; Zhang et al., 2021). On the other hand, some studies demonstrated the absence of any association between blood groups and getting COVID-19 infection or developing severe infection (Boudin et al., 2020; Kumar et al., 2021).

2.2.6 COVID-19 diagnostic tests:

There are many types of tests for COVID-19 infection, for active infection; two viral tests are used: nucleic acid amplification tests (NAATs) including polymerase chain reaction test (PCR) which detects genetic material from different respiratory swabs like nasal swabs, nasopharyngeal swabs, oropharyngeal swabs, saliva and lower respiratory tract specimens can be collected in hospitalized patients. As well as, antigen test which detects specific proteins of the virus from nasal or nasopharyngeal swabs; its sensitivity is less than PCR. For past infection diagnosis, antibody test (serology test) is used; IgG antibody appears on 14 days after onset of symptoms (Cheng et al., 2020).

2.2.7 COVID-19 prevention:

Hygiene practices are the main preventive strategy against COVID-19 which are performed through washing hands regularly and properly (at least 20 seconds), using hand sanitizer, cleaning and disinfecting surfaces, avoiding touching face, covering nose and mouth during coughing and sneezing, maintaining social distancing (6 feet (at least 2 m)) from other people, and wearing mask in public places and avoiding eating and drinking in public places (Crowling and Leung, 2020).PPE are required for frontline staff who deal directly with COVID-19 patients, with sufficient training on the correct donning and doffing (CDC, 2020b). Additional studies are needed to verify the preventive effect of vitamin c and d, zinc, omega-3 fatty acid, and high fiber diet against COVID-19 infection (Gao et al., 2021).

2.2.8 COVID-19 vaccination:

Because of the increased COVID-19 cases and deaths, COVID-19 Vaccines Global Access Facility (COVAX) was developed. It is a global collaboration for acceleration the manufacturing of new vaccines, and aims to ensure equitable access to COVID-19 vaccines for all countries without any exception (WHO, 2021b) .

In the United States, three vaccines are approved for emergency use (Pfizer-BioNTech, Moderna, and Johnson & Johnson).

Firstly, Pfizer-Biontech vaccine is a messenger RNA (mRNA) vaccine; stored at freezer temperature. On December, 2020, it was the first vaccine to be authorized by FDA for emergency use. After 8 months, it is agreed to be used for people 16 years old and above. In mid-August, booster dose for immunocompromised people is recommended. 2 doses are required to give adequate immunity. Chills, headache, fatigue, and inflammation at the site of injection are common side effects for the vaccine. Anaphylaxis, myocarditis (inflammation of heart muscle) and pericarditis (inflammation of outer lining of the heart) are reported in rare post-vaccine cases as a side effect of vaccine. Its effectiveness for preventing symptoms is about 91.3%, and 95.3% for preventing severe symptoms. It is safe for people with pre-exciting health conditions, pregnancy and breastfeeding (FDA, 2021; Mayo Clinic Staff, 2021; KATELLA, 2021).

Secondly, Moderna vaccine is a messenger RNA (mRNA) vaccine like Pfizer; stored at freezer-temperature. On December, it is authorized for emergency use one week after Pfizer approval. It is used for 18 years old and above with 94% efficacy in preventing COVID-19 symptoms. It is safe for people with pre-exciting health conditions, pregnancy and breastfeeding (Mayo Clinic Staff, 2021; CDC, 2021d).

Thirdly, Johnson & Johnson's vaccine is a virus vector (carrier) vaccine; stored at normal refrigerator temperature. It is approved in February 2021 with only one-shot. The overall effectiveness is nearly 72% and 86% against severe disease. It is given for 18 years old and above. It has similar side effects to previous vaccines but may be milder. Few post-vaccine cases reported neurological complication like Gillian Barre Syndrome, and others reported blood clotting disorders (Mayo Clinic Staff, 2021; KATELLA, 2021).

Fourthly, Oxford-AstraZeneca vaccine is produced by United Kingdom; it is a carrier vaccine, it has the same character except it is cheaper and had additional side effects like low platelet count, blood clots and thrombosis that lead to death in few cases; Two doses are recommended with 60% efficacy against COVID-19 symptoms and 93% against hospital admission (WHO, 2021c).

Fifthly, Novavax vaccine is a protein adjuvant vaccine. which contains the spike protein of SARS CoV2. After injection, the immune system is stimulated to produce antibodies and T-memory cells. Other vaccines differ from Novavax that they stimulate immune system to produce spike proteins of the virus inside host cell (KATELLA, 2021).

Sixthly, Sinopharm vaccine is a Chinese, inactivated virus vaccine; authorized for emergency use. It is recommended for adults 18 years and older with two doses. Its efficacy rate is about 79% (Mayo Clinic Staff, 2021).

Seventhly, Russia's Sputnik V Vaccine is an inactivated adenovirus-bases vaccine with two doses. On November, 2020, it is authorized by Russia's National Research Center for Epidemiology and Microbiology for emergency use, before beginning phase III. On February 2, 2021, phase III was published with efficacy rate 91.4%. On May, 2021, another Russian vaccine is announced, but with a single dose called Sputnik Light; its efficacy rate is about 79.4% (Jones & Roy, 2021). The scientists are still racing in production several vaccines and there are many vaccines under evaluation.

A Palestinian study was conducted on 1159 HCWs, from December 25, 2020, to January 06, 2021, to examine the agreement of the COVID-19 vaccine by HCWs, and the causes of refusing vaccine; only 37.8% were intended to get vaccine, 31.5% were undecided, and 30.7% refused it, which was much lower than expected. Males, younger ages, physicians, HCWs at non-governmental institutions, those who previously got the influenza vaccine, and those who had higher COVID-19 knowledge level were reported higher levels of intention for COVID-19 vaccination (Maraqa et al., 2021).

2.2.9 COVID-19 management:

Mild symptoms are usually managed at home by isolation in a well-ventilated room. Supportive care includes fluid intake, antipyretics, pain relievers, and anti-cough syrup with no evidence that non-steroidal anti-inflammatory drugs as ibuprofen could worsen the disease. Antibiotics are of no value to treat COVID-19 as it is a viral cause.

WHO announced that there is no available treatment for COVID-19. Trials to use hydroxychloroquine as a treatment were stopped on 17 June 2020. Antiviral drug remdesivir was approved by the FDA to treat adult hospitalized patients. In addition, convalescent plasma therapy (plasma donated from recovered COVID-19) are approved to be used (WHO, 2020g).

Nowadays, WHO recommended casirivimab and imdevimab for treatment of COVID-19 patients which are monoclonal antibodies that targets spike protein of SARS-CoV-2. They are administered together by intravenous infusion (IV), helping COVID-19 outpatients to avoid hospitalization and reducing serious complications. They are not approved for COVID-19 hospitalized patients or on oxygen therapy. The effectiveness of these monoclonal antibodies is still under evaluation (FDA, 2020; WHO, 2021d).

2.2.10 Knowledge, attitude and practices of healthcare workers regarding COVID-19 infection:

Many studies have assessed knowledge, attitude and practices of HCWs during COVID-19 epidemic which have a significant impact on their behaviors and following the precautionary measures. A study in Dubai with 176 HCWs showed that health care organizations were the main source of COVID-19 information (91.5%). 57.4% of the participants reported sufficient knowledge level; the most satisfying answers were about

COVID-19 clinical manifestations. However, less than two thirds of the participants correctly answered the questions related to COVID-19 transmission, testing and the isolation of contacts with positive cases. Only 33% of the participants had a sufficient positive attitude and 88.6% of them reported acceptable infection control practices. Nurses HCWs reported higher attitude score (Albahri et al., 2021). Another study in Venezuela was conducted on 1,441 HCWs to assess their awareness, attitudes and practice regarding COVID-19 epidemic; the results showed that the main information sources were scientific literature (85.4%), colleagues (54.8%) and social networks (32.7%). 76.3% of HCWs had good knowledge, 53.6% had negative attitudes, and 76.9% reported appropriate practices. Poor knowledge was reported regarding virus name and proper use of PPE. More than half of the HCWs had not received COVID-19 training. 79.2% of the participants followed social distancing, 77.5% hand hygiene, and 51.8% used PPE(Mendoza Millán et al., 2021).

In the Palestinian Occupied Territory, a cross-sectional study was conducted on 455 nurses, in the period between October 2020 to December 2020, to assess their knowledge, attitude, and use of protective measures during COVID-19 pandemic; the mean was 75.7%, 75.1%, and 91.6%, respectively. The results showed that high knowledge was predicted by being female and high social status. Higher attitude was predicted by being female and high academic achievements. Higher use of protective measures was predicted by high academic achievements (Shawahna, 2021).

2.2.11 Psychological impact of COVID-19 on health care workers:

Health staffs are facing different sources of pressures due to high possibility of infection and subsequently the transmission to their families, increased workload, exhaustion, and isolation, lack of communication, frustration and shortage of PPE. This stressful situation causes many psychological problems like depression, anxiety, stress, anger, fear and insomnia. Protecting and treating mental health problems of health staff, caused by COVID-19 disease, is very important to maintain their wellbeing thus has a positive impact on controlling the epidemic (Kang et al., 2020). Many studies are conducted using different mental health scale assessment to highlight the psychological impact of COVID-19 on health staff. Most of studies showed that females and nurses have higher percentage of psychosocial problems than other groups. In China, a cross sectional study on 246 HCWs was conducted to clarify the psychological impact of COVID-19, using Self-Rating

Anxiety Scale (SAS). The result shows that anxiety is present in 23%, the rating as follows: 2.17% severe anxiety, 4.78% moderate anxiety and 16% mild anxiety (Huang et al., 2020). Another cross-sectional study was conducted on 1257 HCWs in China, using Generalized Anxiety Disorder Scale, Patient Health Questionnaire and Insomnia Severity Index. Depression was found in 50%, anxiety in 44.6%, insomnia in 34% and distress in 71.5% (lai et al., 2020). In Singapore and India, multi-national study was done on 906 HCWs, using Depression Anxiety Stress Scale (DASS-21) and Impact of Events Scale-Revised (IES-R). They found that 5.3% suffered from moderate to very-severe depression, 8.7% suffered from moderate to extremely-severe anxiety, and 2.2% suffered from moderate to extremely-severe stress (Chew et al., 2020). In Colombia, 15% of HCWs reported high score of Perceived Stress Scale Associated with COVID-19 (Pedrozo-Pupo, Pedrozo-Cortés, Campo-Arias, 2020). Depression, Anxiety and Stress Scale (DASS-21) was used in Pakistan on 276 HCWs to study their mental health. The frequency of depression, anxiety and stress was 10.1%, 25.4% and 7.3% respectively (Arshad et al., 2020).

A Palestinian study was adopted to study the main challenges among the Palestinian health care providers during COVID-19 pandemic; they confirmed that COVID-19 epidemic and quarantine negatively affects their mental health and their social relationships. The main challenges they faced include lack of adequate infrastructure, shortage of PPE, "Israeli" occupation and a shortage of HCWs in general, especially those who practice in specialty fields such as neurology, oncology, pediatric surgery and clinical psychology (Mahamid, Veronese, Bdier, 2021).Another qualitative study was performed to examine the impact of COVID-19 pandemic on the Palestinian HCW wellbeing and mental health; HCWs reported that they felt uncertain and unprepared during the pandemic, experiencing fear, anxiety, and concerns regarding their personal and family's safety. Social stigma and lack of recognition were reported as other sources of stress among Palestinian HCWs (MAP, 2021).

Adopting positive coping strategies can reduce stress among HCWs; a cross-sectional study from 32 countries was conducted to recognize the most common coping strategies adopted by COVID-19 infected HCWs. 72.4 % got family support, 70.8% adopted positive thinking, 58.4% practiced religious activities, 48.2% had adequate sleep and food intake, 27.5% watched TV, 27% had peer support, 17.7% learned new things, 11.2% were reading and 10.9% followed meditation(Htay et al., 2021).

Chapter Three

Methodology

This chapter describes the methodology used to conduct the study; which include the procedures followed by the researcher to obtain the relevant information and provides answers to research questions; including study design, study settings, study population, study sample, eligibility criteria, study instrument, data collection procedure, and data analysis. In addition to that, it describes the ethical consideration and the limitations that faced the researcher during conducting the study.

3.1 Study design

A descriptive, analytic, cross-sectional study design, with quantitative approach was adopted to evaluate knowledge, attitudes, practices, psychological impact and coping strategies among health staff who were tested positive for COVID-19 in the Gaza strip. The researcher chose this study design because it is an efficient, and enables the researcher to achieve the study objectives in a short time. In addition to that, it can investigate multiple variables at the same time. In this study, a structured online questionnaire was used to collect the needed data. The participants were asked to fill out demographic information about age, gender, residence, education level, and marital status. They were also asked about their health profession, department, chronic illnesses, formal training they received, vaccination, their knowledge about COVID-19, attitudes and practices during the epidemic; if they had followed the precautionary methods and committed to PPE properly, as well as, they were asked about the symptoms they had suffered from (If any), and the severity of their infection; if they needed admission or not; the psychological status during this stressful condition; thus, the researcher attempted to examine what were their fears and how did they manage these worries.

3.2 Study settings

The study was carried out in all centers and departments of MOH; including all governmental hospitals in the five governorates of Gaza Strip (Al-Shifa Hospital, European Hospital, Abu Yousif Al-Najjar Hospital, Al Aqsa Martyrs Hospital, Turkish Friendship Hospital, Indonesian Hospital, Beit Hanoun Hospital, Kamal Adwan Hospital, Nasser

Medical Complex, Emirates Crescent Hospital, Al-Nasser Pediatric Hospital, Al-Dorra Hospital, Al Rantisi Hospital and Psychiatric Hospital). The study included health staff from different departments such as internal medicine, surgery, obstetrics and gynecology, pediatric, special surgery, radiology, physical therapy, dental and psychology department. In addition to hospitals, primary health care clinics are included in the study with different levels.

3.3 Study period

The study has started after having the proposal approval from Al-Quds University, and after taking the ethical approval of Helsinki committee in February 2021. Then the instrument was designed and checked by experts in April 2021. Pilot study was conducted in May 2021. Data collection was delayed because the researcher needed two approvals; the first one was the general administrative approval from MOH through the Directorate General of Human Resources Development Directorate which was obtained in June 2021, and the second one was a special ethical approval for obtaining the personal data of COVID-19 infected medical staff which was taken in July2021. After that, Data collection was immediately started, and the study completed in December 2021. Annex 1 describes the study steps and the duration of each activity.

3.4 Study population

The study population included health staff who are working in different centers and departments of MOH and got infected with COVID-19; including physicians, nurses, pharmacists, dentists, lab technicians, radiologists, midwives, physiotherapists, psychologists, and every professional who provide service for the patients, since the beginning of the epidemic, where the estimated number of cases was around 2300.

3.5 Sample size

Using Epi Info for calculation sample size, with 95% confidence level, sample size was calculated as 329participants, and 389 questionnaires were collected. Annex2

3.6 Sampling process

Convenience sampling was used in this study. It is a type of non-probability sampling where the researcher sent the questionnaire to many health staff (conveniently available) to obtain the needed sample.

3.7 Eligibility criteria

3.7.1.1 Inclusion criteria:

All health care providers who were Reverse transcription polymerase chain reaction (RT-PCR) positive for COVID-19 infection of nasal and pharyngeal swap specimens, and work in governmental hospitals and clinics, as well as have spent the quarantine period are eligible to be included in the study.

3.7.1.2 Exclusion criteria:

1. Non-clinical health staffs are excluded.

2. Health staffs who are working in non-governmental sector are excluded.

3. Health staff who are retired, resigned and disapproved are excluded

4. Health staffs who are newly diagnosed (in quarantine) are excluded.

5. Probable and suspected cases among health staff are excluded.

3.8 Data collection and study instrument:

Questionnaire

The objectives of the study were achieved by designing a self-developed online structured questionnaire and sharing its link via Facebook and What App medical groups firstly. After that, the researcher sent the link to700health staff on their own WhatsApp account, and a total of 389 medical persons responded and filled in the questionnaire. The response rate was about 55.5%. The first page of the questionnaire contained an informed consent consisting of short explanation of the study objectives, ensuring confidentiality and voluntary participation. The study questionnaire included several items; which related to socio-demographic status, COVID-19 symptoms they suffered from, severity of the

disease, some risk factors of infection like smoking, blood group and pre-existing medical conditions, COVID-19 vaccination, their knowledge about COVID-19, hygiene practices and the level of commitment to PPE. It highlighted the formal training they had received to deal with COVID-19 and if it was sufficient to face this epidemic. Psychological status was studied during recognizing sources of stress and fear during the epidemic, and the coping strategies that might contribute in reducing this stress and worry. Depression, anxiety, and stress scale (DASS-21) was used to give general picture about the prevalence of depression, anxiety and stress among the infected health staffs.

DASS-21 is a validated screening tool consist of 21-item, which measures depression, stress and anxiety severity thresholds. Cut-off scores of > 4, >3 and > 7 represent positive depressive, anxiety and stress symptoms respectively. The questions in DASS-21 are ordered as following; questions 3, 5, 10, 13, 16, 17, and 21 represent the depression subscale, which is classified into mild depression (5-6), moderate depression (7-10), severe depression (11-13), and extremely-severe depression (>=14). Questions 2, 4, 7, 9, 15, 19, and 20 represent the anxiety subscale, which divided into mild anxiety (4-5), moderate anxiety (6-7), severe anxiety (8-9), and extremely-severe anxiety (>=10). Questions 1, 6, 8, 11, 12, 14, and 18 represent the stress subscale, the total stress scale is split into mild stress (8-9), moderate stress (10-12), severe stress (13-16), and extremely-severe stress (>=17) (Osman et al., 2012). Annex 3

3.9 Data entry and analysis

The quantitative data were entered and managed using the Statistical package for Social Science software (SPSS version 27); checking the collected data from errors as missing and inconsistent data, data entry, data cleaning, and data processing. Continuous variables were expressed by means, medians, standard deviations and categorical variables were displayed by frequencies and percentages. Some of variables required recoding and grouping. Association and significant differences between different variables were examined by using different statistical tests like Chi-square test (x2) when dependent and independent variables are categorical, T-test when dependent variable is continuous and independent variable are categorical (two groups), as well as, ANOVA test when dependent variable is continuous and independent variable are categorical with three groups or more. P-value equal or less than 0.05 is considered statistically significant for all associations. These statistical methods are used to facilitate final interpretation of data.

3.10 Scientific rigors

3.10.1 Validity:

For improving face validity of the questionnaire and smoothing the response of participants, the researcher organized the questionnaire very well, ordered the questions logically and made the words very clear. The questionnaire layout was reviewed and reformed several times to reach the final look.

Two methods were used to improve the content validity; Pilot study was conducted to assess the relevance of questions with the overall aim of the study, and expert reviews in which the questionnaire was sent to 10 experts in different specialties to review the questionnaire. They were asked to assess the questionnaire and provide their feedback about its relevancy to the study and accuracy of each part. Then the recommended modifications were added to questionnaire to improve its validity.

3.10.2 Reliability:

The following steps were done to assure reliability:

- Data entry was done in parallel with data collection which allow possible interventions to check data quality or to re-fill the questionnaire when required.
- Re-entry of 5% of the data after finishing data entry assured correct entry procedure and decrease entry errors.
- Cronbach's Alpha coefficient was used to measure the internal consistency of the questionnaire.

Domains	Cronbach's Alpha
COVID-19 Symptoms	0.770
COVID-19 risk factors	0.718
Medical staff Knowledge about COVID-19	0.749
Health staff attitude toward COVID-19 infection	0.600
Health Staff Practices during COVID-19 infection	0.878
PPE adherence at work place	0.800
Factors that cause stress and anxiety during COVID-19 infection	0.912
factors that contributed to reduce anxiety and stress during COVID-19 infection	0.813
DASS	0.816

3.11 Pilot study

Pilot study is a preliminary study conducted to test elements of the research before performing the actual data collection. The main purpose of piloting is improving the validity and reliability of the study. It was done by sending the questionnaire to 10 health care providers who recovered from COVID-19 and were asked to fill the questionnaire. Piloted COVID-19 infected medical staff and pilot key informants were not included in the study. The aim is to collect comments/feedbacks and modify the questionnaire in order to strengthen the study, and to obtain more precise results.

3.12 Ethical and administrative considerations

The researcher committed to all ethical and administrative considerations required to conduct this study. Ethical approval was obtained from Helsinki Committee (Annex 4). Administrative approval was obtained from School of Public Health at AL Quds University and Ministry of Health through the Directorate General of Human Resources Development Directorate (Annex 5). Official letters were sent to all governmental hospitals and primary health clinics. Informed consents were obtained from each participant (online) with emphasis on voluntary participation and confidentiality was maintained by removing any identifying data.

3.13 Limitations of study

- Sample size is limited according to available data at Ministry of Health.
- Limited time to conduct the study.
- The study is cross-sectional while COVID-19 epidemic situation is changing with time.
- Depression, Anxiety and stress (DASS-21) scale may be affected with different factors that present before COVID-19 epidemic such as low income, high poverty rate, and high unemployment rate.

Chapter Four:

Results and Discussion

4.1 Introduction

This chapter presents the statistical analysis of the data, including descriptive analysis of the socio -demographic characteristics of the study sample and the answers to the questions of the study. The researcher used frequencies, percentages, mean, median and standard deviation to analyze the questionnaire variables. The inferential analysis examines the relationship between selected variables and other selected covariates.

4.2 Socio-demographic characteristics of the study participants

4.2.1 Distribution of the study participants according to their personal data:

As shown in table (4.1), the distribution of participants according to gender was as follows; 54.8% males and 45.2% females. Regarding to age; 44.0% of the participants aged 30 years old and younger while 35.0% aged from 31 to 40 years old, the least age group was (older than 50 years) which represented 5.4% of all participants. Most of the participants were married (73.5%). Regarding to educational level; 71.5% had Bachelor degree, and 11.8% had diploma degree. Regarding to governorates; 34.4% live in Gaza while 20.1% live in Khan Younis, 19% live in the Middle, 14.7% in the North and 11.8% in Rafah.

Males represented larger proportion than females, maybe, because, at the beginning of the epidemic, the ministry's emergency plan relied mainly on males, especially in the high-risk positions, as the role of women in confronting the epidemic especially in quarantine places, was very limited because of their extreme fear. This finding fully agrees with the MOH report that reported 54.1% for males (MOH, 2021 b).

The young age group (30 years and younger) constituted the largest proportion;this result was near to CDC results (CDC, 2021e). This finding, may be, because the Palestinian society is a young society (PCBS, 2019a). In addition to that, the MOH aimed at employing a large number of newly graduated medical staff during COVID-19 epidemic. This finding is consistent with MOH results that reported 41% for 30 year and younger age group in the Gaza Strip (MOH, 2021c). Married people constituted a larger percentage.

This could be because the number of participants older than 30 years represented 55.4%, and usually, this age group is married, in addition to a number of those under 30 years old. Gaza was the highest governorate in the number of COVID-19 cases (34.4%), and the Middle was close to Khan Younis, but Rafah was the lowest (11.8%). This fully agrees with the MOH report (MOH, 2021b). The reason for this may be due to the large areas in Rafah and the low population number, as we noted that Rafah is the last governorate that the epidemic has reached. The bachelor's degree constituted the largest percentage (71.5%); this result was higher than a study finding in Saudi Arabia that reported 58% with bachelor degree (Almohammed et al., 2021). This finding, may be, because most of the jobs included in the study required a bachelor's degree, as 54% of MOH workers hold a bachelor's degree (MOH, 2020d).

Table (4.1): Distribution of the study participants according to their Personal data (N=389)

Items	**N.**	**%**
Gender		
Male	213	54.8
Female	176	45.2
Age		
30 years and younger	171	44.0
From 31 to 40 years	136	35.0
From 41 to 50 years	61	15.6
Older than 50 years	21	5.4
Marital Status		
Married	286	73.5
Not Married	103	26.5
Governorates		
North	57	14.7
Gaza	134	34.4
Middle	74	19.0
Khan Younis	78	20.1
Rafah	46	11.8
Educational Level		
Diploma	46	11.8
Bachelor	278	71.5
Master	38	9.8
Board	27	6.9

4.2.2 Distribution of the study participants according to their nature of work:

Table (4.2) shows the distribution of study participants' professional data. Half of the participants were nurses (50.1%). Physicians were 27.5%, Lab technicians (8%), pharmacists (4.9%), radiologists (3.1%) and other professions (midwife, physiotherapist, psychologist, dentist, Anesthesia technician) were 6.4%. Regarding the work place; 81.2% work in hospitals while only 18.8% in primary health care clinics (PHCs). 17.4% work in internal medicine, 15.5% in ICUs, 15.2% in surgery department, 14.8% in obstetrics and gynecology, 12.9% in COVID-19 medical unit, 12.5% in emergency and 11.7% in pediatric.

Regarding to years of experience, 34.3% had experience less than 5 years, 31.7% from 5 to 10 years, 18.2% from 11-15 years and 15.8% had experience more than 15 years.

Nurses constituted the largest percentage of COVID-19 cases which was close to study findings in China and Ethiopia (Chen et al., 2021; Hussen & Alemu, 2021), as nurses already represent the largest proportion of the total number of HCWs in MOH, followed by physicians (1.5 nurse per physician) (MOH, 2021b). Furthermore, nurses are the most people who have dealt with COVID-19 patients. The study shows that the number of infected staffs in hospitals is more than PHC, because HCW hospital number exceeds PHC in the MOH, as the number of hospital workers is 65.1%, while PHC is 16.4% (MOH, 2021b), as well as, hospitals have dealt with COVID-19 patients more than PHC. The percentage of low experience participants (less than 5 years) was the largest; this is consistent with the high percentage of young ages for the same reason that was discussed, which is the employment of a large number of newly graduated medical staff during the COVID-19 epidemic.

Table (4.2): Distribution of the study participants according to their nature of work

Items	N.	%
Job Title		
Physician	107	27.5
Pharmacist	19	4.9
Nurse	195	50.1
Lab technician	31	8.0
Radiologist	12	3.1
Others*	25	6.4
Work Place		
Hospital	316	81.2
PHCs	73	18.8
Department		
Internal medicine	46	17.4
Surgery	40	15.2
Obstetrics and Gynecology	39	14.8
Pediatric	31	11.7
Emergency	33	12.5
ICU	41	15.5
COVID-19 medical unit	34	12.9
Experience		
Less than 5	132	34.3
From 5 to 10	122	31.7
From 11 to 15	70	18.2
More than 15	61	15.8

*others: Anesthesia technician, Psychologist, Physiotherapist, Dentist, Midwife

4.3 COVID-19 infection

4.3.1 Study participants' response about COVID-19 infection:

According to participants' response, 64.8% provided direct care to COVID-19 patients, 27.4% of them worked in isolation department, 26.6% worked in isolation hospitals, 19.4% worked in intensive care units, 11.9% in triage tents and 9.5% in quarantines.

Regarding to the number of days worked with infected patients; 49.2% worked less than one month,25.0% of the participants worked from one month to 3 months while 25.8% worked more than 3 months, and the mean of worked days was 92.54.

According to COVID-19 symptoms; 95.4% of the participants were symptomatic, the most common three symptoms were; Headache (86.5%), fatigue (85.2%), and cough by 76.6%

(55% dry cough, 21.6% productive cough). Muscle and back pain represented (73.3%). 72%of participants presented with fever, 68.5% had loss of smell, and 59.3% had loss of taste. The participants suffered from other respiratory symptoms like sore throat, runny nose, shortness of breath, and chest pain, which represented (61.2%, 43.1% 39.9%, and 38.5% respectively). Gastrointestinal symptoms like diarrhea presented in 46.1%, abdominal pain in 32.1% and vomiting in 14.3%. Only 3.2% of participants suffered from rash.

According to course of disease, about 28.2% suffered from headache as the first symptom and 25.5% from back and muscle pain as the first symptoms, fever started in 15% as a first symptom. While 41.5% suffered from losing smell and taste as the last symptoms,11.8% reported diarrhea as the last symptom. Nearly half of the participant agreed with symptom disappearance from 8 to 14 days. The mean days of symptoms disappearance since the date of first symptoms was 13.61 days. According to severity of disease; 81.0% of the participants got supportive treatment at home and only 6.2% needed hospital admission.

This finding was consistent with a study in Kuwait reported 64.4% of the infected medical staff was in direct contact with COVID-19 patients (Al Youha et al., 2021).The most common COVID-19 symptoms result was close to CDC findings that fatigue, headache and muscle pain are among the most commonly reported symptoms among non-hospitalized patients (CDC, 2021b). Meta-analysis study shows that loss of smell was in 48.5% and loss of taste in 43% (Ibekwe et al., 2020). A study in U.S.A reported close results to our study for cough (82%), fever (67%), and dyspnea (45%) (Pullen. et al., 2020).The finding of gastrointestinal symptoms was within the range reported in a Chinese study; general gastrointestinal symptoms have been reported to vary between 3% and 79%, diarrhea was reported for 2% to 49.5% of patients, nausea and vomiting ranged between 1% and 29.4% in COVID-19 patients (Tian et al., 2020). A study reported 1% to 20% for dermatological symptoms of COVID-19 infection which was near to our study (Novak et al., 2021). The study finding of mean days of symptoms disappearance (mean=13.61)was close to study findings in New York (Ganz-Lord et al., 2021).The study result was consistent with CDC results that 81% of infected people have mild to moderate symptoms and don’t need hospital admission (CDC, 2021b).

The study finding that half of participants worked with COVID-19 patients less than one month, may be, because the ministry's policy at the beginning of epidemic was to work in quarantines for three consecutive weeks. After that, two weeks are recommended for staff isolation. Mean of working days with COVID-19 patients was 92.54, may be, because HCWs in isolation departments, isolation hospitals and ICUs who represented 73.4% worked with infected patients more than 3 months. The symptoms resulting in the study are consistent with the symptoms published by the MOH on its official page which include fever, cough, sore throat, vomiting, shortness of breath, and diarrhea. The study recommends extending the symptoms to include headache, muscle pain, back pain, fatigue, loss of smell and taste, abdominal pain, and dermatological symptoms, such as rash. 48.2% of participants reported disappearance of symptoms between 8-14 days; this coincides with the MOH recommendations, which is based on the CDC recommendations (CDC, 2021f). But, 22.4 % of the infected staff had symptoms that lasted more than 14 days, where the researcher recommends conducting a study on those cases and following up on any complications.

Table (4.3): Distribution of the study participants' response about COVID-19 infection

Items	N.	%
Provided direct care to COVID-19 patients?		
Yes	252	64.8
No	137	35.2
If yes, Workplace with COVID-19 patients		
Quarantine	24	9.5
Isolation Hospital	67	26.6
Isolation Department	69	27.4
Sorting Tent	30	11.9
Intensive care	49	19.4
Others (Working in the same place of my work)	13	5.2
Number of days you worked with infected patients		
Less than one Month	124	49.2
From Month to 3 Months	63	25.0
More than 3 Months	65	25.8
Total	252	100.0
Mean = 92.54 Days, Median 30.0 Days, SD = 141.38		
Having COVID-19 symptom		
Yes	371	95.4
No	18	4.6
Total	389	100.0
Type of Symptoms		
Headache	321	86.5
Fatigue	316	85.2

Table (4.3a): Continued

Muscle pain, back pain	272	73.3
Fever	269	72.5
Loss of smell	254	68.5
Chills	237	63.9
Sore throat	227	61.2
Loss of taste	220	59.3
Dry cough	207	55.8
Dizziness	199	53.6
Diarrhea	171	46.1
Runny nose	160	43.1
Shortness of breath	148	39.9
Chest pain	143	38.5
Abdominal pain	119	32.1
Cough with sputum	80	21.6
Numbness	59	15.9
Vomiting	53	14.3
Rash	12	3.2
Others (Problems in sleep, Vision-conjunctivitis, Un-focusing, Heart Problems, Bad Smell)	21	5.7
The first appearing symptom		
Headache	94	28.2
Back pain and muscle pain	85	25.5
Fever	50	15.0
Fatigue	41	12.3
Sore throat	25	7.5
Shortness of breath	16	4.8
Runny nose	10	3.0
cough	6	1.8
Diarrhea	3	0.9
Chest Pain	3	0.9
Total	333	100.0
The Last appearing symptom		
Losing smell and taste	141	41.5
Diarrhea	40	11.8
cough	37	10.9
Muscle pain	23	6.8
Multiple	19	5.6
Shortness of breath	17	5.0
Fatigue	15	4.4
Chest Pain	13	3.8
Runny nose	10	2.9
Headache	9	2.6
Rash	7	2.1
Dizziness	4	1.2
Vomiting	3	0.9
Sore throat	2	0.6
Total	340	100.0

Table (4.3b): Continued

When did the symptoms disappear since the date of first symptoms appearance		
7 days and less	100	29.4
From 8 to 14 days	164	48.2
More than 14 Days	76	22.4
Total	340	100.0
Mean 13.61, Median 10.00, SD = 11.80		
Infection severity		
Hospital Admission	24	6.2
Didn't need any treatment	50	12.8
Supportive treatment at home	315	81.0

4.4 Study participants and COVID-19 training

According to table (4.4),53.5% of the participants received formal training to deal with COVID-19 patients, and 66.4% received formal training on donning and doffing of PPE properly, and 82.9% received formal training for infection control procedures. 44.1% of the participants received one training, 31.5% received two trainings while 24.4% received three and more trainings. 52.6% of participants agreed that the training they had received to prevent infection was inadequate to prevent infection.

This findings were better than a study finding in Oman that 29.4% had never received IPC training(Al Abri et al., 2021). Other study in Kuwait showed that 75% of participants received infection prevention and control training , 57.7% had training for care of COVID-19 patients and 85.5% PPE donning and doffing (Al Youha et al., 2021).

The MOH conducted many trainings before and after the entry of the COVID-19 epidemic as part of its emergency plan. It trained 5,000 HCWs before the start of the pandemic, and many health staff members after the spread of the virus. Some of them were sponsored by MSF (Médecins Sans Frontières) Doctors Without Borders- Belgium (MOH, 2021d). However, half of participants said that these trainings were not adequate to prevent infection; this could be justified due to the fact that those trainings were short and quick. Also, it might be because of the great pressure that was imposed upon the MOH, and the rapid spread of virus. So, the COVID-19 trainings still need more planning and organization.

Table (4.4): COVID-19training among study participants

Items	N.	%
Received formal training to deal with COVID-19 patients		
Yes	205	53.5
No	178	46.5
Total	383	100.0
Received formal training on donning and doffing of PPE properly		
Yes	253	66.4
No	128	33.6
Total	381	100.0
Received formal training on infection control procedures		
Yes	316	82.9
No	65	17.1
Total	381	100.0
Number of trainings		
One	112	44.1
Two	80	31.5
Three and more	62	24.4
Total	254	100.0
Mean = 2.12, Median = 2.00, SD= 2.10		
Adequacy of trainings to prevent infection		
Yes	93	25.9
No	189	52.6
Not Sure	77	21.4
Total	359	100.0

4.5 Study participants and COVID-19 risk factors

According to table (4.5), 10% of the participants were smokers, and 3.3% of them smoking Nargila. 51.4% of the smokers smoke less than 10 cigarettes per day.12% of the female participants were pregnant during infection period. 33.2% of the participants with blood group (A), 31.6% have blood group (O), 20.6% have blood group (B), and 14.6% have blood group (AB). 12.9% of the participants are obese, 69.7% have no chronic diseases, 8.5% are hypertensive, 4.9% are diabetic, 2.6% have respiratory disease, 2.6% have liver disease, and 1.5% has thyroid disease.

A study in Oman reported 30.2% of infected HCWs had pre-existing health conditions (Al Abri et al., 2021) which was close to this study. Also, it was close to a study in Kuwait reported 37.9% of infected staff with at least one comorbidity; DM (6.9%), HTN(12.6%), and obesity (11.5%) (Al Youha et al., 2021).The finding of blood groups in this study was near to a study in China which reported 37.7% for group A, 26.5% for group B , and 10% for AB (Dzik et al., 2020).

The finding of low mean of cigarette number per day (mean= 2.76) may be due to the intense fear of the effect of smoking, and its relationship to the occurrence of serious complications with COVID-infection. Also, the study sample includes medical staffs who are aware of the risks of smoking on their health in general.

Table (4.5): Distribution of the study participants according to COVID-19 risk factors

Items	N.	%
Smoking status		
Smoker	39	10.0
Passive Smoker	30	7.8
Not Smoker	307	78.9
Smoking Nargila	13	3.3
Total	389	100.0
How many cigarettes per day		
Less than 10	18	51.4
From 10 to 14	8	22.9
More than 14	9	25.7
Total	35	100.0
Mean = 2.76, Median = 3.00, SD = 0.67		
Pregnancy during the infection period		
Yes	18	12.0
No	125	83.3
Not Sure	7	4.7
Total	150	100.0
Blood Group		
A	129	33.2
B	80	20.6
AB	57	14.6
O	123	31.6
Total	389	100.0
Regarding your health condition, which one do you have?		
None	271	69.7
Obesity	50	12.9
Hypertension	33	8.5
Diabetes	19	4.9
Respiratory disease	10	2.6
Liver disease	10	2.6
Blood disease	8	2.1
Thyroid	6	1.5
Cancer	3	0.8
Kidney disease	1	0.3
Cardiac disease	1	0.3
Others (cerebrovascular, immunological, neurological, endocrine…)	11	2.8

4.6 Study Participants and COVID-19 vaccination

According to table (4.6), 56% of the participants received COVID-19 vaccine at the time of data collection, 34% of those who refused vaccine because of having COVID-19 infection (unclear protocol for the period between the infection and receiving vaccine), 24.1% are not convinced with vaccine, and 17.3% have fears from vaccine side effects.

According to type of vaccine, 56.9% received Pfizer vaccine and 39.9% received Sputnik vaccine. 27.5% of the patients were infected after receiving vaccine; 36.7% were infected after the first dose of vaccine and 63.3% were infected after the second dose.

A Palestinian study showed 37.8% intention to get vaccine among HCWs, 30.7% rejection and 31.5% hesitancy about COVID-19 vaccine (Maraqa et al., 2021). In comparison to two study in the same period in August, 2021; the first one in China , which showed that 76.98% of healthcare workers accepted the COVID-19 vaccine, 18.28% workers were hesitant, and 4.74% workers were resistant (Wang et al., 2021) The other study in Egypt where the results showed 41.9% for hesitant HCWs, 32.1% for refusing, and 26% for willing(El-Sokkary et al., 2021)**.**

The resulting reasons of refusing vaccine may indicate that media and awareness campaigns of the MOH have not succeeded in convincing people to vaccinate and reduce vaccine hesitancy. Therefore, it is necessary to create new ways to convince people to get vaccine.

Table (4.6): Distribution of study participants according to COVID-19 vaccination

Items	**N.**	**%**
Received COVID-19 vaccination		
Yes	218	56.0
No	171	44.0
Total	389	100.0
If the answer is no, why didn't take the vaccine till now?		
COVID-19 infection	55	34.0
Not convicted	39	24.1
Fear	28	17.3
No reasons	14	8.6
Breast Feeding	13	8.0
Pregnancy	13	8.0
Total	162	100.0

Table (4.6a): Continued

Type of Vaccination		
Sputnik	87	39.9
Pfizer	124	56.9
Sinopharm	7	3.2
Total	218	100.0
Were infected with COVID-19 after receiving vaccine?		
Yes	60	27.5
No	158	72.5
Total	218	100.0
If yes, you were infected after the		
First dose	22	36.7
Second dose	38	63.3
Total	60	100.0

4.7 Sources of study participants' knowledge about COVID-19 infection

According to table (4.7), 96.1% of the participants had a previous information about COVID-19 before getting infection, 65% of the participants had information from medical centers and staff, 64.2% by virtue of their field of study and specialization, 55.6% from social media, and 56.6% from internet websites. According to conspiracy theory of COVID-19, 33.9 % said it is possible, 16.7% reported that it is a real conspiracy; 40% of those people who said yes, it is a conspiracy theory, believed that SARS CoV 2 virus is a biological weapon that was made in a laboratory on purpose, and 27.7% of them believed that SARS CoV 2 virus is a political game between major countries.

This finding was near to a study in Dubai that showed health organizations were the most common source of COVID-19 information (Albahri, 2021).

This may be due to the late arrival of the pandemic to the Gaza Strip compared to other countries, which prompted the medical staff to search and identify the virus before its arrival, as the disease has become an obsession for everyone. Moreover, the study sample includes medical staff, an educated class with scientific certificates. They are aware of the disease, and it is natural for the medical centers and their workplaces to be the most common source of information for them.

Table (4.7): Sources of study participants' knowledge about COVID-19 infection

Items	N.	%
Do you have previous information about COVID-19		
Yes	374	96.1
No	15	3.9
Total	389	100.0
If yes, what was the source of information (n = 374)		
Medical centers and staff	243	65.0
By virtue of the study and specialization	240	64.2
Internet websites	212	56.7
Social media	208	55.6
Scientific articles	191	51.1
Awareness flyers by the competent authorities	187	50.0
Radio, TV	134	35.8
Family and friends' discussions	90	24.1
Do you believe in the conspiracy theory regarding the COVID-19 infection		
No	192	49.4
Maybe	132	33.9
Yes	65	16.7
Total	389	100.0
If the answer is yes, which of these theories do you think is correct		
SARS CoV2 virus is a biological weapon that was made in a laboratory on purpose	26	40
SARS CoV2 virus is a purely economic war to manufacture and promote vaccines	15	23.1
SARS CoV2 virus is a political game between major countries	18	27.7
SARS CoV2 virus does not really exist	2	3
SARS CoV 2 virus appeared by mistake as the virus leaked from a Chinese laboratory	4	6.2
Total	65	100.0

4.8 Knowledge of study participants about COVID-19 infection

According to table (4.8), the mean score for knowledge section was 67.55(SD=15.35). The detailed data for each question summarized in a table (4.8) (Annex 6). This score was acceptable because some sentences are still under research; The majority of respondents knew that loss of smell and taste is a feature for COVID-19 infection (96.4%), 93.6% of the participants knew that the incubation period of COVID-19 is 1-14 days, 83.8%

answered that SARS CoV 2 virus is transmitted through respiratory droplets and touching infected surfaces. Additionally, 68% answered correctly that there is no effective cure for COVID-19 till the time of conducting this study. The sentence: Children don't have to wear medical mask and follow preventive measures (which is false) was answered correctly by 74%. These statements obtained the least scores: Hot weather reduces the spread of COVID-19 infection, Bats were thought to be the source of SARS CoV 2 virus, Prednisone should be given for all symptomatic patients even admitted or not and Herbal remedies like eating garlic, anise tea and ginger can prevent or treat COVID-19 infection were answered correctly by 61.7%, 53%, 44.7% and 32.1% respectively.

Respiratory droplets and touching infected surface are reported as the main mode of COVID-19 transmission (WHO, 2020e) Whereas some studies confirmed that touching infected surfaces are not a main source of infection transmission (CDC, 2021a). Regarding COVID-19 treatment, WHO recommended some monoclonal antibodies (casirivimab and imdevimab) for treatment of COVID-19 outpatients (WHO, 2021d). Bats were thought to be the source of SARS CoV 2 virus, but this thought is not confirmed yet (Zhou et al., 2020). Corticosteroid therapy for COVID-19 management has a conflicting result and there are some mis practicing from some physicians who gave corticosteroid for COVID-19 outpatients. Dexamethasone and other systemic corticosteroids are recommended for some hospitalized patients that can reduce mortality rate and duration of mechanical ventilation (NIH, 2021). Herbal remedies can strength immune system and sometimes work as antimicrobial but it doesn't prevent or treat COVID-19 infection (WHO, 2021e). So, many information in these questions are still under research, the researcher wants to highlighted the conflicting information about COVID-19.

This finding was higher than study findings in Dubai which showed that the mean score of knowledge was 11.78 with overall sufficient level of 57.4% of participants (Albahri et al., 2021).

Table (4.8): Knowledge of study participants about COVID-19 infection

Paragraphs	Yes		No		Don't Know	
	N.	%	N.	%	N.	%
Loss of smell and taste is a feature of COVID-19 infection	375	96.4	12	3.1	2	0.5
Incubation period of COVID-19 is 1-14 days	364	93.6	17	4.4	8	2.0
SARS CoV 2 virus is transmitted through respiratory droplets and touching the infected surfaces	326	83.8	55	14.1	8	2.1
There is no effective cure for COVID-19 till now.	267	68.6	85	21.9	37	9.5
SARS CoV 2 is thought to be originated from bats.	206	53.0	80	20.6	103	26.4
Children do not have to wear a medical mask and follow preventive methods	69	17.7	288	74.0	32	8.3
Hot weather reduces the spread of COVID-19 infection.	77	19.8	240	61.7	72	18.5
Prednisone should be given for all symptomatic patients even admitted or not	149	38.3	174	44.7	66	17.0
Herbal remedies like eating garlic, anise tea and ginger can prevent/treat COVID-19 infection	216	55.5	125	32.1	48	12.4
Mean = 67.55, Median = 66.67, SD = 17.06						

4.9 Health staff attitude and practices toward COVID-19 infection

4.9.1 Health staff attitudes toward COVID-19 infection

According to table (4.9), the mean score for attitude section was 69.02 (SD=18.09). Significant number of participants (86.4%) expressed positive attitude about face mask preventing COVID-19 infection with only 12.9% didn't agree that face mask prevents infection. The majority of participants disagreed that SARS CoV 2 virus is a simple virus and doesn't need any precautionary actions (90.2%). On the other hand, large number agreed that COVID-19 vaccine reduces the mortality rate and comprehensive closure is

effective in controlling the epidemic with 75.6%, and 70.4% respectively. 47.3% of participants agreed that COVID-19 vaccine protects from infection. However, COVID-19 vaccines don't provide full protection, many cases are infected even after the two recommended doses (WHO, 2021 f). 45.5% of them agreed that the governmental actions to face COVID-19 pandemic were appropriate in Gaza Strip.

This finding was better than a study results in Dubai which reported 33% for whom had sufficient attitude score (Albahri et al., 2021).

The educational bulletins and infection control trainings may have a great impact on educating people about the importance of the face mask in preventing disease transmission. The MOH is seeking to adopt vaccination according to the Food and Drug Administration recommendations (FDA, 2021). The government has taken many precautionary measures, such as total and partial closure, issuing many recommendations, holding awareness brochures, posters, infection control training, random surveys, and mobile vaccination clinics. The comprehensive closure had an effective role in breaking the cycle of the pandemic and preventing its spread.

Table (4.9): Health staff attitudes toward COVID-19 infection

Paragraphs	**Yes**		**No**		**Don't Know**	
	N.	**%**	**N.**	**%**	**N.**	**%**
I think face mask prevents the transmission of the virus	336	86.4	50	12.9	3	3.8
I think vaccination reduces the mortality rate from COVID-19	294	75.6	59	15.2	36	9.3
I think a comprehensive closure is effective in controlling the epidemic	274	70.4	83	21.3	32	8.2
I think vaccination protects from infection	183	47.3	179	46.3	25	6.4
I think that the governmental actions to face COVID-19 pandemic were correct and appropriate	177	45.5	172	44.2	40	10.3
I think SARS CoV 2 virus is simple and does not need any precautionary actions	29	7.5	351	90.2	9	2.3
Mean = 69.02, Median = 66.67, SD = 18.09						

4.9.2 Health staff practices during COVID-19 infection:

According to table (4.10), the mean score of practice among participants is very good and satisfied which equal 82.34 (SD= 12.37). The highest weighted mean scores were in favor of: using hand sanitizers, wearing medical masks and washing hands with water and soap with (93.4%, 91% and 90% respectively). 86.6% of the participants were dealing with every patient inside medical center that he has COVID-19 infection. Additionally, 83% of participants followed social distance while 81% were reading about COVID-19 and following up to dates. On the other hand, the social activities which were the most common source of COVID-19 spread had the lowest scores of practices including: avoiding participating in wedding and funeral homes, avoiding social visits and avoiding public markets with (78.8%, 74.6%, 73.8% respectively).

This finding was close to study conducted in Dubai where 88% of participants reported acceptable practices (Albahri et al, 2021). In Oman, the practice results were better: hand hygiene practice, social distancing and wore protective face masks represented (96.8%, 93.7%, 96.9% respectively)(Al Abri et al., 2021). In Pakistan the preventive practice results were lower: 55% of the participants went to crowded places during COVID-19 pandemic, and 45% used public transportation in the same period, 77%washing hands with soap and water, and 52% always committed with the most critical preventive practice against COVID-19 (Ahmad et al., 2020).

This may be due to the fact that most of the medical staff, by virtue of their studies, took the infection control course in universities, and the idea was enhanced as a result of the infection prevention and control trainings organized by the MOH. Social activities, although they obtained satisfactory percentages, they were the lowest among other practices, and this, may be, due to the traditions and customs of the Palestinian society, which necessitates the person, even if he is highly educated, to accept the invitations of others and be present in joyful and sorrowful occasions.

Table (4.10): Health staff practices during COVID-19 infection

Paragraph		Never	Rarely	Sometimes	Often	Always	Weighted Mean
Using hand sanitizers	N.	1	3	13	89	283	93.40
	%	0.3	0.8	3.3	22.9	72.7	
Wearing surgical mask	N.	0	5	27	92	265	91.80
	%	0.0	1.3	6.9	23.7	68.1	
Washing my hands with water and soap	N.	0	7	26	120	236	90.00
	%	0.0	1.8	6.7	30.8	60.7	
Dealing with every patient inside medical center that he has COVID-19 infection	N.	3	8	47	129	202	86.60
	%	0.8	2.1	12.1	33.2	51.8	
Following social distance at least 1 meter	N.	0	15	73	140	161	83.00
	%	0.0	3.9	18.8	36.0	41.4	
Reading about COVID-19 infection constantly and following updates	N.	3	24	75	120	167	81.80
	%	0.8	6.2	19.3	30.8	42.9	
Avoiding participating in weddings and funeral homes	N.	3	27	88	145	126	78.80
	%	0.8	6.9	22.6	37.3	32.4	
Avoiding social visits and visiting patients	N.	7	36	104	151	91	74.60
	%	1.8	9.3	26.7	38.8	23.4	
Avoiding public markets	N.	6	40	117	131	95	73.80
	%	1.5	10.3	30.1	33.7	24.4	
Wearing PPE (gown, face shield, goggles……)	N.	27	61	103	94	104	69.60
	%	6.9	15.7	26.5	24.2	26.7	
Mean = 82.34, Median = 84.00, SD = 12.37							

4.10 Study participants' adherence to PPE at work place

According to table (4.11), the overall mean of different PPE adherence among infected medical staff at their workplace was 63.04 (SD=12.63). Weighted mean of surgical mask adherence among infected medical staff was 95.6; 81.5% of them were always wearing surgical masks at their work place. Washing hands with water and soap after examining each patient for at least 20 seconds were committed by 93.6%; 75.8% of them were always washing hands at their workplace. 85.6% of the participants committed using hand sanitizers at workplace. Gloves were used by 80.4% of the participants. Disposable gown and face shield were used by 68.4% and 52.2% respectively. The least scores were adherence to goggles, cloth mask, N95 mask and full body suit with 42.8%, 41%, 36% and 35.2% respectively.

This finding was lower than Qatar, where full personal protective equipment (PPE) adherence was 82% at COVID-19 facilities and 68% at non-COVID-19 facilities (Alajmi et al., 2020).

This result may be due to the trainings organized by the MOH during COVID-19 epidemic regarding infection prevention and control, as well as, PPE donning and doffing.

Table (4.11): Study participants' adherence to PPE at work place

Paragraph		never	Rarely	Sometimes	Often	Always	Weighted Mean
Surgical mask	N.	0	2	10	60	317	95.6
	%	0.0	0.5	2.6	15.4	81.5	
Water and soap after examining patients for at least 20 sec	N.	2	4	16	72	295	93.6
	%	0.5	1.0	4.2	18.5	75.8	
Hand sanitizers	N.	18	23	33	75	240	85.6
	%	4.6	5.9	8.5	19.3	61.7	
Gloves	N.	12	32	73	91	180	80.4
	%	3.1	8.2	18.8	23.5	46.4	
Disposable gown	N.	37	50	119	78	105	68.4
	%	9.5	12.9	30.5	20.1	27.0	
Face shield	N.	95	100	105	39	50	52.2
	%	24.4	25.7	27.0	10.0	12.9	
Eye protection goggles	N.	148	117	73	24	27	42.8
	%	38.0	30.1	18.8	6.2	6.9	
Cloth mask	N.	155	141	41	24	28	41.0
	%	39.8	36.3	10.5	6.2	7.2	
N95 mask	N.	173	159	30	16	11	36.0
	%	44.5	4.9	7.7	4.1	2.8	
Full body PPE suit	N.	194	133	34	18	10	35.2
	%	49.9	34.2	8.7	4.6	2.6	
Mean of Adherence = 63.04, Median = 62.00, SD= 12.63							

4.11 Opinion of study participants about PPE

According to table (4.12), about half of the participants (50.6%) agreed that the available full PPE in their workplace are sufficient for COVID-19 prevention. This, may be, indicates that full PPE is not available in all workplaces.

Table (4.12): Distribution of the study participants according to their opinion about the sufficiency of full PPE at work place

Items	N.	%
Yes	197	50.6
No	192	49.4
Total	389	100.0

4.12 Psychological impact of COVID-19 infection on health staff

4.12.1 Sources of stress and anxiety among study participants:

Table (4.13) shows the main causes of stress among infected medical staff, the most common source of stress was transmitting the virus to their families (weighted mean= 80.2). Secondly, the unavailability of COVID-19 cure till now (weighted mean= 72.8). Thirdly, lack of medical supplies and intensive care beds (weighted mean= 71.4). Fourthly, increase number of COVID-19 cases and deaths (weighted mean=70.4). Fifthly, shortage of medical staff and isolation have the same general agreement percentage (weighted mean=69.4 for medical staff shortage and 69.2 for isolation). Sixthly, inadequacy of COVID-19 information (weighted mean= 67.2). Seventhly, lack of trained staff (weighted mean=66.8). Eighthly, worry of medical staff on their health and impact of infection on their future health (weighted mean= 66.2). Ninthly, conflict between moral duty and personal safety (weighted mean= 64.2). Tenthly, social stigma (worry from looking of community and colleagues at them after infection) (weighted mean= 53.6). Finally, worry from work absence during COVID-19 infection (weighted mean= 52.8).

This findings were consistent with some studies conducted, in the Palestinian Occupied Territories, which showed that lack of adequate infrastructure, shortage of PPE, shortage of HCWs, personal and family's safety, social stigma and lack of recognition were the main sources of stress and anxiety among Palestinian HCWs during COVID-19 pandemic (MAP, 2021; Mahamid,Veronese, & Bdier, 2021).

Table (4.13): Sources of stress and anxiety among study participants

Paragraph		Strongly Agree	agree	Neutral	Disagree	Strongly disagree	Weighted mean
I was worried about the risk of transmitting the virus to my family and friends	N.	227	62	15	45	40	80.2
	%	58.4	15.9	3.9	11.6	10.2	
I was worried that there was no cure for COVID-19 infection	N.	131	121	37	66	34	72.8
	%	33.7	31.1	8.5	17.0	8.7	
I was worried about the lack of medical supplies and intensive care beds	N.	115	125	51	64	34	71.4
	%	29.6	32.1	13.1	16.5	8.7	
I was concerned about the increase in the number of COVID-19 cases and deaths	N.	123	110	45	70	41	70.4
	%	31.6	28.3	11.6	18.0	10.5	
I was worried about the shortage of medical staff	N.	105	126	45	74	39	69.4
	%	27.0	32.4	11.6	19.0	10.0	
I was worried about being isolated and being separated from my family	N.	119	112	41	63	54	69.2
	%	30.6	28.8	10.5	16.2	13.9	
I was worried about the inadequacy of COVID-19 information	N.	91	120	51	93	34	67.2
	%	23.4	30.8	13.2	23.9	8.7	
I was concerned about the lack of trained medical staff to deal with COVID-19 patients	N.	97	104	58	94	36	66.8
	%	24.9	26.7	14.9	24.2	9.3	
I felt anxious from the impact of COVID-19 infection on my health and its future complication	N.	95	117	34	99	44	66.2
	%	24.5	30.1	8.7	25.4	11.3	
I felt anxious as a result of the conflict between my professional and moral duty and my personal safety	N.	88	97	65	88	51	64.2
	%	22.6	24.9	16.7	22.6	13.2	
I was worried about how my colleagues and community members looked at me after COVID-19 infection (social stigma)	N.	62	73	43	100	111	53.6
	%	15.9	18.8	11.1	25.7	28.5	
I felt anxious as a result of my absence from work while I was infected with the virus	N.	37	83	63	114	92	52.8
	%	9.5	21.3	16.2	29.3	23.7	
Mean = 67.02, Median= 70.00, SD= 19.41							

4.12.2 Factors contributed to reduce anxiety and stress among study participants:

The table (4.14) shows the factors that might contribute in reducing stress and anxiety among infected medical staff. Family support was the most common factor that reduce the negative emotions (weighted mean= 87). secondly, friends and co-workers support which play an effective role in reducing stress (weighted mean= 81.6). The societal structure of the Palestinian people and family bonding may contribute to reduce stress to a large degree. Thirdly, taking a vacation for rest and treatment (weighted mean= 75.8). Fourthly, taking care of their family and meeting their needs (weighted mean= 61.6). Fifthly, management appreciation (weighted mean= 60.4). Sixthly, psychological support (weighted mean= 56.0). Seventhly, the possibility of receiving financial compensation for COVID-19 infection (weighted mean= 45.6). Eighthly, the likelihood of receiving their families a financial compensation in the event of death (weighted mean= 38.0); which reflect job insecurity.

Table (4.14): Factors contributed to reduce anxiety and stress among study participants

Paragraph		Strongly disagree	Disagree	Neutral	agree	Strongly agree	Weighted mean
family support	N.	18	12	11	121	227	87.0
	%	4.6	3.1	2.8	31.1	58.4	
Friends and co-workers support	N.	23	15	28	166	157	81.6
	%	5.9	3.9	7.2	42.7	40.3	
Taking a vacation for treatment and rest	N.	49	20	28	160	132	75.8
	%	12.6	5.1	7.2	41.2	33.9	
Taking care of your family and meeting their needs during your infection period	N.	114	33	29	132	81	61.6
	%	29.3	8.5	7.5	33.9	20.8	
Management's appreciation of infected medical staff	N.	102	41	47	145	54	60.4
	%	26.2	10.5	12.1	37.3	13.9	
psychological support	N.	109	52	66	133	29	56.0
	%	28.0	13.3	17.0	34.2	7.5	
The possibility of receiving financial compensation for your infection	N.	171	58	61	78	21	45.6
	%	44.0	14.8	15.7	20.1	5.4	
The likelihood of receiving your family a financial compensation in the event of death as a result of work infection	N.	220	51	54	63	1	38
	%	56.5	13.1	13.9	16.2	0.3	
Mean= 63.26, Median= 65.00, SD= 17.06							

4.12.3 Coping strategies for stress management among study participants:

According to table (4.15), the most common three coping mechanisms that were adopted by the participants were religious and spiritual practices which represented 94.6%, 75.8% for communication with friends and family through social media, and 63.5% for sleeping. Other coping strategies like doing relaxation activities, having support from fellows, talking and encouraging myself, watching TV, listening to music, cutting off media that publish COVID-19 news, and reliance on cognition were adopted by (40.6%, 34.7%, 22.6%, 11.8%, 8.5%, 7.7% and 4.4% respectively). The least one was expression of feelings by crying and screaming which represented 3.3%.

Multi countries study reported more than 70% of participants adopted family support(communication) and 39.8% got peer support during infection period which was consistent with our study. In the same study conducting prayers was adopted by 50% and this belongs to religious and cultural beliefs (Htay et al., 2021).

Palestinians are people who adhere to the teachings of Islam and believe that Allah the Almighty is the source of strength, so it is common for everyone to seek help from Allah in times of distress. As mentioned before, the societal structure of the Palestinian people and its impact on achieving social support are important factors too. The nature of the COVID-19 infection requires the patient to be isolated, so sleeping was one of the commonly adopted ways.

Table (4.15): Coping strategies for stress management among study participants

Items	N.	%
Religious and Spiritual Practices	368	94.6
Communication with friends and family through social media	295	75.8
Sleeping	247	63.5
Doing relaxation activities such as meditation, deep breathing, sports	158	40.6
Having support from my fellows	135	34.7
Talking to myself and encouraging myself to overcome this disease	88	22.6
Watching TV	46	11.8
listening to music	33	8.5
Cutting off all media that publishes the number of infected people and deaths related to the virus	30	7.7
Reliance on rational cognition in dealing with disease	17	4.4
Expression of my feelings by crying, screaming, etc.	13	3.3

4.12.4 Stress among study participants:

The Depression, Anxiety, stress scale (21) is comprised of three self-report scales measuring; the emotional states of depression, anxiety, and stress. Each scale contains seven items which are rated on a four-point Likert scale ranging from 0(never) to 3(almost always). Table (4.16) shows item 1, 6, 8, 11 12, 14 and 18 which comprise the stress subscale. The results showed that mean of stress among participants was 13.53.

This finding was near to Chinese result where the stress mean was 11.7 (Yang et al., 2021). The medical staff was exposed to many stressors during the COVID-19 pandemic, which had many reasons that were previously discussed in the study.

Table (4.16): Stress among study participants:

Paragraph		Did not apply at all	To some degree, or some of the time	To a considerable degree, or a good part of time	Very much, or most of the time
I found it hard to wind down	N.	20	137	104	128
	%	5.2	35.2	26.7	32.9
I tended to over-react to situations	N.	10	109	129	141
	%	2.6	28.0	33.2	36.2
I felt that I was using a lot of nervous energy	N.	101	109	115	64
	%	26.0	28.0	29.6	16.4
I found myself getting agitated	N.	12	109	150	118
	%	3.1	28.0	38.6	30.3
I found it difficult to relax	N.	7	82	144	156
	%	1.8	21.1	37.0	40.1
I was intolerant of anything that kept me from getting on with what I was doing	N.	23	97	117	152
	%	5.9	24.9	30.1	39.1
I felt that I was rather touchy	N.	19	82	121	167
	%	4.9	21.1	31.1	42.9
Mean = 13.53, Median = 13.00, SD = 2.78					

4.12.5 Anxiety among study participants:

Table (4.17) shows items 2, 4, 7, 9, 15, 19 and 20 which comprise the anxiety subscale. The results show that the mean of anxiety score of the participants was 8.7.

This finding was close to study finding in China where the mean of anxiety= 7.9 (Yang et al., 2021).In addition to the many causes of stress that were mentioned, which lead to a high level of anxiety, many questions related to anxiety are similar to the physical symptoms of COVID-19 infection, as many infected people have suffered from these

symptoms after the end of quarantine for a period of time, such as tremor, increase respiratory rate, increase heart rate, dryness of mouth, and shortness of breath without effort, which increase the anxiety score.

Table (4.17): Anxiety among study participants

Paragraph		Did not apply at all	To some degree, or some of the time	To a considerable degree, or a good part of time	Very much, or most of the time
I felt dryness of my mouth	N.	51	98	119	121
	%	13.1	25.2	30.6	31.1
I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	N.	100	112	86	91
	%	25.7	28.8	22.1	23.4
I experienced trembling (e.g. in the hands)	N.	151	104	82	52
	%	38.8	26.7	21.1	13.4
I was worried about situations in which I might panic and make a fool of myself	N.	162	110	80	37
	%	41.6	28.3	20.6	9.5
I was close to panic	N.	77	105	113	94
	%	19.8	27.0	29.0	24.2
I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	N.	165	95	66	63
	%	42.2	24.4	17.0	16.2
I felt scared without any good reason	N.	210	100	44	35
	%	54.0	25.7	11.3	9.0
Mean = 8.70, Median = 8.00, SD = 4.50					

4.12.6 Depression among study participants:

Table (4.18) shows items 3, 5, 10, 13, 16, 17 and 21 which comprise the depression subscale. The results show that the mean of depression for the participants is 8.12.

This finding was consistent with a Chinese study that reported depression mean = 8.6 (Yang et al., 2021).

Table (4.18): Depression among study participants

Paragraph		Did not apply at all	To some degree, or some of the time	To a considerable degree, or a good part of time	Very much, or most of the time
I couldn't seem to experience any positive feeling at all	N.	102	138	90	59
	%	26.2	35.5	23.1	15.2
I found it difficult to work up the initiative to do things	N.	43	135	138	73
	%	11.1	34.7	35.5	18.8
I felt that I had nothing to look forward to	N.	185	101	76	27
	%	47.6	26.0	19.5	6.9
I felt down-hearted and blue	N.	64	144	120	61
	%	16.5	37.0	30.8	15.7
I was unable to become enthusiastic about anything	N.	76	128	106	79
	%	19.5	32.9	27.2	20.3
I felt I wasn't worth much as a person	N.	272	79	46	22
	%	62.2	20.3	11.8	5.7
felt that life was meaningless	N.	216	75	49	49
	%	55.5	19.3	12.6	12.6
Mean 8.12, Median = 7.00, SD = 4.29					

4.12.7 DASS-21 categorization among study participants:

The table (4.19) shows the participants are falling into four categories; normal, mild, moderate and severe based on cut-off points (Depression >4, Anxiety >3, stress >7). Of all participants, 32.4% had symptoms of depression, 54% anxiety and 33.7% stress. For depression subscale, 17.5% of the study sample reported mild symptoms, 14.1% reported moderate, and 0.8% reported severe symptoms. For anxiety subscale, 19% of the sample were considered to have mild symptoms, 22.4% moderate anxiety, and 12.6% severe symptoms. For stress subscale, 28.5% reported mild stress, and 5.2 % reported moderate symptoms.

This finding was near to depression, anxiety, and stress prevalence among Chinese health care workers, but with significant higher anxiety prevalence in our study (37.8%, 43.0%, and 38.5% respectively) (Yang et al., 2021). Meta-analysis study reported 37% prevelance for anxiety and 36% prevelance for depression (Sun et al., 2021).

The medical staff was exposed to great psychological stress during the COVID-19 pandemic. The negative emotions, maybe, were the greatest during the first wave because of the new experience they had to go through. Nevertheless, this study involved infected staff from the first, second, and third wave, as the infected staff of the third wave may be less tense than the first wave, for they become more informed about the disease. In addition to many factors such as the recurrent "Israeli" wars and the low income that

existed before the epidemic, which negatively affected their psychological states. However, there is also a large group of medical staff, especially the physicians, who deny the existence of any psychological problems; may be due to social prestige. This possibly indicates that there is a lack of psychological education among the medical staff, and they still consider seeking psychological help as a stigma. Therefore, the MOH, with the support of the Red Cross, has arranged special programs (Help the Helpers) for all HCWs to reduce their psychological pressure (MOH, 2021d).

Table (4.19): DASS-21categorization among study participants

Items	N.	%
Depression		
Normal	263	67.6
Mild	68	17.5
Moderate	55	14.1
Severe	3	.8
Total	389	100.0
Anxiety		
Normal	179	46.0
Mild	74	19.0
Moderate	87	22.4
Severe	49	12.6
Total	389	100.0
Stress		
Normal	258	66.3
Mild	111	28.5
Moderate	20	5.2
Severe	0	0.0
Total	389	100.0

4.13 Distribution of KAP, PPE adherence, DAS according to gender

According to table (4.20); by using independent t-test, knowledge, attitude and practice differences between male and female are not statistically significant. According to PPE adherence, male participants were more adherent to PPE than female (mean=64.3, p= 0.031). On anxiety subscale, female participants were more anxious than male (mean =13.8); the difference between male and female in anxiety subscale was highly statistically significant (p< 0.001). Depression was also higher in female (mean= 10.1, p= 0.012). The overall DAS score was higher in female which is highly statistically significant (mean=32.6, p < 0.001).

This finding was close to study in Dubai showed that there is no statistically significant difference between male and female in Knowledge, attitude and practice(Albahri et al., 2021). The finding that females are more depressed was consistent with Chinese study

(Yang et al., 2021). Meta-analysis study reported higher anxiety and depression prevalence among women which was consistent with our study finding(Sun et al., 2021).

These results may be explained by what was previously mentioned that the Ministry relied, in its early stages, on males in high- risk positions that deal directly with patients, such as laboratories, sampling, ICU, and quarantines, which make males more adherent to PPE. The finding that females are more anxious and depressed may be explained by the differences in brain chemistry and hormone fluctuations. In addition to that, females have a constant worry about their children.

Table (4.20): Distribution of KAP, PPE adherence, DAS according to gender

	Gender	N	Mean	SD	T	Sig.
Health staff Knowledge	Male	213	68.86	16.96	1.664	0.097
	Female	176	65.97	17.10		
Health staff attitude	Male	213	68.78	17.19	-0.292	0.770
	Female	176	69.32	19.17		
Health Staff Practices	Male	213	82.0	12.7	-0.644	0.520
	Female	176	82.8	12.0		
adherence to PPE	Male	213	64.3	13.3	2.161	0.031*
	Female	176	61.5	11.6		
Stress	Male	213	13.3	2.8	-1.721	0.086
	Female	176	13.8	2.7		
Anxiety	Male	213	7.5	4.0	-5.878	0.000*
	Female	176	10.1	4.7		
Depression	Male	213	7.6	4.1	-2.516	0.012*
	Female	176	8.7	4.4		
DAS	Male	213	28.5	8.7	-4.409	0.000*
	Female	176	32.6	10.0		

* Independent t-test *Statistically Significant

4.14 Distribution of KAP, PPE adherence, DAS according to age group

Using ANOVA Test, the table (4.21) shows that the difference in knowledge, attitude, practice, and PPE adherence between different age groups (<30, 31-40, 41-50, >50) were not statistically significant. In addition to that, the differences in stress, anxiety, depression and overall DAS between different age groups were also not statistically significant.

This finding was consistent with a study in Dubai(Albahri et al., 2021). It could be because the COVID-19 epidemic is new and was not identified before, so its effect was the same on all age groups.

Table (4.21): Distribution of KAP, PPE adherence, DAS according to age group

	Age	N	Mean	SD	F	Sig.
Health staff Knowledge	30 and younger	171	68.62	17.31	0.541	0.654
	31 -40	136	66.50	16.78		
	41 - 50	61	67.76	17.42		
	Older than 50	21	65.10	16.20		
	Total	389	67.55	17.06		
Health staff attitude	30 and younger	171	67.64	17.87	0.745	0.526
	31 -40	136	69.61	18.47		
	41 - 50	61	70.49	17.32		
	Older than 50	21	72.22	19.95		
	Total	389	69.02	18.09		
Health Staff Practices	30 and younger	171	81.5	12.8	0.745	0.526
	31 -40	136	82.9	11.7		
	41 - 50	61	82.4	13.2		
	Older than 50	21	85.2	10.9		
	Total	389	82.3	12.4		
Adherence to PPE	30 and younger	171	64.7	12.5	2.387	0.069
	31 -40	136	61.7	12.4		
	41 - 50	61	60.7	11.7		
	Older than 50	21	65.1	16.0		
	Total	389	63.0	12.6		
Stress	30 and younger	171	13.6	2.8	1.388	0.246
	31 -40	136	13.8	2.7		
	41 - 50	61	13.0	2.7		
	Older than 50	21	13.0	2.9		
	Total	389	13.5	2.8		
Anxiety	30 and younger	171	8.7	4.3	0.061	0.98
	31 -40	136	8.8	4.6		
	41 - 50	61	8.6	4.8		
	Older than 50	21	8.4	5.0		
	Total	389	8.7	4.5		
Depression	30 and younger	171	8.3	4.5	0.227	0.877
	31 -40	136	8.1	4.1		
	41 - 50	61	7.8	3.8		
	Older than 50	21	7.9	4.9		
	Total	389	8.1	4.3		
DAS	30 and younger	171	30.5	9.3	0.375	0.771
	31-40	136	30.7	9.5		
	41 - 50	61	29.4	9.5		
	Older than 50	21	29.2	11.5		
	Total	389	30.3	9.5		

*ANOVA test *Statistically Significant

4.15 Distribution of KAP, PPE adherence, DAS according to marital status

By using independent t-test, the table (4.22) shows that there are no statistically significant differences between married and unmarried infected medical staff in knowledge; attitude, practice, PPE adherence, stress, anxiety, depression and DAS. This finding was consistent with Chinese study (Yang et al., 2021).

This finding may be interpreted by the modernity of disease and its unifying effect. In addition, the married and the unmarried had relatives of the elderly and those with chronic diseases which make the psychological impact the same.

Table (4.22): Distribution of KAP, PPE adherence, DAS according to marital status

	Marital Status	N	Mean	SD	T	Sig.
Health staff Knowledge	Married	286	67.07	17.25	-0.882	0.378
	Not Married	103	68.82	16.54		
Health staff attitude	Married	286	69.46	18.47	0.800	0.424
	Not Married	103	67.80	17.03		
Health Staff Practices	Married	286	82.9	12.4	1.422	0.156
	Not Married	103	80.9	12.2		
Adherence to PPE	Married	286	62.7	12.7	-0.973	0.331
	Not Married	103	64.1	12.5		
Stress	Married	286	13.6	2.8	0.519	0.604
	Not Married	103	13.4	2.7		
Anxiety	Married	286	8.8	4.6	0.756	0.450
	Not Married	103	8.4	4.3		
Depression	Married	286	8.1	4.3	-0.088	0.930
	Not Married	103	8.2	4.3		
DAS	Married	286	30.5	9.7	0.471	0.638
	Not Married	103	30.0	8.9		

*Independent t-test * Statistically Significant

4.16 Distribution of KAP, PPE adherence, DAS according to governorate

Using ANOVA test, the table (4.23) shows that Rafah was the highest governorate in PPE adherence (mean=67.4, p=0.007); using Post Hoc (LSD), the difference was present between Rafah and Gaza whereas Rafah was higher in PPE adherence than Gaza (mean difference= 6.73, p=0.002), as well as, Rafah was higher in PPE adherence than the Middle (mean difference= 5.41, p=0.0021). Also, there was a statistically significant difference between Khan Younis and Gaza whereas Khan Younis was higher than Gaza in PPE adherence (mean difference=4.93, p= 0.006). Otherwise, there were no statistically significant differences between other domains like knowledge, attitude, practice, stress, anxiety, depression and DAS, and the five governorates (Annex7).

This finding might refer to small population number of Rafah governorate and wide spacing; therefore, the available PPE is expected to be sufficient to cover its staff. Rafah is also characterized by a few hospitals compared to other governorates.

Table (4.23): Distribution of KAP, PPE adherence, DAS according to governorate

	Governorates	N	Mean	SD	F	Sig.
Health Staff Knowledge	North	57	63.68	17.14	2.629	0.067
	Gaza	134	67.74	15.85		
	Middle Zone	74	66.74	17.37		
	Khan Younis	78	66.62	17.77		
	Rafah	46	64.25	17.52		
	Total	389	67.55	17.06		
Health staff attitude	North	57	70.47	13.37	1.192	0.312
	Gaza	134	66.54	18.34		
	Middle Zone	74	68.69	21.18		
	Khan Younis	78	71.37	16.75		
	Rafah	46	71.01	19.06		
	Total	389	69.02	18.09		
Health Staff Practices	North	57	80.4	12.2	2.188	0.070
	Gaza	134	80.9	12.8		
	Middle Zone	74	82.2	13.1		
	Khan Younis	78	85.2	11.0		
	Rafah	46	84.4	11.6		
	Total	389	82.3	12.4		
Adherence to PPE	North	57	63.0	10.8	3.574	0.007*
	Gaza	134	60.7	12.5		
	Middle Zone	74	62.0	11.2		
	Khan Younis	78	65.6	13.1		
	Rafah	46	67.4	14.7		
	Total	389	63.0	12.6		
Stress	North	57	13.7	2.2	0.163	0.957
	Gaza	134	13.5	2.9		
	Middle Zone	74	13.5	2.7		
	Khan Younis	78	13.6	3.0		
	Rafah	46	13.3	3.0		
	Total	389	13.5	2.8		
Anxiety	North	57	8.7	4.7	0.318	0.866
	Gaza	134	8.4	4.4		
	Middle Zone	74	8.9	4.5		
	Khan Younis	78	9.0	4.6		
	Rafah	46	8.9	4.7		
	Total	389	8.7	4.5		
Depression	North	57	8.8	4.8	0.648	0.629
	Gaza	134	7.8	4.0		
	Middle Zone	74	8.2	3.9		
	Khan Younis	78	8.2	4.4		
	Rafah	46	8.1	4.8		
	Total	389	8.1	4.3		
DAS	North	57	31.3	9.8	0.396	0.812
	Gaza	134	29.6	9.0		
	Middle Zone	74	30.6	9.0		
	Khan Younis	78	30.7	10.2		
	Rafah	46	30.3	10.5		
	Total	389	30.3	9.5		

*ANOVA test *Statistically Significant

4.17 Distribution of KAP, PPE adherence, DAS according to job title

By using ANOVA test, the table (4.24) shows that nurses were reported the highest score in practice (mean = 84.9, p=0.001); the difference was highly statistically Significant between nurse and physician (mean difference=5.23, p< 0.001), and between nurse and others (mean difference=8.38, p= 0.001). According to PPE adherence, lab technicians were the highest in PPE adherence and the difference was highly statistically Significant (mean=65.5, p< 0.001). The differences in PPE adherence were between: physicians and pharmacists (physicians were higher than pharmacists (mean difference=10.27, p=0.001)), nurses and physicians (nurses were higher than physicians (mean difference=4.69, p=0.001)), nurses and pharmacists (nurses were higher than pharmacists; this difference is highly statistically significant (mean difference=14.96, p<0.001)), lab technicians and pharmacists (lab technicians were more PPE adherent than pharmacists; this difference is highly statistically significant (mean difference= 15.12, p<0.001)), radiologists and pharmacists (radiologists were more adherent (mean difference=13.57, p=0.003)), and between pharmacists and others (midwife, anesthesia technician, psychologist, physiotherapist, dentist); others were more adherent (mean difference=10.37, p=0.005). On anxiety subscale, nurses were the most anxious among the different professions (mean =9.7, p<0.001); especially, nurses were more anxious than physicians (mean difference=2.42, p<0.001) and more anxious than others (mean difference=1.90, p=0.043). According to depression subscale, nurses were also the most depressed people (mean=9, p=0.002). Nurses were more depressed than physicians (mean difference=1.76, p=0.001), lab technicians (mean difference=2.32, p=0.005), and others (mean difference=2.03, p=0.024). Nurses were reported the highest DAS score; this result is highly statistically significant (mean= 32.6, p<0.001). Nurses were higher than physicians in DAS score (mean difference=5.06, p<0.001), nurses were also higher than lab technicians (mean difference=3.73, p=0.038), and nurses were higher than others (mean difference=4.25, p=0.032) (Annex 8).

Nurses are reported the highest score in practice which was consistent with study findings in Nebal (Tamang et al., 2020). Nurses are the most anxious and depressed people which was consistent with meta-analysis study that reported higher rates of anxiety and depression in nurses than doctors(Sun et al., 2021).

This finding, may be, because nurses are the most people who have direct contact with COVID-19 patients, which forced them to follow preventive practices more than others. The high workload and the continuous contact with COVID-19 patients may make them the most anxious and depressed. Laboratory technicians were in charge of handling different samples that have been withdrawn for COVID-19 testing, so they must be PPE committed to the highest degree. Additionally, laboratories are considered to be the highest risky places, so all types of PPE mostly are always available.

Table (4.24): Distribution of KAP, PPE adherence, DAS according to job title

	Job Title	N	Mean	SD	F	Sig.
health staff Knowledge	Physician	107	71.24	15.49	1.524	0.181
	Pharmacist	19	66.08	16.76		
	Nurse	195	65.81	16.88		
	Lab technician	31	67.02	17.80		
	Radiologist	12	64.81	21.10		
	Other	25	68.44	20.10		
	Total	389	67.55	17.06		
Health staff attitude	Physician	107	69.00	15.93	0.506	0.771
	Pharmacist	19	71.05	13.43		
	Nurse	195	68.38	19.44		
	Lab technician	31	72.04	19.90		
	Radiologist	12	73.61	16.60		
	Other	25	66.67	18.00		
	Total	389	69.02	18.09		
Health Staff Practices	Physician	107	79.3	12.7	4.329	0.001*
	Pharmacist	19	81.5	10.5		
	Nurse	195	84.9	11.6		
	Lab technician	31	83.1	12.5		
	Radiologist	12	79.8	13.2		
	Other	25	76.5	14.1		
	Total	389	82.3	12.4		
Adherence to PPE	Physician	107	60.7	12.0	6.754	0.000*
	Pharmacist	19	50.4	7.0		
	Nurse	195	65.4	12.4		
	Lab technician	31	65.5	13.1		
	Radiologist	12	64.0	12.1		
	Other	25	60.8	13.3		
	Total	389	63.0	12.6		
Stress	Physician	107	13.0	2.5	1.528	0.180
	Pharmacist	19	13.3	2.9		
	Nurse	195	13.9	2.9		
	Lab technician	31	13.2	2.7		
	Radiologist	12	13.8	2.0		
	Other	25	13.6	2.6		
	Total	389	13.5	2.8		
Anxiety	Physician	107	7.3	3.9	4.763	0.000*
	Pharmacist	19	7.7	3.2		
	Nurse	195	9.7	4.9		
	Lab technician	31	9.0	4.1		
	Radiologist	12	7.7	4.2		
	Other	25	7.8	3.2		
	Total	389	8.7	4.5		
Depression	Physician	107	7.3	4.2	3.905	0.002*
	Pharmacist	19	8.1	3.1		
	Nurse	195	9.0	4.6		
	Lab technician	31	6.7	3.2		
	Radiologist	12	7.1	3.5		
	Other	25	7.0	3.1		
	Total	389	8.1	4.3		
DAS	Physician	107	27.5	8.4	4.805	0.000*
	Pharmacist	19	29.2	6.7		
	Nurse	195	32.6	10.6		
	Lab technician	31	28.9	7.4		
	Radiologist	12	28.5	6.7		
	Other	25	28.4	5.7		
	Total	389	30.3	9.5		

*ANOVA test *Statistically Significant

4.18 Distribution of KAP, PPE adherence, DAS according to work place

By using independent t-test, the table (4.25) shows that there is no statistically significant difference between staff who are working in hospitals and primary health care regarding knowledge and practices, while there is a statistically significant difference in attitude; PHC workers are higher with mean 76.03 ($p< 0.001$). In addition to that, there is no statistically significant difference between hospital and PHC in PPE adherence. There is a statistically significant differences between hospitals and PHCs staff in anxiety. Medical staff who are working in hospitals were more anxious than who are working in PHC (mean=9, p=0.012) as well as they were more depressed (mean=8.4, p= 0.008). The overall DAS score was higher in medical staff who work in hospitals than PHC (mean=31, p= 0.008).

This finding maybe because of the high number of patients and the nature of cases that went to the hospital. Severe cases went to hospitals, not to PHCs. The nature of interventions also differs within hospitals and primary health care units which makes hospital medical staff with less positive attitude, and more anxious and depressed.

Table (4.25): Distribution of KAP, PPE adherence, DAS according to work place

	Work Place	N	Mean	SD	T	Sig.
Health staff Knowledge	Hospital	316	67.86	17.03	0.754	0.456
	PHCs	73	66.21	17.22		
Health staff attitude	Hospital	316	67.41	18.19	-3.731	0.000*
	PHCs	73	76.03	15.95		
Health Staff Practices	Hospital	316	82.4	12.6	0.239	0.811
	PHCs	73	82.0	11.2		
PPE adherence	Hospital	316	63.6	12.5	1.667	0.096
	PHCs	73	60.8	12.9		
Stress	Hospital	316	13.6	2.8	0.966	0.335
	PHCs	73	13.2	2.7		
Anxiety	Hospital	316	9.0	4.5	2.511	0.012
	PHCs	73	7.5	4.2		
Depression	Hospital	316	8.4	4.4	2.654	0.008*
	PHCs	73	6.9	3.5		
DAS	Hospital	316	31.0	9.7	2.675	0.008*
	PHCs	73	27.7	8.4		

*Independent t-test *Statistically Significant

4.19 Distribution of KAP, PPE adherence, DAS according to department

The table (4.26) shows that there is a statistically significant differences between departments in attitude score. Internal medicine department was the highest positive attitude score among other departments (mean= 72.46, p= 0.026) (using ANOVA test); Using Post Hoc (LSD), internal medicine was higher in attitude score than obstetrics &gynecology (mean difference=10.49, p=0.009) and emergency (mean difference=11.35, p=0.007). ICU was higher than obstetrics &gynecology (mean difference=9.17, p= 0.026) and emergency (mean difference= 10.02, p= 0.020). Corona medical unit was higher than obstetrics &gynecology (mean difference=9.60, p= 0.026) and emergency (mean difference=10.45, p= 0.020). According to knowledge and practice, there were no statistically significant differences between different departments. According to PPE adherence, ICU was the most PPE adherent department (mean=71.3, p< 0.001);the difference was statistically significant between ICU and internal medicine (mean difference=9.40, p< 0.001), surgery (mean difference= 10.96, p< 0.001), obstetrics &gynecology (mean difference=7.11, p=0.008), pediatric (mean difference= 8.60, p= 0.003), and emergency (mean difference= 7.25, p= 0.010). Corona medical unit was more PPE adherent than internal medicine (mean difference= 6.79, p= 0.013), surgery (mean difference=8.35, p= 0.003), and pediatric (mean difference= 5.99, p= 0.045). According to anxiety subscale, medical staff who work in obstetrics &gynecology department was the most anxious among other departments (mean =12.1, p= 0.007) (Annex 9).

The finding that internal medicine department had the highest positive attitude, may be, because they are the most people who dealt with COVID-19 patients, in addition to that, they are familiar with infectious disease in general because of their specialization, which helped them get rid of fears of disease and face it on the ground affecting their attitudes positively. ICU was the most PPE adherent department, this finding is expected as they deal with the most critical patients. Obstetrics and Gynecology departments was the most anxious department, may be, because the death of the director of the outpatient clinic of the obstetrics and gynecology department from COVID-19 infection that increases the level of anxiety.

Table (4.26): Distribution of KAP, PPE adherence, DAS according to department

	Department	N	Mean	SD	F	Sig.
Health staff Knowledge	internal medicine	46	71.50	16.83	1.849	0.090
	Surgery	40	69.44	16.83		
	Obstetrics and Gynecology	39	61.25	15.27		
	Pediatric	31	67.74	15.28		
	Emergency	33	68.69	17.67		
	ICU	41	69.92	16.15		
	Corona medical unit	34	71.24	13.43		
	Total	264	68.60	16.18		
Health staff attitude	internal medicine	46	72.46	18.99	2.437	0.026*
	Surgery	40	65.83	14.10		
	Obstetrics and Gynecology	39	61.97	22.60		
	Pediatric	31	67.20	15.20		
	Emergency	33	61.11	17.51		
	ICU	41	71.14	15.38		
	Corona medical unit	34	71.57	22.30		
	Total	264	67.55	18.59		
Health Staff Practices	internal medicine	46	83.6	10.1	0.674	0.671
	Surgery	40	82.6	13.8		
	Obstetrics and Gynecology	39	83.3	14.4		
	Pediatric	31	85.2	9.2		
	Emergency	33	80.3	14.3		
	ICU	41	85.1	11.6		
	Corona medical unit	34	84.5	10.7		
	Total	264	83.5	12.1		
Adherence to PPE	internal medicine	46	61.9	10.6	4.193	0.000*
	Surgery	40	60.4	11.5		
	Obstetrics and Gynecology	39	64.2	14.1		
	Pediatric	31	62.7	8.9		
	Emergency	33	64.1	14.9		
	ICU	41	71.3	13.1		
	Corona medical unit	34	68.7	8.8		
	Total	264	64.7	12.4		
Stress	internal medicine	46	13.7	3.0	0.451	0.844
	Surgery	40	13.6	2.6		
	Obstetrics and Gynecology	39	13.4	3.1		
	Pediatric	31	14.4	2.6		
	Emergency	33	13.5	3.1		
	ICU	41	13.9	3.0		
	Corona medical unit	34	13.7	2.6		
	Total	264	13.7	2.9		

Table (4.26a): Continued

Anxiety	internal medicine	46	8.7	4.5	3.017	0.007*
	Surgery	40	8.1	4.2		
	Obstetrics and Gynecology	39	12.1	4.6		
	Pediatric	31	9.4	4.8		
	Emergency	33	9.6	5.1		
	ICU	41	9.0	4.9		
	Corona medical unit	34	8.7	4.5		
	Total	264	9.3	4.8		
Depression	internal medicine	46	7.8	4.0	1.875	0.085
	Surgery	40	8.3	4.3		
	Obstetrics and Gynecology	39	10.4	5.1		
	Pediatric	31	7.6	4.0		
	Emergency	33	9.8	4.6		
	ICU	41	8.6	5.0		
	Corona medical unit	34	8.9	4.9		
	Total	264	8.8	4.6		
DAS	internal medicine	46	30.2	9.0	1.538	0.166
	Surgery	40	29.9	9.3		
	Obstetrics and Gynecology	39	35.9	11.4		
	Pediatric	31	31.5	9.1		
	Emergency	33	32.9	11.8		
	ICU	41	31.5	11.1		
	Corona medical unit	34	31.3	9.6		
	Total	264	31.8	10.3		

*ANOVA test *Statistically Significant

4.20 Association between COVID-19 infection severity and blood groups

Using Chi Square, the table (4.27) shows that the association between blood group and infection severity is not statistically significant (p=0.337), so there is no a relationship between blood group and severe COVID-19 infection. This finding was consistent with other studies that confirmed that there is no association between blood group and COVID-19 infection (Boudin et al., 2020; Kumar et al., 2021).

Table (4.27): Association between COVID-19 infection severity and blood groups

Severity of Infection	Hospital Admission		Didn't need any treatment		Supportive therapy at home		Total	
	N	%	N	%	N	%	N	%
Blood Group								
A	5	3.9	20	15.5	104	80.6	129	100.0
B	5	6.3	14	17.5	61	76.3	80	100.0
AB	5	8.8	6	10.5	46	80.7	57	100.0
O	9	7.3	10	8.1	104	84.6	123	100.0
Total	24	6.2	50	12.9	315	81.0	389	100.0
X^2 = 6.830, Df = 6, Sig. = 0.337								

*Chi Square Test *Statistically Significant

Chapter Five

Conclusion and Recommendations

5.1 Conclusion

COVID-19 pandemic has created an emergency state around the world generally as well as in Gaza Strip. COVID-19 is a new disease which has never been known before; its morbidity and mortality rates create intense horror for all people, especially for health care workers who are the frontline fighters causing adverse psychological impacts. This study aimed at identifying knowledge, attitudes, practices, psychological impact and coping strategies amongCOVID-19 infected health staff in the Gaza Strip using a quantitative method. A cross sectional study was conducted using online questionnaire distributed through convenient sampling to collect the needed data from participants.

The findings of this study were collected from males (54.8%) and females (45.2%); 44.0% of the participants aged 30 years old and younger, 73.5% of the study participants were married, 71.5% had Bachelor degree, and 34.4% of participants live in Gaza.

The study findings have revealed that half of the participant was nurses (50.1%), and 27.5% physicians. 81.2% of the participants work in hospitals while only 18.8% work in PHCs.

The majority of participants (95.4%) had COVID-19 symptoms; the most common five symptoms in order were headache, fatigue, cough, muscle and back pain, and fever (86.5%, 85.2%, 76.6%, 73.3%, 72.5% respectively).

Loss of smell was present in 68.5% of the participants, and loss of taste were in 59.3%. Other COVID-19 respiratory symptoms were sore throat, runny nose, shortness of breath, and chest pain which represented (61.2%, 43.1% 39.9%, 38.5%, respectively).

Gastrointestinal symptoms suffered included diarrhea (46.1%), abdominal pain (32.1%) and vomiting (14.3%). 3.2% suffered from dermatological symptoms like rash.

The majority of study participants (81.0%) got supportive treatment at home for COVID-19 symptoms, and 6.2% needed admission at hospital.

With regard to COVID-19 trainings, 66.4% received formal training for PPE donning and doffing, and 82.9% received formal training for infection control procedures. But Half of them (52.6%) said that these trainings were inadequate to prevent infection.

Regarding risk factors of COVID-19 infection,10% of the participants were smokers, 12% of the infected female were pregnant, 12.9% of the participants were obese, 8.5% were hypertensive, and 4.9% were diabetic.

For COVID-19 vaccination, about half of participants (56%) were vaccinated at a time of data collection.

Medical staff knowledge of COVID-19 showed that 96.1% of the participants had a previous information about COVID-19 before getting infection, 65% had information from medical centers and staff, 64.2% by virtue of study and specialization, and 56.6% from internet websites. 16.7% of the participants really believes in conspiracy about COVID-19.

Participants have a mean score of knowledge of 67.55. The most confusing parts were, the source of COVID-19, using of steroid in COVID-19 treatment, role of herbal remedies in COVID-19 prevention, and COVID-19 spreading season while mean score of attitudes was 69.02.

Positive attitudes toward the role of face mask in COVID-19 prevention, the importance of precautionary actions for COVID-19 spread, role of vaccine in reducing mortality rate and role of comprehensive closure in controlling of COVID-19 spread.

Practices of participants were very good with mean score 82.34, the highest practice percentages (90% and above) were for using hand sanitizers, wearing medical masks and washing hands with water and soap.

The mean of adherence to PPE was 63.04; wearing medical mask (95.6%), washing hands with water and soap after examining each patient (93.6%) and using hand sanitizers at workplace (85.6%). About half of the participants agreed that the available PPE in their workplace are sufficient for COVID-19 prevention.

The most common stress sources among infected medical staff were the transmission of the virus to their families (weighted mean= 80.2), unavailable cure for COVID-19

infection (weighted mean= 72.8), lack of medical supplies and intensive care beds (weighted mean= 71.4), increase number of COVID-19 cases and deaths (weighted mean= 70.4), shortage of medical staff (weighted mean= 69.4), as well as, isolation (weighted mean= 69.2).

The most common factors that reduce stress among infected medical staff were family support (weighted mean= 87), friends and co-worker support (weighted mean= 81.6), the vacation for treatment and rest (weighted mean= 75.8), taking care of family and meeting their needs (weighted mean= 61.6), and management appreciation (weighted mean= 60.4).

The majority of participants adopted positive coping strategies represented by religious and spiritual activities (94.6%), communication with family and friends (75.8%), sleeping (63.5%), relaxation activities (40.6%), and having support from fellows (34.7%).

DAS-21 scale showed that depression among participants was 32.4% (17.5% mild, 14.1% moderate, 0.8% severe), anxiety prevalence was 54% (19% mild, 22.4% moderate, 12.6% severe) while stress prevalence was 33.7% (28.5% mild, 5.2% moderate).

The study findings have shown that females were statistically significant more anxious and depressed than males, and the overall DAS score was higher in female participants.

laboratory technicians were the most PPE adherent among HCWs. Nurses were the most prevalent group in anxiety and depression. The overall DAS score was also statistically significant higher in nurses.

ICU was the most PPE adherent department. However, obstetrics and gynecology department was the most prevalent in anxiety.

The distribution of blood group of participants showed that, 33.2% were blood group (A), 31.6% blood group (O), 20.6% blood group (B), and 14.6% have blood group (AB). The findings revealed no statistically significant relationship between blood group and severe COVID-19 infection.

5.2 Recommendations

5.2.1 General recommendations

In light of the results obtained and the related literature, the followings are recommended:

-The Ministry of Health should provide additional training programs and guidelines about COVID-19 prevention, infection control procedures, and PPE adherence for medical staff.

- Honoring health workers properly for their efforts both morally and financially.

- Improving knowledge, attitudes, and self-coping strategies are critical in the current situation.

-Improving vaccination awareness campaigns is very important in controlling the epidemic and reducing mortality rate.

-Reducing work load is very important to reduce stress and anxiety after the strenuous efforts.

-Periodic shifting of staff from high risk departments to lower risk may be effective in reducing stress and maintaining the psychological health.

-Strengthening the psychoeducation for medical staff about the importance of maintaining mental health and the signs of psychological problems.

-Designing timely, proper psychological interventions for all health care workers, and especially focusing on highly risk staff; nurses, females, hospital health care workers, some special departments, especially the one who witnessed the deaths some of its staff, and those who have higher psychological burden during COVID-19 epidemic.

-Conducting long-term programs for periodic education and psychological support sessions for all staff generally, and especially, for infected staff is very important to maintain their mental health.

-Training psychologists on phone counseling is very important because the Gaza Strip is going through persistent crises, especially wars. In addition to that, it must establish a permanent phone counseling unit or center.

-Improving the coordination between the Ministry of Health and other ministries like Ministry of Social Development to meet the basic needs during difficult periods.

-Improvement the follow up system for people with psychological disorders is very important in maintaining their mental health and preventing deterioration.

-A special committee for Post-Traumatic Stress Disorder (PTSD) is a crucial for immediate psychological interventions.

-Strengthening the evaluation system for the psychological services to make sure they achieve their goals.

5.2.2 Recommendations for further research

The following research studies are recommended

- To identify other possible risk factors of COVID-19 infection and their associations with severe infection.
- To explore the experiences of hospitalized COVID-19 patients including their clinical and laboratory findings, and management approach.
- To compare the efficiency and effectiveness of different COVID-19 vaccines.
- To compare first, second, and the third wave of COVID-19 epidemic regarding symptoms, severity, and risk factors.
- To examine the efficacy of coordination between MOH, UNRWA and NGOs in the contingency plan for COVID-19 epidemic to take advantage of it in the crises.
- To quantitatively evaluate the psychological services during COVID-19 epidemic.

References

Ahmad, J., Anwar, S., Latif, A., Haq, N. U., Sharif, M., & Nauman, A. A. (2020). The Association of PPE Availability, Training and Practices with COVID-19 Sero-prevalence in Nurses and Paramedics in Tertiary Care Hospitals of Peshawar, Pakistan. Disaster Medicine and Public Health Preparedness, 1–18.

Al Abri, Z. G. H., Al Zeedi, M. A. S. A., & Al Lawati, A. A. (2021). Risk Factors Associated with COVID-19 Infected Healthcare Workers in Muscat Governorate, Oman. Journal of Primary Care and Community Health, 12.

Alajmi, J., Jeremijenko, A. M., Abraham, J. C., Alishaq, M., Concepcion, E. G., Butt, A. A., & Abou-Samra, A. B. (2020). COVID-19 infection among healthcare workers in a national healthcare system: The Qatar experience. International Journal of Infectious Diseases, 100, 386–389.

Albahri, A. H., Alnaqbi, S. A., Alnaqbi, S. A., Alshaali, A. O., & Shahdoor, S. M. (2021). Knowledge, Attitude, and Practice Regarding COVID-19 Among Healthcare Workers in Primary Healthcare Centers in Dubai: A Cross-Sectional Survey, 2020. Frontiers in Public Health, 9(July), 1–11.

Almohammed, O. A., Aldwihi, L. A., Alragas, A. M., Almoteer, A. I., Gopalakrishnan, S., & Alqahtani, N. M. (2021). Knowledge, Attitude, and Practices Associated With COVID-19 Among Healthcare Workers in Hospitals: A Cross-Sectional Study in Saudi Arabia. Frontiers in Public Health, 9(July), 1–11.

Alqahtani, J., Oyelade, T., Aldhahir, A., Alghamdi, S., Almehmadi, M., Alqahtani, A., Quaderi, S., Mandal, S., & Hurst, J. (2020). Prevalence, severity and mortality associated with COPD and smoking in patients with COVID-19: A rapid systematic review and meta-analysis. PLoS ONE, 15(5), 1–13.

Alser, O., Alghoul, H., Alkhateeb, Z., Hamdan, A., Albarqouni, L., & Saini, K. (2021). Healthcare workers preparedness for COVID-19 pandemic in the occupied Palestinian territory: a cross-sectional survey. BMC Health Services Research, 21(1), 1–7.

Al Thobaity, A., & Alshammari, F. (2020). Nurses on the Frontline against the COVID-19 Pandemic: An Integrative Review. Dubai Medical Journal, 3(3), 87–92.

Al Youha, S., Alowaish, O., Ibrahim, I. K., Alghounaim, M., Abu-Sheasha, G. A., Fakhra, Z., Al Hendi, S., AlQabandi, Y., Almazeedi, S., Al Asoomi, F., & Al-Sabah, S. (2021). Factors associated with SARS-CoV-2 infection amongst healthcare workers in a COVID-19 designated hospital. Journal of Infection and Public Health, 14(9), 1226–1232.

American Psychiatric Association. (2020). *Depression.* Retrieved from: https://www.psychiatry.org/patients-families/depression/what-is-depression. Accessed on 25/12/2021.

American psychiatric Disorder. (2021). Anxiety Disorders. Retrieved from https://www.psychiatry.org/patients-families/anxiety-disorders/what-are-anxiety-disorders. Accessed on 25/12/2021.

Arshad, M., Hussain, I., Nafees, M., Majeed, A., Imran, I., Saeed, H., Hashmi, F., Akbar, M., Abrar, M. A., Ramzan, B., Chaudhry, M. O., Islam, M., Usman, A., Nisar, N., & Rasool, M. (2020). Assessing the Impact of COVID-19 on the Mental Health of Healthcare Workers in Three Metropolitan Cities of Pakistan. Psychology Research and Behavior Management, 13, 1047–1055.

Bandyopadhyay, S., Baticulon, R., Kadhum, M., Alser, M., Ojuka, D., Badereddin, Y., Kamath, A., Parepalli, S., Brown, G., Iharchane, S., Gandino, S., Markovic-Obiago, Z., Scott, S., Manirambona, E., Machhada, A., Aggarwal, A., Benazaize, L., Ibrahim, M., Kim, D., … Khundkar, R. (2020). Infection and mortality of healthcare workers worldwide from COVID-19: a systematic review. BMJ Global Health, 5(12), 2059-7908.

Boudin L, Janvier F, Bylicki O, Dutasta F.(2020) ABO blood groups are not associated with risk of acquiring the SARS-CoV-2 infection in young adults. Haematologica, 105(12).

Burrer, S., de Perio, M., Hughes, M., Kuhar, D., Luckhaupt, S., McDaniel, C., Porter, R., Silk, B., Stuckey, M., & Walters, M. (2020). Characteristics of Health Care Personnel with COVID-19 — United States, February 12–April 9, 2020.Morbidity and Mortality Weekly Report, 69(15), 477–481.

Cai, Z., Yang, Y., & Zhang, J. (2021). Obesity is associated with severe disease and mortality in patients with coronavirus disease 2019 (COVID-19): a meta-analysis. BMC Public Health, 21(1), 1–14.

Centers for Disease Control and Prevention.(2017). SARS-Associated Coronavirus Sequencing (SARS-CoV). Retrieved from https://www.cdc.gov/sars/lab/sequence. html.Accessed on 5/11/2020.

Centers for Disease Control and Prevention. (2020a). Management of Patients with Confirmed 2019-nCoV | CDC. Retrieved from https://www.cdc.gov/coronavirus/ 2019-ncov/hcp/clinical-guidance-management-patients.html. Accessed on 20/12/2020

Centers for Disease Control and Prevention. (2020b). How to Protect Yourself & Others. Retrieved from https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html. Accessed on 4/4/2021.

Centers for Disease Control and Prevention.(2021a). Science Brief: SARS-CoV-2 and Surface (Fomite) Transmission for Indoor Community Environments. Retrieved from https://www.cdc.gov/coronavirus/2019-ncov/more/science-and-research/surface-transmission.html. Accessed on 15/5/2021.

Centers for Disease Control and Prevention. (2021b). Interim Clinical Guidance for Management of Patients with Confirmed Coronavirus Disease (COVID-19). Retrieved from https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html. Accessed on 4/9/2021.

Centers for Disease Control and Prevention.(2021c). Pregnant and Recently Pregnant PeopleAt Increased Risk for Severe Illness from COVID-19. Retrieved from https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/pregnant-people.html. Accessed on 5/10/2021.

Centers for Disease Control and Prevention.(2021d). Different COVID-19 Vaccines. Retrieved from https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines.html. Accessed on 1/10/ 2021.

Centers of Disease Control and Prevention.(2021e). COVID-19 Stats: COVID-19 Incidence,* by Age Group† — United States, March 1–November 14, 2020. Retrieved from, https://www.cdc.gov/mmwr/volumes/69/wr/mm695152a8.htm. Accessed on 1/9/2021.

Centers of Disease Control and Prevention. (2021f). Quarantine and Isolation. Retrieved from,https://www.cdc.gov/coronavirus/2019-ncov/your-health/quarantine-isolation.html. Accessed on 18/11/2021.

Chen, T., Li, G., Liu, H., Wan, W., Zheng, H., & Chen, C. (2021). Clinical characteristics of 132 healthcare worker cases with COVID-19: A retrospective study from a single center in Wuhan, China. Journal of Medical Virology, 93(3), 1631–1638.

Cheng, M. P., Papenburg, J., Desjardins, M., Kanjilal, S., Quach, C., Libman, M., Dittrich, S., & Yansouni, C. P. (2020). Diagnostic Testing for Severe Acute Respiratory Syndrome-Related Coronavirus 2: A Narrative Review. Annals of Internal Medicine, 172(11), 726–734.

Chew, N., Lee, G., Tan, B., Jing, M., Goh, Y., Ngiam, N., Yeo, L., Ahmad, A., Ahmed Khan, F., Napolean Shanmugam, G., Sharma, A., Komalkumar, R., Meenakshi, P., Shah, K., Patel, B., Chan, B., Sunny, S., Chandra, B., Ong, J., … Sharma, V. (2020). A multinational, multicentre study on the psychological outcomes and associated physical symptoms amongst healthcare workers during COVID-19 outbreak. Brain, Behavior, and Immunity, 88, 559–565.

Colaneri, M., Sacchi, P., Zuccaro, V., Biscarini, S., Sachs, M., Roda, S., Pieri, T.,Valsecchi, P., Piralla, A., Seminari, E., Matteo, A. Di, Novati, S., Maiocchi, L., Pagnucco, L., Tirani, M., Baldanti, F., Mojoli, F., Perlini, S., Bruno, R., & San, I. (2020). Clinical characteristics of coronavirus disease (COVID-19) early findings from a teaching hospital in Pavia, North Italy, 21 to 28 February 2020. Eurosurveillance,25(16).

Courbage, Y., Abu Hamad, B., & Zagha, A. (2016). Palestine 2030 Demographic Change: Opportunities for Development.London: Prime minister's office – State of Palestine United Nations Population Fund, UNPFA.

da Rosa Mesquita, R., Francelino Silva Junior, L. C., Santos Santana, F. M., Farias de Oliveira, T., Campos Alcântara, R., Monteiro Arnozo, G., Rodrigues da Silva Filho, E., Galdino dos Santos, A. G., Oliveira da Cunha, E. J., Salgueiro de Aquino, S. H., & Freire de Souza, C. D. (2021). Clinical manifestations of COVID-19 in the general population: systematic review. Wiener Klinische Wochenschrift, 133(7–8), 377–382.

Dzik, S., Eliason, K., Morris, E. B., Kaufman, R. M., & North, C. M. (2020). COVID-19 and ABO blood groups. Transfusion, 60(8), 1883–1884.

Ellul, M., Benjamin, L., Singh, B., Lant, S., Michael, B., Easton, A., Kneen, R., Defres, S., Sejvar, J., & Solomon, T. (2020). Neurological associations of COVID-19. The Lancet Neurology , 19(9), 767–783.

El-Sokkary, R. H., El Seifi, O. S., Hassan, H. M., Mortada, E. M., Hashem, M. K., Gadelrab, M. R. M. A., & Tash, R. M. E. (2021). Predictors of COVID-19 vaccine hesitancy among Egyptian healthcare workers: a cross-sectional study. BMC Infectious Diseases, 21(1), 1–9.

Food and Drug Administration.(2020). Coronavirus (COVID-19) Update: FDA Authorizes Monoclonal Antibodies for Treatment of COVID-19. https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-fda-authorizes-monoclonal-antibodies-treatment-covid-19. Accessed on 21/12/ 2020.

Food and Drug Administration.(2021). COVID-19 vaccines. Retrieved from https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/covid-19-vaccines. Accessed on 22/10/ 2021.

Ganz-Lord, F. A., Segal, K. R., & Rinke, M. L. (2021). COVID-19 symptoms, duration, and prevalence among healthcare workers in the New York metropolitan area. Infection Control and Hospital Epidemiology, 42(8), 917–923.

Gao, Y. dong, Ding, M., Dong, X., Zhang, J. jin, Kursat Azkur, A., Azkur, D., Gan, H., Sun, Y. li, Fu, W., Li, W., Liang, H. ling, Cao, Y. yuan, Yan, Q., Cao, C., Gao, H. yu, Brüggen, M. C., van de Veen, W., Sokolowska, M., Akdis, M., & Akdis, C. A. (2021). Risk factors for severe and critically ill COVID-19 patients: A review. Allergy: European Journal of Allergy and Clinical Immunology, 76(2), 428–455.

Geng, M. J., Wang, L. P., Ren, X., Yu, J. X., Chang, Z. R., Zheng, C. J., An, Z. J., Li, Y., Yang, X. K., Zhao, H. T., Li, Z. J., He, G. X., & Feng, Z. J. (2021). Risk factors for developing severe COVID-19 in China: an analysis of disease surveillance data. Infectious Diseases of Poverty, 10(1), 1–10.

Guan, W., Ni, Z., Hu, Y., Liang, W., Ou, C., He, J., Liu, L., Shan, H., Lei, C., Hui, D. , Du, B., Li, L., Zeng, G., Yuen, K.-Y., Chen, R., Tang, C., Wang, T., Chen, P., Xiang, J., … Zhong, N. (2020). Clinical Characteristics of Coronavirus Disease 2019 in China. New England Journal of Medicine, 382(18), 1708–1720.

Guba, E. G. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. Educational Resources Information Center Annual Review Paper, 29, 75-91.

Hayes, P. (2020). Here's how scientists know the coronavirus came from bats and wasn't made in a lab. The Conversation. https://theconversation.com/heres-how-scientists-know-the-coronavirus-came-from-bats-and-wasnt-made-in-a-lab-141850

Htay, M. N. N., Marzo, R. R., Bahari, R., AlRifai, A., Kamberi, F., El-Abasiri, R. A., Nyamache, J. M., Hlaing, H. A., Hassanein, M., Moe, S., Abas, A. L., & Su, T. T. (2021). How healthcare workers are coping with mental health challenges during COVID-19 pandemic? - A cross-sectional multi-countries study. Clinical Epidemiology and Global Health, 11(February), 100759.

Huang, J., Han, M., Luo, T., Ren, A., & Zhou, X. (2020). Mental health survey of medical staff in a tertiary infectious disease hospital for COVID-19. Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi = Zhonghua Laodong Weisheng Zhiyebing Zazhi = Chinese Journal of Industrial Hygiene and Occupational Diseases, 38(3), 192–195.

Hussen, H., & Alemu, Z. A. (2021). Risk of covid-19 infection and associated factors among healthcare workers: A cross-sectional study at eka kotebe treatment center in Ethiopia. International Journal of General Medicine, 14, 1763–1772.

Ibekwe, T. S., Fasunla, A. J., & Orimadegun, A. E. (2020). Systematic Review and Meta-analysis of Smell and Taste Disorders in COVID-19. OTO Open, 4(3).

Jones, I., & Roy, P. (2021). Sputnik V COVID-19 vaccine candidate appears safe and effective. The Lancet, 397(10275), 642–643. https://doi.org/10.1016/S0140-6736(21)00191-4

Kahathuduwa, C., Dhanasekara, C., & Chin, S. (2020). Case fatality rate in COVID-19: A systematic review and meta-analysis. MedRxiv, 1–45

Kang, L., Li, Y., Hu, S., Chen, M., Yang, C., Yang, B. X., Wang, Y., Hu, J., Lai, J., Ma, X., Chen, J., Guan, L., Wang, G., Ma, H., & Liu, Z. (2020). The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. The Lancet Psychiatry , 7(3), e14.

KATELLA. K.(2021). Comparing the COVID-19 Vaccines: How Are They Different?. Retrieved from https://www.yalemedicine.org/news/covid-19-vaccine-comparison. Accessed on 29/10/2021.

Ko, J. Y., Danielson, M. L., Town, M., Derado, G., Greenlund, K. J., Kirley, P. D., Alden, N. B., Yousey-Hindes, K., Anderson, E. J., Ryan, P. A., Kim, S., Lynfield, R., Torres, S. M., Barney, G. R., Bennett, N. M., Sutton, M., Talbot, H. K., Hill, M., Hall, A. J., … George, A. (2021). Risk Factors for Coronavirus Disease 2019 (COVID-19)-Associated Hospitalization: COVID-19-Associated Hospitalization Surveillance Network and Behavioral Risk Factor Surveillance System. Clinical Infectious Diseases, 72(11), E695–E703.

Kordzadeh-Kermani, E., Khalili, H., & Karimzadeh, I. (2020). Pathogenesis, clinical manifestations and complications of coronavirus disease 2019 (COVID-19). Future Microbiology, 15(13), 1287–1305.

Kumar, G., Nanchal, R., Hererra, M., Sakhuja, A., Patel, D., Meersman, M., Dalton, D., & Guddati, A. K. (2021). Does ABO Blood Groups Affect Outcomes in Hospitalized COVID-19 Patients? Journal of Hematology, 10(3), 98–105.

Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., Wu, J., Du, H., Chen, T., Li, R., Tan, H., Kang, L., Yao, L., Huang, M., Wang, H., Wang, G., Liu, Z., & Hu, S. (2020). Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. JAMA Network Open, 3(3), e203976.

Liu, T., Liang, W., Zhong, H., He, J., Chen, Z., He, G., Song, T., Chen, S., Wang, P., Li, J., Lan, Y., Cheng, M., Huang, J., Niu, J., Xia, L., Xiao, J., Hu, J., Lin, L., Huang, Q., … Ma, W. (2020). Risk factors associated with COVID-19 infection: a retrospective cohort study based on contacts tracing. Emerging Microbes and Infections, 9(1), 546-1553.

Maechler, F., Gertler, M., Hermes, J., van Loon, W., Schwab, F., Piening, B., Rojansky, S., Hommes, F., Kausch, F., Lindner, A., Burock, S., Rössig, H., Hartmann, C., Kirchberger, V., Thieme, A., Behnke, M., Gastmeier, P., Mockenhaupt, F., & Seybold, J. (2020). Epidemiological and clinical characteristics of SARS-CoV-2 infections at a testing site in Berlin, Germany, March and April 2020—a cross-sectional study. Clinical Microbiology and Infection, 26(12), 1685.e7-1685.e12.

Mahamid, F.A., Veronese, G. and Bdier, D. (2021), "The Palestinian health-care providers' perceptions, challenges and human rights-related concerns during the COVID-19 pandemic", International Journal of Human Rights in Healthcare.

Maraqa, B., Nazzal, Z., Rabi, R., Sarhan, N., Al-Shakhrah, K., & Al-Kaila, M. (2021). COVID-19 vaccine hesitancy among health care workers in Palestine: A call for action. Preventive Medicine, 149(May), 106618.

Mayo Clinic Staff. (2021). Comparing the difference between COVID-19 vaccines. Retrieved from https://www.mayoclinic.org/coronavirus-covid-19/vaccine/comparing-vaccines. Accessed on 16/10/2021.

Medical Aid For Palestinians. (2021). Dealing With Death and Distress : the Impact of Covid-19 on the Mental Health of Palestinian. July. https://reliefweb.int/sites/reliefweb.int/files/resources/dealingwithdeathanddistress.pdf

Mendoza Millán, D. L., Carrión-Nessi, F. S., Mejía Bernard, M. D., Marcano-Rojas, M. V., Omaña Ávila, Ó. D., Doval Fernández, J. M., Chacón Labrador, F. R., Quintero Rodríguez, A., Gasparini Vega, S., Tami, A., Maricuto, A. L., Velásquez, V. L., Landaeta, M. E., Figuera, M., Chavero, M., Figuera, L., Camejo-Ávila, N. A., & Forero-Peña, D. A. (2021). Knowledge, Attitudes, and Practices Regarding COVID-19 Among Healthcare Workers in Venezuela: An Online Cross-Sectional Survey. Frontiers in Public Health, 9(July), 1–10.

Mental Health Foundation. (2021). Stress. Retrieved from https://www.mentalhealth.org.uk/a-to-z/s/stress. Accessed on 25/12/2021.

Mhango, M., Dzobo, M., Chitungo, I., & Dzinamarira, T. (2020). COVID-19 Risk Factors Among Health Workers: A Rapid Review. Safety and Health at Work, 11(3), 262–265.

Minder, R., & Peltier, E. (2020). Coronavirus in Europe: Thousands of Health Workers Out of Action. The New York Times.

Ministry of Health.(2009). Gaza European Hospital. Retrieved from https://www.moh.gov.ps/portal/مستشفى-غزة-الاوروبي/. Accessed on 18/11/2020.

Ministry of Health, General Directorate of Health Policies and Planning. (2016). National Health Strategy 2017-2022. State of Palestine , Ramallah: MOH.

Ministry of Health. (2020a). MOH-Gaza: Announcing the first COVID-19 community transmission in Gaza strip on Monday. Retrieved from https://www.moh.gov.ps/portal/moh-gaza-announcing-the-first-covid-19-community-transmission-in-gaza-strip-on-monday/. Accessed on 11/10/2020

Ministry of Health. (2020b). Coronavirus (COVID-19) in Palestine. Retrieved from https://corona.ps/. Accessed on 16/12/2020.

Ministry of Health.(2020c). CoronVirus-Report-July-2020. Retrieved from https://www.moh.gov.ps/portal/تقرير-أداء-وزارة-الصحة-في-مواجهة-جائحة/. Accessed on 5/7/2021.

Ministry of Health, Health Information Unit.(2020d). Human Resources Report.State of Palestine.

Ministry of Health.(2021a). Coronavirus(COVID-19) in Palestine. Retrieved from https://corona.ps. Accessed on 6/11/2021.

Ministry of Health. (2021b). Annual Report 2020 - Palestinian Ministry of Health - Southern Governorates - Gaza Strip. Retrieved from https://www.moh.gov.ps/portal/التقرير-السنوي-لوزارة-الصحة-الفلسطينية-قطاع-غزة-2020/. Accessed on 1/8/2021.

Ministry of Health. (2021c). CORONAVIRUS- COVID19 Surveillance System. Retrieved from http://site.moh.ps/index/covid19. Accessed on 11/11/2021.

Ministry of Health. (2021d). A special report on the performance and achievements of the Ministry of Health. Retrieved from https://www.moh.gov.ps/portal/تقرير-أداء-وإنجازات-وزارة-الصحة-النصف/. Accessed on 11/11/2021.

NIH.(2021). COVID-19 Treatment Guidelines-Corticosteriods. Retrieved from https://www.covid19treatmentguidelines.nih.gov/therapies/immunomodulators/corticosteroids/.

Novak, N., Peng, W., Naegeli, M. C., Galvan, C., Kolm-Djamei, I., Brüggen, C., Cabanillas, B., Schmid-Grendelmeier, P., & Catala, A. (2021). SARS-CoV-2, COVID-19, skin and immunology – What do we know so far? Allergy: European Journal of Allergy and Clinical Immunology, 76(3), 698–713.

Osman, A., Wong, J., Bagge, C., Freedenthal, S., Gutierrez, P., & Lozano, G. (2012). The Depression Anxiety Stress Scales-21 (DASS-21): Further Examination of Dimensions, Scale Reliability, and Correlates. Journal of Clinical Psychology, 68(12), 1322–1338.

Paleiron, N., Mayet, A., Marbac, V., Perisse, A., Barazzutti, H., Brocq, F. X., Janvier, F., Dautzenberg, B., & Bylicki, O. (2021). Impact of Tobacco Smoking on the Risk of COVID-19: A Large Scale Retrospective Cohort Study. Nicotine & Tobacco Research : Official Journal of the Society for Research on Nicotine and Tobacco, 23(8), 1398–1404.

Palestinian Central Bureau of Statistics.(2018). Number of Hospitals, Hospital Beds, and Beds per 1000 Citizens in Palestine by Region, 2018. Retrieved from https://www.pcbs.gov.ps/Portals/_Rainbow/Documents/health-2018-002A.html.

Palestinian Central Bureau of Statistics.(2019a). PCBS: On the occasion of the International Population Day 11/7/2019. Retrieved from https://www.pcbs.gov.ps/post.aspx?lang=en&ItemID=3503. Accessed on 6/11/2021.

Palestinian Central Bureau of Statistics. (2019b). PCBS: On the Eve occasion of May 1st - International labour Day.Retrieved from http://pcbs.gov.ps/post.aspx?lang=en&ItemID=3453. Accessed on 30/10/2020.

Palestinian Centre For Humen Rights. (2020). PCHR Warns of Health Sector Collapse and Suspension of Health Services in the Gaza . Retrived from https://www.pchrgaza.org/en/pchr-warns-of-health-sector-collapse-and-suspension-of-health-services-in-the-gaza-strip/. Accessed on 2/12/2020.

Pan American Health Organization, & World Health Organization. (2020). Epidemiological Alert: COVID-19 among health workers - 31 August 2020 - PAHO/WHO | Pan American Health Organization. August. https://www.paho.org/en/documents/epidemiological-alert-covid-19-among-health-workers-31-august-2020. Accessed on 10/10/2021.

Pan American Health Organization, & World Health Organization. (2021). Epidemiological Update: Coronavirus disease (COVID-19) (21 August 2021). Retrieved from https://iris.paho.org/handle/10665.2/54717. Accessed on 18/11/2021.

Pareek, M., Bangash, M., Pareek, N., Pan, D., Sze, S., Minhas, J., Hanif, W., & Khunti, K. (2020). Ethnicity and COVID-19: an urgent public health research priority. The Lancet, 395(10234), 1421–1422.

Pedrozo-Pupo, J., Pedrozo-Cortés, M., & Campo-Arias, A. (2020). Perceived stress associated with COVID-19 epidemic in Colombia: an online survey. Cad. Saúde Pública 2020; 36(5):E00090520.

Pullen, M., Skipper, C., Hullsiek, K., Bangdiwala, A., Pastick, K., Okafor, E., Lofgren, S., Rajasingham, R., Engen, N., Galdys, A., Williams, D., Abassi, M., & Boulware, D. (2020). Symptoms of COVID-19 Outpatients in the United States. Open Forum Infectious Diseases, 7(7).

Rozenfeld, Y., Beam, J., Maier, H., Haggerson, W., Boudreau, K., Carlson, J., & Medows, R. (2020). A model of disparities: Risk factors associated with COVID-19 infection. International Journal for Equity in Health, 19(1), 1–10.

Samrah, S. , Al-Mistarehi, A., Ibnian, A., Raffee, L., Momany, S., Al-Ali, M., Hayajneh, W., Yusef, D., Awad, S., & Khassawneh, B. (2020). COVID-19 outbreak in Jordan: Epidemiological features, clinical characteristics, and laboratory findings. Annals of Medicine and Surgery, 57, 103–108.

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(1), 1–13.

Silva-filho, J. C., Germoglio, C., Melo, F. De, Lima, J., & Oliveira, D. (2020). Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID- 19 . The COVID-19 resource centre is hosted on Elsevier Connect , the company ' s public news and information . Medical Hypotheses, Januar.

Simonnet, A., Chetboun, M., Poissy, J., Raverdy, V., Noulette, J., Duhamel, A., Labreuche, J., Mathieu, D., Pattou, F., Jourdain, M., Caizzo, R., Caplan, M., Cousin, N., Duburcq, T., Durand, A., El kalioubie, A., Favory, R., Garcia, B., Girardie, P., … Verkindt, H. (2020). High Prevalence of Obesity in Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) Requiring Invasive Mechanical Ventilation. Obesity, 28(7), 1195–1199.

Sun, P., Wang, M., Song, T., Wu, Y., Luo, J., Chen, L., & Yan, L. (2021). The Psychological Impact of COVID-19 Pandemic on Health Care Workers: A Systematic Review and Meta-Analysis. Frontiers in Psychology, 12(July).

Tamang, N., Rai, P., Dhungana, S., & Sherchan, B. (2020). COVID-19 : A National Survey on Perceived Level of Knowledge , Attitude and Practice among Frontline Medical Professionals in Nepal. BMC Public Health, 20(1905), 1–10.

The Lancet Diabetes & Endocrinology. (2020). COVID-19 and diabetes: a co-conspiracy? The Lancet Diabetes and Endocrinology, 8(10), 801.

Tian, Y., Rong, L., Nian, W., & He, Y. (2020). Review article: gastrointestinal features in COVID-19 and the possibility of faecal transmission. Alimentary Pharmacology and Therapeutics, 51(9), 843–851.

United Nations. (2020). Coronavirus Disease 2019 (COVID-19) WHO Update 41 - Question of Palestine. Retrieved from https://www.un.org/unispal/document/coronavirus-disease-2019-COVID-19-who-update-41/. Accessed on 20/9/2021.

Wacharapluesadee, S., Tan, C. W., Maneeorn, P., Duengkae, P., Zhu, F., Joyjinda, Y., Kaewpom, T., Chia, W. N., Ampoot, W., Lim, B. L., Worachotsueptrakun, K., Chen, V. C. W., Sirichan, N., Ruchisrisarod, C., Rodpan, A., Noradechanon, K., Phaichana, T., Jantarat, N., Thongnumchaima, B., … Wang, L. F. (2021). Evidence for SARS-CoV-2 related coronaviruses circulating in bats and pangolins in Southeast Asia. Nature Communications, 12(1).

Wang, B., Li, R., Lu, Z., & Huang, Y. (2020). Does comorbidity increase the risk of patients with COVID-19: evidence from meta-analysis. Aging, 12(7), 6049–6057.

Wang, J., Zhou, M., & Liu, F. (2020). Reasons for healthcare workers becoming infected with novel coronavirus disease 2019 (COVID-19) in China. The Journal of Hospital Infection ,105(1),100–101.

Wang, M. W., Wen, W., Wang, N., Zhou, M. Y., Wang, C. Y., Ni, J., Jiang, J. J., Zhang, X. W., Feng, Z. H., & Cheng, Y. R. (2021). COVID-19 Vaccination Acceptance Among Healthcare Workers and Non-healthcare Workers in China: A Survey. Frontiers in Public Health, 9(August), 1–8.

World Health Organization. (2020a). Naming the coronavirus disease (COVID-19) and the virus that causes it. Retrieved from https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-(covid-2019)-and-the-virus-that-causes-it. Accessed on 2/10/ 2020.

World Health Organization. (2020b). Coronavirus Disease 2019 Situation Report 51 - 11th March 2020. Retrieved from https://www.who.int/emergencies/diseases/novel-coronavirus-2019. Accessed on 11/10/ 2020.

World Health Organization. (2020c). Weekly epidemiological update - 15 December 2020. Retrieved from https://www.who.int/publications/m/item/weekly-epidemiological-update---15-december-2020. Accessed on 30/12/ 2020.

World Health Organization. (2020d). Novel coronavirus outbreak in China – What does it mean for Europe?. Retrieved from https://www.euro.who.int/en/health-topics/health-emergencies/international-health-regulations/news/news/2020/2/novel-coronavirus-outbreak-in-china-what-does-it-mean-for-europe. Accessed on 1/10/2020.

World Health Organization. (2020e). Modes of transmission of virus causing COVID-19: implications for IPC precaution recommendations. Geneva: World Health Organization;, March, 19–21. Retrieved from https://doi.org/10.1056/NEJMc2004973 Chen. Accessed on 27/10/2020.

WHO; UNDP. (2020f). COVID-19 and NCD risk factors. 15(5), 2019–2020.Retrieved from: https://www.undp.org/sites/g/files/zskgke326/files/publications/Infographic%20NCDs%20and%20COVID-19.pdf.

World Health Organazation. (2020g). Clinical management of COVID-19. Retrieved from https://www.who.int/publications/i/item/clinical-management-of-covid-19. Accessed on 25/10/2020.

World Health Organization. (2020h). WHO COVID-19 Case definition. Updated in Public Health Surveillance for COVID-19, December 16, 1. Retrieved from file:///C:/Users/tsc/Downloads/WHO-2019-nCoV-Surveillance_Case_Definition-2020.2-eng%20(5).pdf. Accessed on 24/12/2021.

World Health Organisation.(2021a). COVID-19 weekly epidemiological update, 58, 1–23. https://www.who.int/publications/m/item/covid-19-weekly-epidemiological-update. Accessed on 6/11/2021.

World Health Organization.(2021b). COVAX Working for global equitable access to COVID-19 vaccines. retrieved from https://www.who.int/initiatives/act-accelerator/covax. Accessed on 2/10/2021.

World Health Organization. (2021c). The Oxford/AstraZeneca COVID-19 vaccine: what you need to know. Retrieved from https://www.who.int/news-room/feature-stories/detail/the-oxford-astrazeneca-covid-19-vaccine-what-you-need-to-know?gclid=CjwKCAiA1aiMBhAUEiwACw25MSlpH1E6FOS1U6kJeo7HCNYlRWA2CvyB6XuUeSS3Klhmj_OLqwpaWRoCiRMQAvD_BwE. Accessed on 30/9/2021.

World Health Organization.(2021d). On new recommendation for treatment of COVID-19 patients: WHO calls for equitable access to casirivimab and imdevimab for COVID-19.Retrieved from https://www.who.int/news/item/24-09-2021-on-new-recommendation-for-treatment-of-covid-19-patients-who-calls-for-equitable-access-to-casirivimab-and-imdevimab-for-covid-19. Accessed on 24/10/2021.

World Health Organization.(2021e). Coronavirus disease (COVID-19) advice for the public: Mythbusters. Retrieved from https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-forpublic/mythbusters?gclid=Cj0KCQjw5oiMBhDtARIsAJi0qk1odP1XeGZbxDnl7Awaa4OHQEJZ4_Us1UQk-fK99P9UkYSn40XUkDwaAoS1EALw_wcB#garlic. Accessed on 5/9/2021.

World Health Organisation. (2021f). Vaccine efficacy, effectiveness and protection. Retreived from https://www.who.int/news-room/feature-stories/detail/vaccine-efficacy-effectiveness-and-protection. Accessed on 17/11/2021.

Wu, Z., & McGoogan, J. (2020). Characteristics of and Important Lessons from the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72314 Cases from the Chinese Center for Disease Control and Prevention. JAMA - Journal of the American Medical Association, 323(13), 1239–1242.

Yang, Y., Lu, L., Chen, T., Ye, S., Kelifa, M. O., Cao, N., Zhang, Q., Liang, T., & Wang, W. (2021). Healthcare worker's mental health and their associated predictors during the epidemic peak of covid-19. Psychology Research and Behavior Management, 14, 221–231.

Zhao, J., Yang, Y., Huang, H., Li, D., Gu, D., Lu, X., Zhang, Z., Liu, L., Liu, T., Liu, Y., He, Y., Sun, B., Wei, M., Yang, G., Wang, X., Zhang, L., Zhou, X., Xing, M., & Wang, P. G. (2020). Relationship between the ABO Blood Group and the COVID-19 Susceptibility. Clinical Infectious Diseases, 328.

Zhang, Y., Garner, R., Salehi, S., La Rocca, M., & Duncan, D. (2021). Association between ABO blood types and coronavirus disease 2019 (COVID-19), genetic associations, and underlying molecular mechanisms: a literature review of 23 studies. Annals of Hematology, 100(5), 1123–1132.

Zhou, H., Chen, X., Hu, T., Li, J., Song, H., Liu, Y., Wang, P., Liu, D., Yang, J., Holmes, E. C., Hughes, A. C., Bi, Y., & Shi, W. (2020). A Novel Bat Coronavirus Closely Related to SARS-CoV-2 Contains Natural Insertions at the S1/S2 Cleavage Site of the Spike Protein. Current Biology, 30(11), 2196-2203.e3.

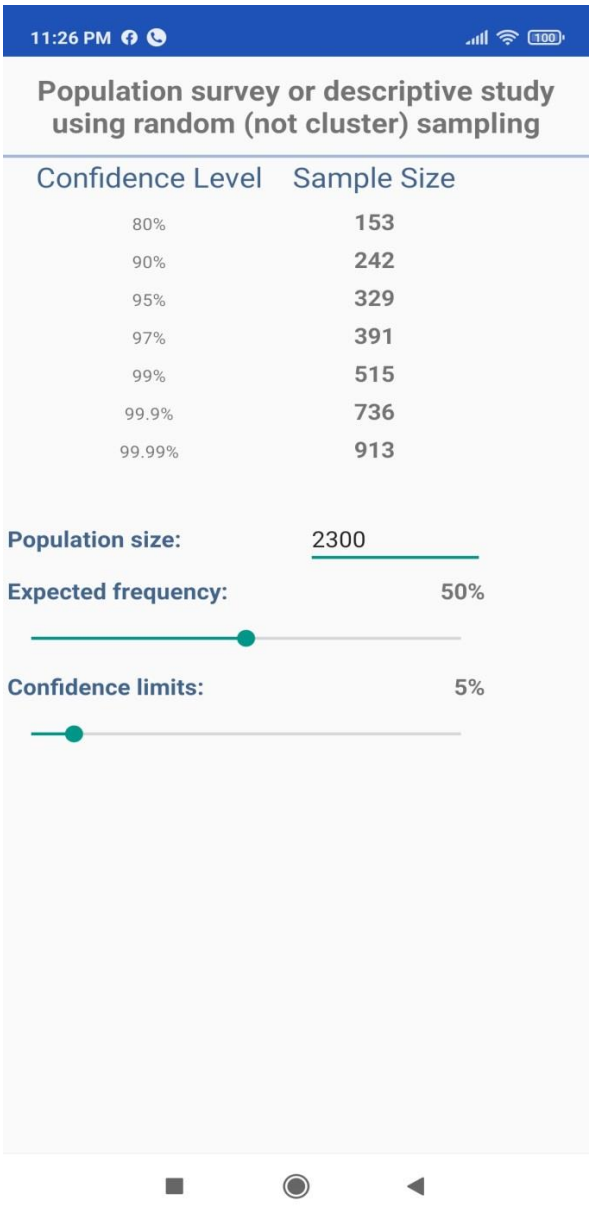
Zhu, N., Zhang, D., Wang, W., Li, X., Yang, B., Song, J., Zhao, X., Huang, B., Shi, W., Lu, R., Niu, P., Zhan, F., Ma, X., Wang, D., Xu, W., Wu, G., Gao, G. F., & Tan, W. (2020). A Novel Coronavirus from Patients with Pneumonia in China, 2019. New England Journal of Medicine, 382(8), 727–733.

Annexes

Annex (1): Time schedule

Time	Action
October, November and December /2020	Writing proposal
January /2021	Defense
February /2021	Helsinki Committee
March /2021	Designing the instrument
April/ 2021	Expert committee check for validity of instrument
May /2021	Pilot study and modifications
June/ 2021	MOH approval
July/2021	Other ethical approval for obtaining personal data of infected medical staff
August, Mid-September /2021	Data collection
Mid-September, October /2021	Data entry and analysis
November /2021	Results and conclusions
December /2021	Committee discussion

Annex (2): Epi Info for calculation of sample size.



Annex (3): The questionnaire and informed consent

Experiences of Health Staff Who Tested COVID-19 Positive in the Gaza Strip

I'm Dina A. Abu Hamed, a master scholar of Al Quds University – Abu Dies in epidemiology of Public Health Master Program. I am conducting a study to identify knowledge, attitudes, practices, psychological impact and coping strategies among health staff who were confirmed COVID-19 positive in the Gaza Strip. This is to have a better understanding of the challenges they faced and to help in providing recommendations that might promote medical staff wellbeing with its positive consequences on the society as a whole.

The researcher would like to emphasize that there are no right or wrong answers, and the approval of the Ministry of Health was taken to conduct the study, and the sample was chosen randomly.

The data that you will share will be treated with strict confidentiality, as it will only be used in the analysis according to the instructions and ethics approved for scientific research.

Your participation in the study is voluntary and we greatly appreciate it, and you have the right to withdraw from the study at any time.

Thank you in advance for your participation, which requires 20 minutes of your time.

For any inquiries, please contact the following email: dina.hamed@students.alquds.edu

Demographic Data

- Gender ☐Male ☐Female
- Age: 30 and younger, 31-40, 41-50, older than 50
- Marital status: married, single, divorced, widow
- Governorate: North Gaza, Gaza, Middle, Khan Younis, Rafah
- Job Title: Physician, pharmacist, Nurse, Lab technician, Radiologist, others
- Mention your profession if it is not in the list: …
- Work Place: Hospital, PHC
- Department: internal medicine, surgery, Obstetrics and Gynecology
- pediatric, emergency, ICU, corona medical unit, others
- Educational level: Diploma, Bachelor, Master, Board, others
- Years of experience: ……..

COVID-19 INFECTION	
Date Of COVID-19 infection	----------
Have you provided direct care to COVID-19 patients?	Yes No
Workplace with COVID1-9 patients	quarantine Isolation Hospital Isolation Department Triage Tent Intensive care unit Others
Number of days you worked with infected patients	……
COVID-19 symptoms and severity	
Did you have COVID-19 symptoms?	Yes No

If yes, choose the symptoms you have got among the list

	yes	no	not sure
headache			
dizziness			
fever			
chills			
Dry cough			
Cough with sputum			
Shortness of breath			
Chest pain			
Sore throat			
Runny nose			
fatigue			
Abdominal pain			
vomiting			

	diarrhea			
	Loss of smell			
	Loss of taste			
	numbness			
	Muscle pain, back pain			
	Rash			
	others			
List other symptoms you have suffered if they are not in the list	.....			
If you had symptoms, which one did start first	.....			
When did it start from the date of infection	14 13 12 11 10 9 8 7 6 5 4 3 2 1			
Which one was the last	.....			
When did the symptoms disappear since the date of first symptoms appearance?	.....			
Regarding the severity of infection, which one did you need	☐ Supportive therapy at home ☐ Hospital admission ☐ Didn't need any treatment			
COVID-19 Trainings				
Have you received formal training on how to deal with COVID-19 patients?	☐ Yes ☐ No			
Have you received formal training on donning and doffing PPE properly?	☐ Yes ☐ No			
Have you received formal training about infection control procedures?	☐ Yes ☐ No			
How many trainings did you receive	☐ ----------			
Do you think these trainings were enough to prepare you to fight this pandemic and prevent infection?	☐ Yes ☐ No ☐ Not sure			
COVID-19 RISK FACTORS				
Smoking status	☐ Smoker ☐ Smoking Nargila ☐ Passive smoker ☐ Not smoker			
If you are a smoker, how many cigarettes per day?	…….			
Pregnant during the COVID-19 infection	☐ yes ☐ no ☐ not sure			
What is your blood group?	☐ A ☐ B			

	☐ AB ☐ O

Regarding your health condition, which one do you have?		yes	no	don't know
	Diabetes			
	Hypertension			
	Obesity			
	Respiratory disease (asthma, COPD,)			
	Kidney disease			
	Liver disease			
	Thyroid			
	Cardiac disease			
	Blood disease			
	cancer			
	Others			
	None			

COVID-19 VACCINATION	
Have you received COVID-19 vaccination	☐ yes ☐ no
If the answer is no, why didn't take the vaccine till now?	☐ ----------
Your Vaccine type	☐ Sputnik ☐ Pfizer ☐ AstraZeneca ☐ Sino pharm ☐ Moderna ☐ others
Were infected with COVID-19 after receiving vaccine?	☐ Yes ☐ No ☐ Not sure
If yes, you were infected after the	☐ First dose ☐ Second dose
First dose date Second dose date	☐ ..... ☐ .....
Assessment of COVID-19 knowledge, attitudes and practices	
Do you have previous information about COVID-19	☐ yes ☐ no
If yes, what was the source of information	☐ Radio, TV ☐ Social media ☐ By virtue of study and specialization ☐ Internet websites

	☐ Scientific articles ☐ Awareness flyers by the competent authorities ☐ Family and friends' discussions ☐ Medical centers and staff ☐ others
Do you believe in the conspiracy theory regarding the SARS CoV 2 virus?	☐ yes ☐ no ☐ Not sure
If the answer is yes, which of these theories do you think is correct?	☐ SARS CoV 2 virus does not really exist ☐ SARS CoV 2 virus is a biological weapon that was made in a laboratory on purpose ☐ SARS CoV 2virus appeared by mistake as the virus leaked from a Chinese laboratory ☐ SARS CoV 2 virus is a political game between major countries ☐ SARS CoV 2virus is a purely economic war to manufacture and promote vaccines

Medical staff Knowledge about COVID-19			
	yes	no	don't know
SARS CoV 2 virus is thought to be originated from bats.			
SARS CoV 2 virus is transmitted through respiratory droplets and touching the infected surfaces			
Loss of smell and taste is a feature of COVID-19 infection			
Incubation period of COVID-19 is 1-14 days			
There is no cure for COVID-19 till now			
Hot weather reduces the spread of COVID-19 infection.			
Children do not have to wear a medical mask and follow preventive methods			
Herbal remedies like eating garlic, anise tea and ginger can prevent/treat COVID-19 infection			
Prednisone should be given for all symptomatic patients even admitted or not.			
Health staff attitude toward COVID-19 infection			
	yes	no	don't know
I think face mask prevents the transmission of the virus			
I think vaccination protects against infection			
I think vaccination reduces the death rate from the COVID-19			
I think SARS CoV 2 virus is simple and does not need any precautionary measure			

I think that the governmental actions to face COVID-19 pandemic were correct and appropriate					
I think a comprehensive closure is effective in controlling the epidemic					
Health Staff Practices during COVID-19 infection					
	always	often	some times	rarely	never
Washing my hands with water and soap					
Using hand sanitizers					
Wearing surgical mask					
Wearing PPE (gown, face shield, goggles……)					
Following social distance at least 1 meter					
dealing with every patient inside medical center that he has COVID-19 infection.					
reading about the COVID-19 infection constantly and following updates					
Avoiding participating in weddings and funeral homes					
Avoiding public markets					
Avoiding social visits and visiting patients					

Regarding PPE adherence, what types of PPE do you use in your work?					
	always	often	sometimes	rarely	never
Gloves					
Surgical mask					
Cloth mask					
N95 mask					
Disposable gown					
Full body PPE suit					
Eye protection goggles					
Face shield					
Hand sanitizers					
Water and soap after examining patients for at least 20 sec					

Do you feel that the personal protective equipment available in your workplace is sufficient to protect you from COVID-19 infection?	☐ yes ☐ no

Psychological impact of COVID-19 infection on health staff					
Factors that cause fear and stress during COVID-19 infection					
	strongly disagree	disagree	neutral	agree	strongly agree
I felt anxious as a result of the conflict between					

my professional and moral duty, and my personal safety					
I felt anxious as a result of my COVID-19 infection and its future impact on my health					
I was worried about the risk of transmitting the virus to my family and friends					
I was worried about how my colleagues and community members looked at me after COVID-19 infection (social stigma)					
I felt anxious as a result of my absence from work while I was infected with the virus					
I was concerned about the increase number of COVID-19 cases and deaths					
I was worried about the shortage of medical staff					
I was worried about the inadequacy of COVID-19 information					
I was concerned about the lack of trained medical staff to deal with COVID-19 patients					
I was worried about the lack of medical supplies and intensive care beds					
I was worried that there was no cure for COVID-19 infection					
I was worried about being isolated and being separated from my family					
factors that contributed to reduce anxiety and stress caused by your COVID-19 infection					
	strongly disagree	disagree	neutral	agree	strongly agree
family support					
Friends and co-workers support					

Management's appreciation of infected medical staff					
Taking a vacation for treatment and rest					
psychological support					
The possibility of receiving financial compensation for your infection					
Taking care of your family and meeting their needs during your infection period					
The likelihood of receiving your family a financial compensation in the event of death as a result of work infection					

What was your coping strategies for stress management?	☐ Doing relaxation activities such as meditation, deep breathing, sports ☐ Sleeping ☐ Communication with friends and family through social media ☐ Having support from my fellows ☐ Religious and Spiritual Practices ☐ Watching TV ☐ listening to music ☐ Reliance on rational cognition in dealing with disease ☐ Talking to myself and encouraging myself to overcome this disease ☐ Expression of my feelings by crying, screaming, etc. ☐ Cutting off all media that publishes the number of infected people and deaths related to the virus
Mention the other strategies that you have used to relieve the psychological stress caused by your infection with the virus, if they are not on the list?	....

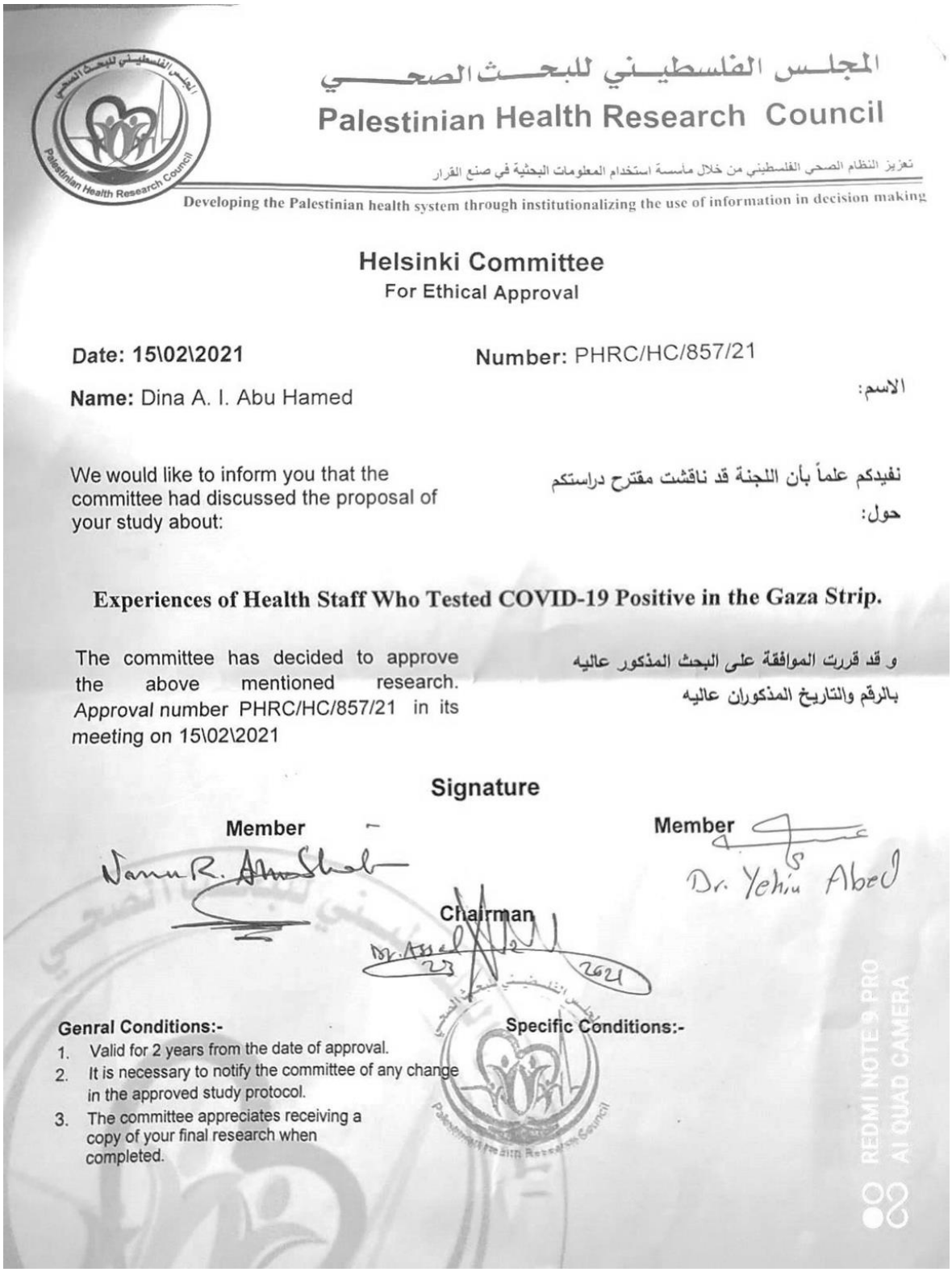
Depression, Anxiety, Stress Scale (DASS-21)

(DASS-21) The rating scale is as follows: 0 Did not apply at all, To some degree, or some of the time, 2 To a considerable degree, or a good part of time, 3 Very much, or most of the time

	0	1	2	3
I found it hard to wind down				

I felt dryness of my mouth				
I couldn't seem to experience any positive feeling at all				
I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)				
I found it difficult to work up the initiative to do things				
I tended to over-react to situations				
I experienced trembling (e.g. in the hands)				
I felt that I was using a lot of nervous energy				
I was worried about situations in which I might panic and make a fool of myself				
I felt that I had nothing to look forward to				
I found myself getting agitated				
I found it difficult to relax				
I felt down-hearted and blue				
I was intolerant of anything that kept me from getting on with what I was doing				
I was close to panic				
I was unable to become enthusiastic about anything				
I felt I wasn't worth much as a person				
I felt that I was rather touchy				
I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)				
I felt scared without any good reason				
I felt that life was meaningless				

Annex (4): Helsinki



المجلس الفلسطيني للبحث الصحي

Palestinian Health Research Council

تعزيز النظام الصحي الفلسطيني من خلال مأسسة استخدام المعلومات البحثية في صنع القرار

Developing the Palestinian health system through institutionalizing the use of information in decision making

Helsinki Committee

For Ethical Approval

Date: 15\02\2021 **Number:** PHRC/HC/857/21

Name: Dina A. I. Abu Hamed الاسم:

We would like to inform you that the committee had discussed the proposal of your study about: نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:

Experiences of Health Staff Who Tested COVID-19 Positive in the Gaza Strip.

The committee has decided to approve the above mentioned research. *Approval number* PHRC/HC/857/21 *in its meeting on* 15\02\2021 و قد قررت الموافقة على البحث المذكور عاليه بالرقم والتاريخ المذكوران عاليه

Signature

Member **Member**

Dr. Yehia Abed

Chairman

Genral Conditions:-

1. Valid for 2 years from the date of approval.
2. It is necessary to notify the committee of any change in the approved study protocol.
3. The committee appreciates receiving a copy of your final research when completed.

Specific Conditions:-

Annex (5): MOH Approval letter

State of Palestine
Ministry of health

دولة فلسطين
وزارة الصحة

السيد : رامي عيد العبادله المحترم

التاريخ:22/06/2021

رقم المراسلة 712867

مدير عام بالوزارة /الإدارة العامة لتنمية القوى البشرية/وزارة الصحة

السلام عليكم ,,,

الموضوع/ تسهيل مهمة الباحثة/ د. دينا أبو حامد

التفاصيل //
بخصوص الموضوع أعلاه، يرجي تسهيل مهمة الباحثة/ **د. دينا أحمد أبو حامد**
الملتحقة ببرنامج ماجستير الصحة العامة – مسار علم الأوبئة ـ جامعة القدس أبو ديس بغزة في إجراء بحث بعنوان:
"Experiences of Health Staff Who Tested COVID-19 Positive in the Gaza Strip"
حيث الباحث بحاجه لتعبة استبانة من عدد من مقدمي الخدمات الصحية الذين اصيبوا بمرض كوفيد 19 اضافة لعقد مقابلات معمقة مع عدد ممن قدم الخدمات الصحة النفسية لهم، بما لا يتعارض مع مصلحة العمل وضمن أخلاقيات البحث العلمي ودون تحمل الوزارة أي أعباء أو مسئولية.
وتفضلوا بقبول التحية والتقدير،
ملاحظة /
1. الدراسة اعلاه حاصلة على موافقة لجنة اخلاقيات البحث الصحي
2. تسهيل المهمة الخاص بالدراسة أعلاه صالح لمدة 6 أشهر من تاريخه.

محمد ابراهيم السرساوي
مدير دائرة/الإدارة العامة لتنمية القوى البشرية

Annex (6): Correct answers of knowledge and attitude questions

Knowledge	**Correct answer**	**Number (percentage)**
SARS CoV 2 virus is thought to be originated from bats.	Yes	206(53%)
SARS CoV 2 virus is transmitted through respiratory droplets and touching the infected surfaces	Yes	326(83.8%)
Loss of smell and taste is a feature of COVID-19 infection	Yes	375 (96.4%)
Incubation period of COVID-19 is 1-14 days	Yes	364 (93.6%)
There is no effective cure for COVID-19	yes	267 (68.6%)
Hot weather reduces the spread of COVID-19 infection.	No	240 (61.7%)
Children do not have to wear a medical mask and follow preventive methods	No	288 (74%)
Herbal remedies like eating garlic, anise tea and ginger can prevent/treat infection	No	125 (32%)
Prednisone should be given for all symptomatic patients even admitted or not	No	174 (44.7%)
Attitude	**Positive Attitude**	
I think face mask prevents the transmission of the virus	Agree	336 (86.4%)
I think vaccination protects against infection	Agree	183 (47. 3%)
I think vaccination reduces the mortality rate from COVID-19 infection	Agree	294 (75.6%)
I think the SARS CoV 2 virus is simple and does not need any precautionary measure	Disagree	351 (90.2%)
I think that the government's measures in the Gaza Strip to confront the COCID-19 pandemic were correct and appropriate	Agree	177 (45.5%)
I think a comprehensive closure is effective in controlling the epidemic	Agree	274 (70. 4%)

Annex (7): Post Hoc test for association between PPE adherence and governorate

Multiple Comparisons					
LSD					
Dependent Variable	**(I) Governorate**	**(J) Governorate**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**
PPE Score	North	Gaza	2.36083	1.97201	.232
		Middle	1.04457	2.19769	.635
		Khan Younis	-2.57220	2.17303	.237
		Rafah	-4.37376	2.47164	.078
	Gaza	North	-2.36083	1.97201	.232
		Middle	-1.31626	1.80612	.467
		Khan Younis	-4.93303	1.77603	.006
		Rafah	-6.73459	2.13102	.002
	Middle	North	-1.04457	2.19769	.635
		Gaza	1.31626	1.80612	.467
		Khan Younis	-3.61677	2.02368	.075
		Rafah	-5.41833	2.34142	.021
	Khan Younis	North	2.57220	2.17303	.237
		Gaza	4.93303	1.77603	.006
		Middle	3.61677	2.02368	.075
		Rafah	-1.80156	2.31829	.438
	Rafah	North	4.37376	2.47164	.078
		Gaza	6.73459	2.13102	.002
		Middle	5.41833	2.34142	.021
		Khan Younis	1.80156	2.31829	.438

Annex (8): Post Hoc test for association between KAP, PPE adherence, DAS and job title

Multiple Comparisons					
LSD					
Dependent Variable	(I) Job Title	(J) Job Title	Mean Difference (I-J)	Std. Error	Sig.
Practice score	Physician	pharmacist	-2.14658	3.01617	.477
		Nurse	-5.53444*	1.45758	.000
		Lab technician	-3.76967	2.47119	.128
		Radiologist	-.50623	3.68833	.891
		Other	2.84710	2.69131	.291
	pharmacist	Physician	2.14658	3.01617	.477
		Nurse	-3.38785	2.91173	.245
		Lab technician	-1.62309	3.52993	.646
		Radiologist	1.64035	4.46737	.714
		Other	4.99368	3.68738	.176
	Nurse	Physician	5.53444*	1.45758	.000
		pharmacist	3.38785	2.91173	.245
		Lab technician	1.76476	2.34258	.452
		Radiologist	5.02821	3.60343	.164
		Other	8.38154*	2.57373	.001
	Lab technician	Physician	3.76967	2.47119	.128
		pharmacist	1.62309	3.52993	.646
		Nurse	-1.76476	2.34258	.452
		Radiologist	3.26344	4.11909	.429
		Other	6.61677*	3.25673	.043
	Radiologist	Physician	.50623	3.68833	.891
		pharmacist	-1.64035	4.46737	.714
		Nurse	-5.02821	3.60343	.164

		Lab technician	-3.26344	4.11909	.429
		Other	3.35333	4.25480	.431
	Other	Physician	-2.84710	2.69131	.291
		pharmacist	-4.99368	3.68738	.176
		Nurse	-8.38154*	2.57373	.001
		Lab technician	-6.61677*	3.25673	.043
		Radiologist	-3.35333	4.25480	.431
PPE Score	Physician	pharmacist	10.27054*	3.03497	.001
		Nurse	-4.69303*	1.46667	.001
		Lab technician	-4.85680	2.48659	.052
		Radiologist	-3.30841	3.71132	.373
		Other	-.10841	2.70809	.968
	pharmacist	Physician	-10.27054*	3.03497	.001
		Nurse	-14.96356*	2.92989	.000
		Lab technician	-15.12733*	3.55194	.000
		Radiologist	-13.57895*	4.49522	.003
		Other	-10.37895*	3.71037	.005
	Nurse	Physician	4.69303*	1.46667	.001
		pharmacist	14.96356*	2.92989	.000
		Lab technician	-.16377	2.35719	.945
		Radiologist	1.38462	3.62589	.703
		Other	4.58462	2.58977	.077
	Lab technician	Physician	4.85680	2.48659	.052
		pharmacist	15.12733*	3.55194	.000
		Nurse	.16377	2.35719	.945
		Radiologist	1.54839	4.14477	.709
		Other	4.74839	3.27704	.148
	Radiologist	Physician	3.30841	3.71132	.373
		pharmacist	13.57895*	4.49522	.003

		Nurse	-1.38462	3.62589	.703
		Lab technician	-1.54839	4.14477	.709
		Other	3.20000	4.28132	.455
	Other	Physician	.10841	2.70809	.968
		pharmacist	10.37895*	3.71037	.005
		Nurse	-4.58462	2.58977	.077
		Lab technician	-4.74839	3.27704	.148
		Radiologist	-3.20000	4.28132	.455
Anxiety	Physician	pharmacist	-.45647	1.09958	.678
		Nurse	-2.42219*	.53138	.000
		Lab technician	-1.68737	.90090	.062
		Radiologist	-.38629	1.34462	.774
		Other	-.51963	.98115	.597
	pharmacist	Physician	.45647	1.09958	.678
		Nurse	-1.96572	1.06150	.065
		Lab technician	-1.23090	1.28688	.339
		Radiologist	.07018	1.62863	.966
		Other	-.06316	1.34428	.963
	Nurse	Physician	2.42219*	.53138	.000
		pharmacist	1.96572	1.06150	.065
		Lab technician	.73482	.85401	.390
		Radiologist	2.03590	1.31367	.122
		Other	1.90256*	.93828	.043
	Lab technician	Physician	1.68737	.90090	.062
		pharmacist	1.23090	1.28688	.339
		Nurse	-.73482	.85401	.390
		Radiologist	1.30108	1.50166	.387
		Other	1.16774	1.18728	.326
	Radiologist	Physician	.38629	1.34462	.774

		pharmacist	-.07018	1.62863	.966
		Nurse	-2.03590	1.31367	.122
		Lab technician	-1.30108	1.50166	.387
		Other	-.13333	1.55113	.932
	Other	Physician	.51963	.98115	.597
		pharmacist	.06316	1.34428	.963
		Nurse	-1.90256*	.93828	.043
		Lab technician	-1.16774	1.18728	.326
		Radiologist	.13333	1.55113	.932
Depression	Physician	pharmacist	-.84358	1.04880	.422
		Nurse	-1.76909*	.50684	.001
		Lab technician	.55200	.85930	.521
		Radiologist	.17835	1.28253	.889
		Other	.26168	.93584	.780
	pharmacist	Physician	.84358	1.04880	.422
		Nurse	-.92551	1.01249	.361
		Lab technician	1.39559	1.22745	.256
		Radiologist	1.02193	1.55343	.511
		Other	1.10526	1.28220	.389
	Nurse	Physician	1.76909*	.50684	.001
		pharmacist	.92551	1.01249	.361
		Lab technician	2.32109*	.81458	.005
		Radiologist	1.94744	1.25301	.121
		Other	2.03077*	.89496	.024
	Lab technician	Physician	-.55200	.85930	.521
		pharmacist	-1.39559	1.22745	.256
		Nurse	-2.32109*	.81458	.005
		Radiologist	-.37366	1.43232	.794
		Other	-.29032	1.13246	.798

	Radiologist	Physician	-.17835	1.28253	.889
		pharmacist	-1.02193	1.55343	.511
		Nurse	-1.94744	1.25301	.121
		Lab technician	.37366	1.43232	.794
		Other	.08333	1.47951	.955
	Other	Physician	-.26168	.93584	.780
		pharmacist	-1.10526	1.28220	.389
		Nurse	-2.03077*	.89496	.024
		Lab technician	.29032	1.13246	.798
		Radiologist	-.08333	1.47951	.955
DAS	Physician	pharmacist	-1.61584	2.31337	.485
		Nurse	-5.06820*	1.11795	.000
		Lab technician	-1.32891	1.89538	.484
		Radiologist	-.95794	2.82892	.735
		Other	-.81794	2.06421	.692
	pharmacist	Physician	1.61584	2.31337	.485
		Nurse	-3.45236	2.23327	.123
		Lab technician	.28693	2.70742	.916
		Radiologist	.65789	3.42643	.848
		Other	.79789	2.82819	.778
	Nurse	Physician	5.06820*	1.11795	.000
		pharmacist	3.45236	2.23327	.123
		Lab technician	3.73929*	1.79674	.038
		Radiologist	4.11026	2.76380	.138
		Other	4.25026*	1.97403	.032
	Lab technician	Physician	1.32891	1.89538	.484
		pharmacist	-.28693	2.70742	.916
		Nurse	-3.73929*	1.79674	.038
		Radiologist	.37097	3.15931	.907

		Other	.51097	2.49788	.838
	Radiologist	Physician	.95794	2.82892	.735
		pharmacist	-.65789	3.42643	.848
		Nurse	-4.11026	2.76380	.138
		Lab technician	-.37097	3.15931	.907
		Other	.14000	3.26339	.966
	Other	Physician	.81794	2.06421	.692
		pharmacist	-.79789	2.82819	.778
		Nurse	-4.25026*	1.97403	.032
		Lab technician	-.51097	2.49788	.838
		Radiologist	-.14000	3.26339	.966
*. The mean difference is significant at the 0.05 level.					

Annex (9): Post Hoc test for association between attitude, PPE adherence, anxiety and department

Multiple Comparisons					
LSD					
Dependent Variable	(I) Department	(J) Department	Mean Difference (I-J)	Std. Error	Sig.
attitude_score01	Internal medicine	Surgery	6.63043	3.95505	.095
		Obstetrics and Gynecology	10.49796	3.98208	.009
		Pediatric	5.25947	4.25106	.217
		Emergency	11.35266	4.17339	.007
		ICU	1.32556	3.92916	.736
		Corona medical unit	.89514	4.13750	.829
	Surgery	Internal medicine	-6.63043	3.95505	.095
		Obstetrics and Gynecology	3.86752	4.11683	.348
		Pediatric	-1.37097	4.37754	.754
		Emergency	4.72222	4.30215	.273
		ICU	-5.30488	4.06567	.193
		Corona medical unit	-5.73529	4.26734	.180
	Obstetrics and Gynecology	Internal medicine	-10.49796	3.98208	.009
		Surgery	-3.86752	4.11683	.348
		Pediatric	-5.23849	4.40197	.235
		Emergency	.85470	4.32701	.844
		ICU	-9.17240	4.09197	.026
		Corona medical unit	-9.60282	4.29241	.026
	Pediatric	Internal medicine	-5.25947	4.25106	.217
		Surgery	1.37097	4.37754	.754
		Obstetrics and Gynecology	5.23849	4.40197	.235
		Emergency	6.09319	4.57576	.184
		ICU	-3.93391	4.35416	.367
		Corona medical unit	-4.36433	4.54305	.338
	Emergency	Internal medicine	-11.35266	4.17339	.007
		Surgery	-4.72222	4.30215	.273
		Obstetrics and Gynecology	-.85470	4.32701	.844
		Pediatric	-6.09319	4.57576	.184
		ICU	-10.02710	4.27837	.020
		Corona medical unit	-10.45752	4.47046	.020
	ICU	Internal medicine	-1.32556	3.92916	.736
		Surgery	5.30488	4.06567	.193

		Obstetrics and Gynecology	9.17240	4.09197	.026
		Pediatric	3.93391	4.35416	.367
		Emergency	10.02710	4.27837	.020
		Corona medical unit	-.43042	4.24337	.919
	Corona medical unit	Internal medicine	-.89514	4.13750	.829
		Surgery	5.73529	4.26734	.180
		Obstetrics and Gynecology	9.60282	4.29241	.026
		Pediatric	4.36433	4.54305	.338
		Emergency	10.45752	4.47046	.020
		ICU	.43042	4.24337	.919
PPE_Score	Internal medicine	Surgery	1.56304	2.58649	.546
		Obstetrics and Gynecology	-2.29208	2.60417	.380
		Pediatric	-.79663	2.78007	.775
		Emergency	-2.14756	2.72928	.432
		ICU	-9.40403	2.56956	.000
		Corona medical unit	-6.79284	2.70581	.013
	Surgery	Internal medicine	-1.56304	2.58649	.546
		Obstetrics and Gynecology	-3.85513	2.69229	.153
		Pediatric	-2.35968	2.86279	.411
		Emergency	-3.71061	2.81349	.188
		ICU	-10.96707	2.65883	.000
		Corona medical unit	-8.35588	2.79073	.003
	Obstetrics and Gynecology	Internal medicine	2.29208	2.60417	.380
		Surgery	3.85513	2.69229	.153
		Pediatric	1.49545	2.87877	.604
		Emergency	.14452	2.82975	.959
		ICU	-7.11194	2.67603	.008
		Corona medical unit	-4.50075	2.80712	.110
	Pediatric	Internal medicine	.79663	2.78007	.775
		Surgery	2.35968	2.86279	.411
		Obstetrics and Gynecology	-1.49545	2.87877	.604
		Emergency	-1.35093	2.99242	.652
		ICU	-8.60740	2.84750	.003
		Corona medical unit	-5.99620	2.97103	.045
	Emergency	Internal medicine	2.14756	2.72928	.432
		Surgery	3.71061	2.81349	.188

		Obstetrics and Gynecology	-.14452	2.82975	.959
		Pediatric	1.35093	2.99242	.652
		ICU	-7.25647	2.79794	.010
		Corona medical unit	-4.64528	2.92356	.113
	ICU	Internal medicine	9.40403	2.56956	.000
		Surgery	10.96707	2.65883	.000
		Obstetrics and Gynecology	7.11194	2.67603	.008
		Pediatric	8.60740	2.84750	.003
		Emergency	7.25647	2.79794	.010
		Corona medical unit	2.61119	2.77504	.348
	Corona medical unit	Internal medicine	6.79284	2.70581	.013
		Surgery	8.35588	2.79073	.003
		Obstetrics and Gynecology	4.50075	2.80712	.110
		Pediatric	5.99620	2.97103	.045
		Emergency	4.64528	2.92356	.113
		ICU	-2.61119	2.77504	.348
Anxiety	Internal medicine	Surgery	.62391	1.00869	.537
		Obstetrics and Gynecology	-3.37737	1.01558	.001
		Pediatric	-.74544	1.08418	.492
		Emergency	-.90184	1.06437	.398
		ICU	-.32609	1.00209	.745
		Corona medical unit	-.03197	1.05522	.976
	Surgery	Internal medicine	-.62391	1.00869	.537
		Obstetrics and Gynecology	-4.00128	1.04995	.000
		Pediatric	-1.36935	1.11644	.221
		Emergency	-1.52576	1.09721	.166
		ICU	-.95000	1.03690	.360
		Corona medical unit	-.65588	1.08834	.547
	Obstetrics and Gynecology	Internal medicine	3.37737	1.01558	.001
		Surgery	4.00128	1.04995	.000
		Pediatric	2.63193	1.12267	.020
		Emergency	2.47552	1.10355	.026
		ICU	3.05128	1.04361	.004
		Corona medical unit	3.34540	1.09473	.002
	Pediatric	Internal medicine	.74544	1.08418	.492
		Surgery	1.36935	1.11644	.221

		Obstetrics and Gynecology	-2.63193	1.12267	.020
		Emergency	-.15640	1.16700	.893
		ICU	.41935	1.11048	.706
		Corona medical unit	.71347	1.15865	.539
	Emergency	Internal medicine	.90184	1.06437	.398
		Surgery	1.52576	1.09721	.166
		Obstetrics and Gynecology	-2.47552	1.10355	.026
		Pediatric	.15640	1.16700	.893
		ICU	.57576	1.09115	.598
		Corona medical unit	.86988	1.14014	.446
	ICU	Internal medicine	.32609	1.00209	.745
		Surgery	.95000	1.03690	.360
		Obstetrics and Gynecology	-3.05128	1.04361	.004
		Pediatric	-.41935	1.11048	.706
		Emergency	-.57576	1.09115	.598
		Corona medical unit	.29412	1.08222	.786
	Corona medical unit	Internal medicine	.03197	1.05522	.976
		Surgery	.65588	1.08834	.547
		Obstetrics and Gynecology	-3.34540	1.09473	.002
		Pediatric	-.71347	1.15865	.539
		Emergency	-.86988	1.14014	.446
		ICU	-.29412	1.08222	.786

عنوان الدراسة: المعرفة والمواقف والادراك والممارسات والعوامل النفسية واستراتيجيات التأقلم بين العاملين في مجال الرعاية الصحية الذين ثبتت اصابتهم بفيروس كورونا في قطاع غزة.

إعداد: دينا أحمد إسماعيل أبو حامد

إشراف: أ.د. عبد الرؤوف المناعمة

ملخص الدراسة:

خلفية الدراسة: سبب وباء كورونا خسائر فادحة في حياة العديد من العاملين في مجال الرعاية الصحية، حيث إنه أرهق النظام الصحي والقوى العاملة الصحية، بالإضافة إلى أنه سبب عبئًا نفسيًا ثقيلًا على الطاقم الطبي.
هدف الدراسة: تهدف الدراسة الى التعرف على معرفة وتوجهات وسلوكيات الطواقم الطبية الذين أصيبوا بفيروس كورونا في قطاع غزة كما تهدف الى التعرف على الأثر النفسي للإصابة ووسائل التأقلم التي اتبعوها خلال فترة الإصابة، لاكتساب فهم أفضل للصعوبات التي واجهوها وتحديد احتياجاتهم الأساسية من أجل تعزيز صحتهم الجسدية والنفسية مع تأثيرها الإيجابي على المجتمع ككل.
طرق اجراء الدراسة: تم استخدام الطريقة الكمية لجمع البيانات من المشاركين من خلال استبيان عبر الإنترنت.
اشتملت الدراسة على 389 من الكادر الطبي الذين وافقوا على ملء الاستبيان.
نتائج الدراسة: يمثل الذكور 54.8٪ من المشاركين، 44٪ منهم 30 سنة فأقل، 73.5٪ متزوجون، 71.5٪ حاصلون على درجة البكالوريوس، الممرضون شكلوا 50.1٪، 81.2٪ من المشاركين يعملون في المستشفيات، غالبية المشاركين (95.4 ٪) لديهم أعراض فيروس كورونا؛ كانت الأعراض الخمسة الأكثر شيوعًا هي الصداع، والتعب، والسعال، وآلام العضلات والظهر، بالإضافة إلى ارتفاع درجة الحرارة (86.5٪، 85.2٪، 76.6٪، 73.3٪،72.5٪ على التوالي)، مثلت نسبة فقدان حاسة الشم حوالي (68.5٪)، فقدان حاسة التذوق (59.3٪)، التهاب الحلق (61.2٪)، سيلان الأنف (43.1٪)، ضيق التنفس (39.9٪)، آلام في الصدر (38.5٪)، إسهال (46.1٪)، آلام في البطن (32.1٪)، قيء (14.3٪)، بالإضافة الى الطفح الجلدي (3.2٪). حصل غالبية المشاركين في الدراسة (81.0٪) على علاج داعم في المنزل، و6.2٪ احتاجوا إلى دخول المستشفى. 66.4٪من المشاركين تلقوا تدريباً على ارتداء وخلع معدات الوقاية الشخصية بشكل صحيح، و82.9٪ تلقوا تدريباً رسمياً على إجراءات مكافحة العدوى. 52.6٪ قالوا إن هذه التدريبات لم تكن كافية، وفيما يتعلق بعوامل الخطر كان 10٪ مدخنين، و12٪ حوامل، و12.9٪ يعانون من السمنة، و8.5٪ يعانون من ارتفاع ضغط الدم، و4.9٪ مصابين بالسكري، و2.6٪ يعانون من أمراض الجهاز التنفسي، و2.6٪ يعانون من أمراض الكبد، و1.5٪ يعانون من أمراض الغدة الدرقية، يتمتع المشاركون بمستوى معرفة مقبول بمتوسط درجة 67.55 بينما كان متوسط درجة التوجه 69.02. كانت ممارسات المشاركين جيدة جدًا بمتوسط درجة 82.34، وفقًا للالتزام بمعدات الحماية الشخصية في مكان العمل، كان متوسط الالتزام 63.04. سجل التمريض أعلى الدرجات في ممارسة الإجراءات الوقائية، كان الذكور وتقنيو المختبر هم أكثر الفئات التي التزمت بمعدات الحماية الشخصية، كان قسم العناية المركزة القسم الأكثر التزامًا بمعدات الوقاية الشخصية، كانت النساء والممرضات والعاملون في مجال الرعاية الصحية في المستشفيات أكثر الناس قلقًا واكتئابًا، كشفت النتائج عن عدم وجود علاقة بين فصيلة الدم والإصابة الشديدة بفيروس كورونا.

على مقياس الاكتئاب والقلق والتوتر (DASS-21)، كان معدل انتشار الاكتئاب بين المشاركين 32.4٪ (17.5٪ خفيف، 14.1٪ متوسط، 0.8٪ شديد)، كان القلق 54٪ (19٪ خفيف، 22.4٪ متوسط ، 12.6) ٪ شديد) بينما كان انتشار الضغط العصبي 33.7٪ (28.5٪ خفيف، 5.2٪ متوسط)، وأظهرت نتائج الدراسة أن القلق من انتقال عدوى كورونا إلى العائلات كان المصدر الأكثر شيوعًا للقلق والتوتر بين الطواقم الطبية (المتوسط=80.2)، كان دعم الأسرة هو العامل الأكثر شيوعًا الذي ساهم في تقليل التوتر (المتوسط=87)، اعتمد معظم المشاركين استراتيجيات التأقلم الإيجابية خلال فترة الإصابة، كانت الأنشطة الروحية والدينية هي أكثر استراتيجيات المواجهة شيوعًا (94.6٪).

توصيات الدراسة: في ضوء هذه النتائج، يوصى بتعزيز برامج التدريب حول إجراءات مكافحة العدوى والالتزام بمعدات الحماية الشخصية، بالإضافة إلى تكريم الطواقم الطبية ماديا ومعنويا تقديرا لجهودهم وتحسين حملات التوعية بالتطعيم، بالإضافة إلى تنفيذ برامج مستمرة طويلة المدى لجلسات توعوية وجلسات دعم نفسي، يعد تدريب الأخصائيين النفسيين على الاستشارة عبر الهاتف أمرًا مهمًا للغاية خاصة في الأزمات، كما أوصت الدراسة بتحسين التنسيق بين وزارة الصحة والوزارات الأخرى لتقديم الخدمات أفضل، كما أوصت الدراسة بتحسين نظام المتابعة ونظام التقييم للخدمات النفسية.