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Policies to Protect Healthcare Providers in Public Hospitals in Egypt Amid the First Wave Covid-19 Crisis: A Case Study

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ABSTRACT

The emergence of coronavirus disease 2019 (COVID-19) pandemic in 2020 became a main public health problem among the worlds. Universally, healthcare workers were forced to face an unprecedented challenge since the outbreak COVID-19. The World Health Organization (WHO) has been trying to reduce transmission of COVID-19 between different countries by setting regulations and standards in attempt to control the transmission of infection. The protection of healthcare workers working as frontline workers for COVID-19 is a priority. To assess the occupational workplace policies to protect healthcare workers in public university hospitals in Egypt during the first wave of COVID-19, this research was conducted at a major public university hospital. These policies were crucial to protect the frontline workers from COVID-19 infection amid the first wave of COVID-19. In depth interviews were conducted to gather information about the current policies in the case study hospital. Results of this research are vital to all public hospitals which provide service a large segment of the population in Egypt. Defective implementation of the workplace policies, lack of needed managerial support, and poor communication between the administration and the healthcare workers were highlighted. The challenge of substandard infrastructure and insufficient resources in the healthcare system during the pandemic at the case study contributed to the crisis. Additionally, the absence of psychological and mental health support needed to health care workers amid the ongoing stress of COVID-19 with all the mental challenges they are facing. The findings of this research give insights to the protective workplace policies of COVID-19 for healthcare workers at the case study public hospitals and challenges in their application and different policy alternatives.

Key words: COVID-19, WHO, health care workers.

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Chapter One: Introduction

For a better understanding of the policies to protect the healthcare workers amid the COVID-19 pandemic, this exploratory research is designed to examine the challenges of implementing different policies in Egypt to reduce the risk of infection of the front liners and to discuss the efficiency of the COVID-19 policies and strategies in protecting the healthcare workers. This research is aiming to give in-depth explanation to the policies implemented in hospitals in Egypt.

Two years ago in December 2019, there was an outbreak of respiratory disease that started in Wuhan, China and then reached the whole world comprising Egypt. This outbreak of this novel Coronavirus caused a huge economic and health problem worldwide. The new virus was labelled by World Health Organization (WHO) as "Severe Acute Respiratory Syndrome Coronavirus-2(SARS-CoV-2) and the disease called Coronavirus disease 2019(COVID-19)" (Acter et al, 2020).

Most of the signs indicate that applying policies to reduce COVID-19 spread as social distancing mandates is crucial slow the spread of COVID-19. This policy is consensus about the importance of proper policies in reduction of the new cases (Courtemanche et al, 2020).

The health care workers were at the frontline to face COVID-19. They had to receive the patients at the hospitals and treat them, despite the fact that there were no available data about the emerging viral infection or the impact of the infection. Also, there were not enough knowledge about the proper treatment, or the proper methods of protection from the infection (Vessey & Betz 2020).

The emergence of pandemics calls for vigilance that goes beyond the infection prevention measures inside hospitals. It encompasses implementation of proper surveillance system to allow early detection of positive cases of COVID-19, as well as continuous research to find evidence-based treatments and research for vaccine developments (Chu et al, 2020) (Bagcchi, 2021).

The disastrous mismanagement of the Egyptian public health care system has been going on for decades leaving ill-equipped hospitals with underfunds to deal with the uprising pandemic, the world bank statistics for Egypt indicate that Egypt has nearly 1.6 beds for every thousand people which is much less than the WHO standard of 5 beds per 1000 individuals (World Bank, 2014). This high workload for doctors as well as the indecent working circumstances led to immigration of doctors up to 110,000 registered doctors outside Egypt by the Egyptian Medical Syndicate official numbers (Abd El-Galil, 2019).

1.1 The COVID-19 pandemic Challenges to health care workers:

The COVID-19 is a major concern for health care workers and protecting the health care workers from the infection is a high priority for most of the countries. Thereby, working on making policies to reduce the COVID-19 infection rates among people and health care workers is crucial to sustain the stability of health care systems as well as protection of people and reduction of infections rates with COVID-19 (Adams & Walls, 2020).

The health care workers have several concerns that need to be assured while doing their jobs: helping COVID-19 patients and taking good care of them. The health care systems were overwhelmed with many challenges that arise with working on COVID-19 patients. Health care providers felt exhausted and swamped with substantial workloads. The fear of catching the infection and spreading it to loved ones. To add on, the feeling helpless to treat patients' conditions in this demanding state (Liu et al, 2020).

Amid the challenges faced by the health care providers, there is a rising urge to improve mental health and psychological well-being of health care workers (Xiao et al, 2020)

There are numerous methods of social support to health care workers such as providing psychological support sessions through trained psychiatrists (Houghton et al, 2020).

In the COVID-19 era in Egypt, the healthcare workers mortality rate is relatively high in comparison to other countries according to the medical syndicate official numbers. The death toll for physicians exceeded 600, which requires the implementation of more protective policies to healthcare workers (Egyptian Streets, 2021).

1.2 RESEARCH OBJECTIVES

This research is investigating the current policies to protect healthcare workers amid the first wave in Egypt after the COVID-19 pandemic and the action plan done by the government to reduce the rapid spread of the pandemic among healthcare workers and reduce the tremendous impact the pandemic had on the healthcare workers.

The research is studying a large public hospital to focus on the application of protective occupational COVID-19 policies to protect health care workers including the availability of the personal protective equipment, the training of health care workers, the availability of COVID-19 diagnostic tests and isolation hospitals for health care workers with insurance and decent incentives.

Most research studies emphasis on the medical aspect which focuses on discovery of better treatment or developing vaccine to COVID-19. Nevertheless, they lack the discussion of the policies that could be applied to protect the front liners and their effectiveness. Therefore, we are focusing on the assessment of the COVID-19 occupational policies to protect health care workers.

1.3 Conceptual framework:

Conceptual framework comprises a group of concepts that explain the method required to form contexts based on the grounded theory (Jabareen, 2009). Analysis of conceptual framework helps us to understand the know-how and the difference between theories and the existing facts. (Finney & Corbett, 2007).

At the outset of the pandemic, the healthcare workers were at very high risk of contracting the COVID-19 infection with its ambiguity as well as its dangers and rising death toll, added to the anxiety they faced to do their job. Nevertheless, there was gradual setting up of policies

for protection of health care workers from COVID-19 which reduced the fear and concerns about their safety and helped improve their care for patients (Ohta et al, 2021). The importance of conceptual analysis to the COVID-19 situation is to help analyze the preparations for COVID-19 by healthcare workers as well as the negative feelings and the challenges feelings they faced (Kelley et al, 2021).

The conceptual framework for this thesis can be alleged through assessment of the occupational policies to protect health care workers in a public hospital to tackle COVID-19 during the first wave. The research will assess the understanding of impact of COVID-19 pandemic by the health care workers amid the pressure and the lack of proper funding and the duty to be the frontliner hospitals to deal with COVID-19 patients. The research will assess the policies they implemented to protect their healthcare workers and the impact of implementation of those policies on protection of health care workers. Additionally, assessment of the implementation of those policies according to the judgement of the stake holders or the health care professionals in this case. The public hospitals serve the community as well as having the duty to protect their own healthcare workers.

This hospital is one of the oldest hospitals in Egypt. It is deemed the largest tertiary public medical institution in the Middle East. It is comprising 36 departments, more than 40 specialized units, 5820 beds 80% for free which serves more than 2 million patients annually, 3500 staff members.

Figure (1): Three main themes for this study

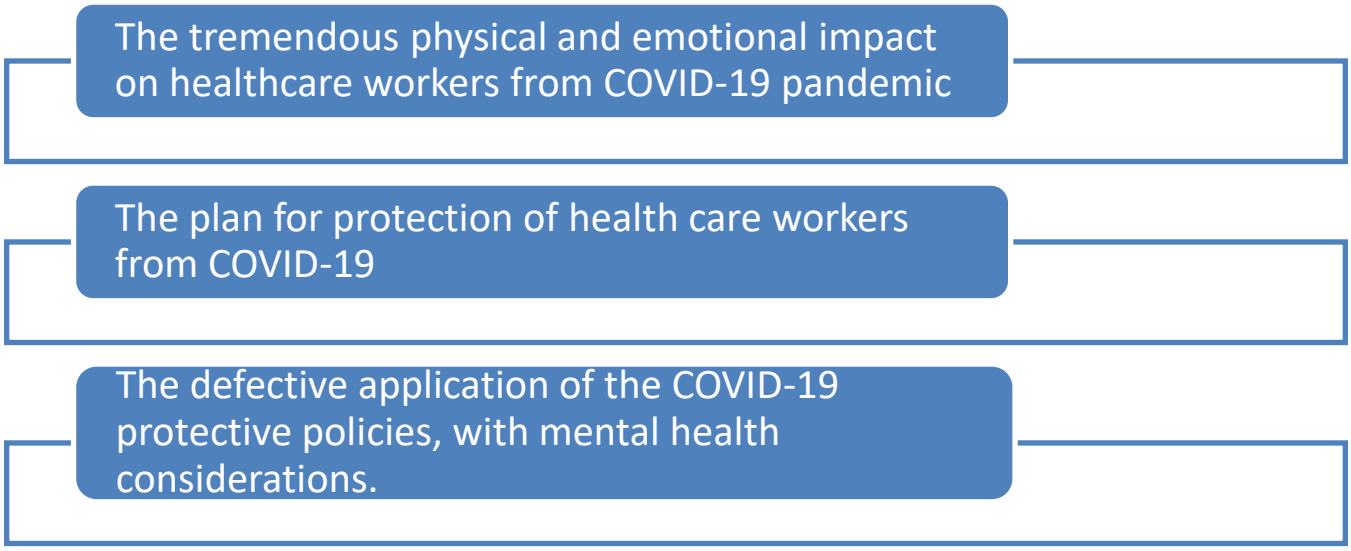
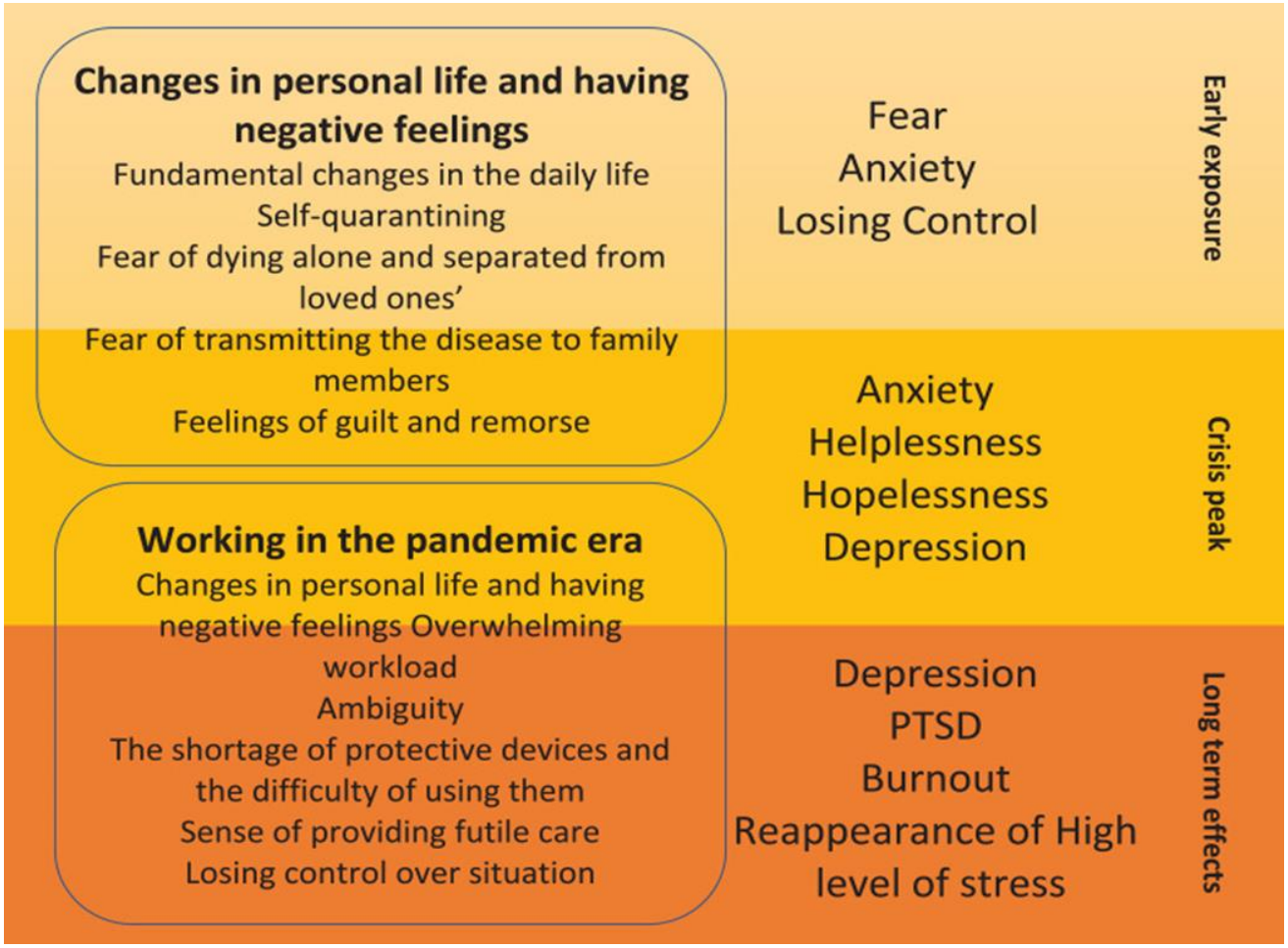


Figure (2): The three-stage model of mental health of health care workers



(Ardebili et al, 2020).

The figure shows the mental changes and challenges the healthcare workers encountered at every stage of the pandemic era from changes early in the pandemic, to challenges amid the crisis then the consequences of the pandemic to the long-term effects combated by the frontliners for long term after the pandemic.

1.4 RESEARCH QUESTIONS:

Grounded on the objectives, the proposed research question could be stated as the following:

What were the occupational protective policies applied in the case study hospitals during the first wave of COVID-19 pandemic in Egypt? What was the efficiency of implementing the policies and protecting their healthcare workers?

1.5 Research outline

The thesis is composed of five chapters. The first chapter covers the introduction which provides a glimpse about the crisis of the emerging pandemic COVID-19, role of healthcare systems to contain the pandemic and protect the healthcare systems. The introduction also presents the research objectives, research questions and conceptual framework. Chapter two presents the literature of review which tackles the problem and its consequences on healthcare workers; in addition to the policies implemented worldwide and in Egypt to contain the pandemic and protect

the frontliners. The third chapter illustrates diverse qualitativemethodologies and SWOT analysis. The data analysis and the findings are discussed in chapter four. Finally, the conclusion of the study and the recommendations are presented in the last chapter.

Chapter Two: Literature Review

The review of literature will discuss the following points in detail; The pandemic impact on healthcare workers, also the COVID-19 Protective Occupational Policies for health care workers:, Protection of Healthcare workers, the mental health and staff support during COVID-19, in addition to the COVID-19 protective policies in Egypt and finally we will discuss policies relevance of implementing right policies to face COVID-19.

2.1 The pandemic impact on healthcare workers

Healthcare workers are always at extreme risk of getting infected with infectious diseases when they take care of their patients which makes it crucial to enforce suitable safety measures in advance of the arrival of any pandemic (Union petition, 2005).

The West African epidemic of Ebola emerged between 2014 to 2016 and led to overwhelming effects on the health care workers as well as the health care systems as well. Thereby, it was crucial to mitigate the risk factors focusing on the infection control measures to assure the safety of health care workers and patients correspondingly. The repeated infections of health care workers raise alarms about the global emergency to reveal the weakness in the protective procedures globally (Wilkason et al, 2020).

The different outbreaks including the influenza H1N1 2009 pandemic as well as the Ebola in west Africa and Congo Republic from 2014 to 2016 and many other outbreaks as the swine flu and others that occur repeatedly have a significant impact on health care workers; especially that hospitals and doctors act as reservoir for different infection and the health care

facilities act as super spreaders to infections between health care workers and patients simultaneously (Frieden& Lee, 2020).

The protection of health care workers who are fearlessly treated COVID-19 patients in hospitals should be the priority in case of any pandemic (Boyce, 2007). Frontline health care workers have become the heroes of the moment. “Globally, 21 January 2021, there have been 340,543,962 confirmed cases confirmed cases of COVID-19, including 5,570,163 deaths, reported to WHO” (WHO, 2021).

At the start of 2020 and after the emergence of COVID-19 pandemic, many leaders raised alarms that health care workers may quit or die over the insufficiency of personal protective equipment (Newman & Lattouf, 2020).

Even though the responses of public health policies intended to delay the spread and contain COVID-19 pandemic, numerous nations have been facing this critical crisis. It is important to achieve effective diagnosis and treatment in order to, to minimize the burden imposed by the pandemic on the healthcare systems and reduce the workload on healthcare workers (Wynants et al, 2020).

Doctors had their fears and insights concerning the COVID-19 pandemic which need to be addressed during policy making. The wellbeing and health of the doctors’ families and contracting Covid-19 infection were the major concerns of health care workers. Especially, if they are not provided with proper personal protective equipment and become at higher risk of infection. The prospects, fears and experiences of our front liners must be addressed openly to give insight of the opinions of the healthcare workers and to guide policy making to resolve those fears (Urooj et al, 2020).

Medical personnel taking care of COVID-19 patients cope with psychological stress

physical overtiredness, split from their loved ones and families, and the anguish of losing their patients and colleagues to death. A lot of the health care workers have been infected SARS-CoV-2 and some of them even have died. In Africa, where the intensity of the pandemic is worsening, there are huge gaps in responding to the pandemic than other continents, especially in human capacity and protective equipment availability (Chersich et al, 2020).

A study conducted in Wuhan in February 2020 showed results of more than 4,000 questionnaires were distributed on healthcare workers (HCW). One of the major fears of HCWs is infecting their colleagues and family members, as well as protective measures, and medical violence. And near half of the HCWs had psychological distress, especially those working in Wuhan, contributing to frontline treatments, having been isolated and having family members or colleagues infected, so further actions should be taken (Dai et al, 2020).

In a quantitative meta-analysis study discussing the influence of different epidemics and pandemics as influenza, ebola, MERS, SARS, and COVID-19 influenza A on the mental health of healthcare workers, more than 70% of health care workers, counting physicians and nurses recounted post-traumatic stress disorder up to three years after the end of the pandemic. Up to in 50%. Reported depressive symptoms and 45% reported severe anxiety (Preti et al,2020).

2.2 COVID-19 Protective Occupational Policies for health care workers:

While some countries lacked coordinated policy decision and implementation of measures to restrain COVID-19 transmission and protect their healthcare workers. Policy makers were urged to make policies and learn from other countries' experiences like China and Italy and work on developing strategies to contain the crisis and protect their healthcare workers and

save their lives (Dai et al, 2020).

The evidence-based interventions are lacking and defective for COVID-19 for protection of health care workers and absence of clear intervention strategies, which led to limiting the efficiency and convenience of interventions for protection from the pandemic (Jung and Jun, 2020).

China acted rapidly regarding the protection policies of healthcare workers (HCWs) during the COVID-19 pandemic. They recognized that the lack of proper awareness and defective training, the shortage of personal protective equipment, and the lack of rapid diagnostic tests to diagnose COVID-19. Nevertheless, Italy had nearly 25% of their healthcare workers infected with COVID-19 during the peak of infection and this attributed to the late actions of the Italian government and lack of protection of their front liners that lead to explosion of the numbers of COVID-19 cases (Chirico et al, 2020).

Some countries like Taiwan responded to the COVID-19 pandemic by protecting Healthcare Workers through a traffic control bundling (TCB) model of coronavirus containment and HCW protection will ease concerns both for HCWs and the patients they serve (Schwartz et al, 2020).

2.3 Protection of Healthcare workers

The assurance of sustainable medical resources amid the pandemic is pivotal to the protection of healthcare workers irrelevant how hard this challenge could be, especially during the peak of COVID-19 wave where the healthcare systems are already overwhelmed with the maximum capacity (Leite et al, 2020).

Protection of healthcare workers from COVID-19 can be done by minimizing the risk of infection through reduction of number of working doctors inside the hospital and shifting more to tele as well as reduction of outpatient's clinics (Hoernke et al, 2021).

Also, isolation of healthcare workers showing symptoms to reduce the viral transmission.

HCWs are at higher risk of longer viral shedding due to the prolonged exposure which leads to more severe symptoms as well (Bielicki et al, 2020).

Therefore, it is mandatory to form a crisis management team with task force that incorporate the manager, vice executives, Infection prevention team, doctors of infectious diseases as well as emergency and respiratory consultants, laboratory doctors, nurses, and executive members to make and implement policies to protect healthcare workers while doing their jobs (Liu & He et al, 2021).

The protection of healthcare workers always starts with risk assessment and plan of risk mitigation with policies that include proper procedures within hospitals. This also, demands substantial training and continuous audits especially at the beginning of the pandemic where health care givers are at highest risk of infection as they may be not yet be acquainted with suitable precautions to protect themselves (Atkinson et al, 2020).

2.4 Mental health and Staff Support during COVID-19

Caring for patients with COVID-19 disease causes considerable mental stress, resulting in high levels of anxiety and post-traumatic stress disorders, especially among nurses (Huang et al, 2020)

The stress resulted from the emergence of the pandemic had major impact on the mental and psychological health of HCWs. In China, a huge study found that more than 54% were psychologically affected while, near 30% reported moderate to severe anxiety (Wang et al, 2020).

The long working days without support, the feeling of uncertainty and confusion and the apprehensions of HCWs about their own health and their families' health were the

psychological responses reported by HCWs amid the pandemic (Kinman et al, 2020).

The huge conflict between doing their jobs by taking care of their patients and their urge to protect themselves and their families from transmitting the disease to them. Some of the health care workers were in conflict between doing their jobs and treating COVID-19 patients and between abstaining from their work to protect their families and loved ones (McConnell, 2020).

These enormous moral struggles lead to tremendous burden on the mental health of HCWs with psychological stress that led to long-term affection of their mental health leading them to face fear, anxiety and depression (Kinman et al, 2020).

The healthcare professionals faced several challenges trying to care for their patients and protect themselves wearing the PPE as N95 masks and the face shields. These imposed physical as well as psychological burdens had huge negative impact on HCWS including difficulty in breathing, repeated headaches, skin affection as well as difficulties in communication, sleepiness, and psychological stress (Swaminathan et al, 2020)

The recommendations set greater highlighting on the mental health of health care workers and the needed psychological support, whereas healthcare workers placed greater emphasis on structural conditions at work, responsibilities outside the hospital and the invaluable support of the community. The proposed psychological supportive interventions did not always act in response to the ongoing experiences of health care staff during COVID-19, as some of them described not being able to take part in these interventions because of understaff, overtiredness or conflicting schedules (San Juan et al, 2021).

In a meta-analysis that encompassed a review of fifty-five studies, the incidence of depression and anxiety was 20.5 and 25.8% respectively (Johns et al, 2022). The analysis

encompassed twenty-six research studies that looked at depression involving 31,447 participants and thirty research that studied anxiety including more than 33,000 contributors. The study included medical doctors during the pandemic timeframe, most of the studies were from North America, Europe and Asia. Interestingly, the anxiety and depressive symptoms were highest in North America followed by Europe then Asia. It is worth mentioning that the anxiety was higher in the first three months in the United Kingdom then it gradually declined (Johns et al, 2022).

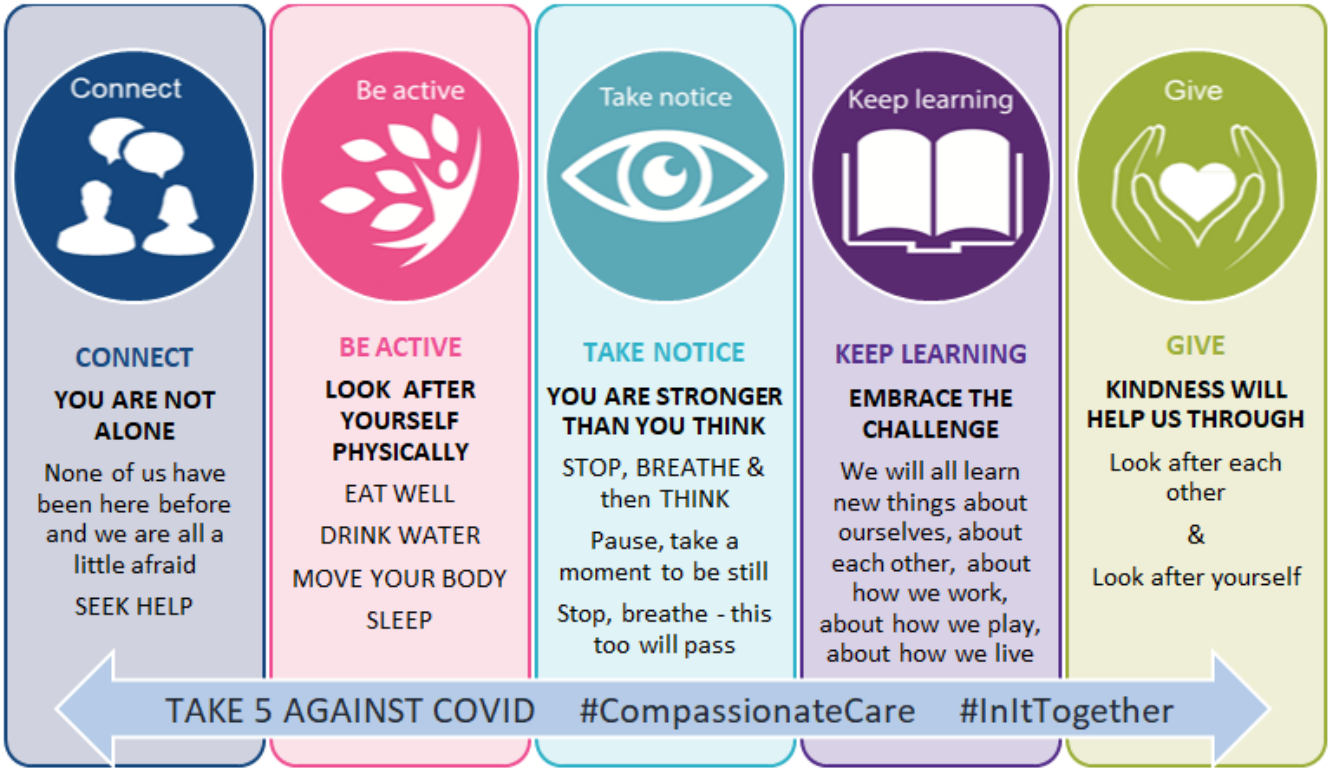


Figure (2): The United Kingdom's health care system mental support banner for health care workers amid COVID-19 pandemic

Source: https://www.publichealth.hscni.net/covid-19-coronavirus/guidance-hsc-staff-

healthcare-workers-and-care-providers/staff-health-and

This shows the importance of supporting the mental health of health care workers during the pandemic as a crucial aspect for protection of health care workers not only from contracting the viral infection but also from mental illness as well.

2.5 COVID-19 Policies in Egypt:

The Egyptian ministry of health attempted to follow the WHO guidelines very early amid the pandemic which led to reduced rates of COVID-19 other in comparison to our neighboring countries and European countries as well. At the beginning of March 2020, as the pandemic started to approach near countries, the ministry started implementing universal use of PPE for COVID-19 and performed targeted SARS-CoV-2 testing of patients who are not showing signs or symptoms of COVID-19 at the start of the pandemic, then, they shifted to testing of symptomatic patients only to save resources needed (Hager et al, 2020).

The Egyptian ministry of health transformed by the end of March 2020, more than 100 hospitals to become isolation hospitals and postponed elective procedures, surgeries, and non-urgent outpatient visits should be postponed in certain circumstances. Additionally, the isolation hospitals optimized the use of engineering controls to advance the ventilation systems and protect the health care workers. Also, there was a process to respond to SARS-CoV-2 exposures among health care workers and manage visitors' access and movement within the facility (Ogunleye et al, 2020).

The importance of the development and implementation of national programs for occupational health for health care workers allied with the international occupational health and safety policies is crucial during the COVID-19 pandemic to enhance sense of security for health care workers and reduce their fears and concerns about their workplace protection. The regulations and laws for

occupational health and safety ensure that all health workers have regulatory protection of their health and safety at work (Ahmed et al, 2020).

Health care workers are the main defense in the battle against COVID-19. Despite the high knowledge score and the positive attitudes observed in several studies among Egyptian health care workers, the rate of infection and the number of deceased Egyptian doctors and allied health workers was relatively high in comparison to the officially reported positive cases by the Egyptian ministry of health. Thereby, providing the health care workers with mental, psychological support is vital in alignment with the other protective measures (Wahed et al, 2020).

2.6. Policy Relevance of implementing right policies to face COVID-19:

Most of the signs indicate that applying policies to reduce COVID-19 spread as social distancing mandates is crucial slow the spread of COVID-19. This policy is consensus about the importance of proper policies in reduction of the new cases. (Daeho et al, 2020).

Public health guidelines implemented to lessen the transmission of COVID-19 can either enhance or undermine the effects of other policies employed simultaneously. Amid the peak of the waves of COVID-19 pandemic, numerous countries have taken serious measures, like lockdowns and work from home to reduce and potentially eradicate the virus (Dennerlein et al, 2020).

The COVID-19 policies to protect health care workers to reduce healthcare workers infection rate were very important to reduce the morbidity and mortality of the frontliners. Most research studies emphasis on the medical aspect which focuses on discovery of better treatment or developing vaccine to COVID-19. Nevertheless, they lack the discussion of the policies that could be applied to protect the front liners and their effectiveness.

Chapter Three: Research Methodology

3.1 Design

The research question is to discuss the policies applied during the COVID-19 pandemic in Egypt and the efficiency of implementing these policies and protecting their healthcare workers. We use qualitative research methods. By using the qualitative method, we aim to reach in depth understanding of the conduct and the causes and motives behind that conduct (Yilmaz, 2013). The policies to protect healthcare workers and their efficiency will be collected using qualitative data methods as 10 in-depth interviews with open ended questions from August 2021 till the end of September 2021 focusing on the understandings and the impact of those policies according to the participants and comprising their reflection pledging validity of the data.

3.2 Methodology

As for the research design, the interviews were designed to be semi-structured using open-ended questions to allow flexible structure and understand the subject in a broad way. Semi-structured interviews allow the informants to speak their mind profoundly, and guiding questions will be asked if the discussion derailed from the purpose of the interview.

The interviews also included in depth questions toallow the participants to express their honest opinion on certain issues in specifics, such as the training and truly implemented policies to protect the physicians amid the crisis. The design of the questions was adapted according to the interviewee to attain more details (Britten,1995). The questions of the interviews aimed at prompting a clear picture of the participant's perspective on their concerns as health care

workers working during the COVID-19 pandemic and the policies to protect them. Also, assessing the efficiency of the applied policies in protecting health care workers regarding their own point of views.

3.3 Sampling

Purposeful sampling tactic was used during the choice of the participants; the selection criteria were contingent on the research objectives. The objectives were predetermined to direct the selection process of the interviewees (Guetterman, 2015).

The selection criteria included: All participants should have at least two years' experience in the medical field and should be currently working at the case study hospital in Egypt. The hospitals must have had their own policies implemented during the COVID-19 first wave pandemic. Diversity in positions was taken into consideration as much as possible to increase the credibility of the data collected. The basis of the selection focused on how to tackle all the issues related to the efficiency of protective policies to healthcare workers from different perspectives. The sample involve male and female healthcare workers. The participants were from different specialties.

The interviewees were from different specialties and ages; they were physicians from chest and intensive care departments, as well as orthopedic surgeons, vascular surgeon, infection prevention practitioners and Lab consultant at the case study. The participants age ranged from 28 to 45. The variability was crucial to ensure validity of the data.

4.1 Background of the Interviewees

The first interview was conducted on September 2021 with an orthopedic surgeon (Annex 5) who operated on several COVID-19 operations at the case study. He has been working at the case study for 13 years. He was able to assess the impact of the policies on protection of the patients as well as the surgeons from the infection. The interview was done via skype. His opinion was that the hospitals policies were very up to date and dynamic all through the wave. The policies were constantly updated to protect the workers, nonetheless, the application of the policies was lagging.

Additionally, he stated that policies seemed protective, but the defects in application were challenging when they had to operate on COVID positive patients as they had to wait till the personal protective equipment were ready and available. To add on, he said that the tests needed for COVID-19 were daily available for all the healthcare workers and their families when they were not available for most people except through the ministry of health.

The second interview was conducted with chest physician who worked at the isolation hospital of the case study as well as other private hospitals during the first wave of COVID-19. He has working experience of four years. He was able to assess the difference between the policies applied both hospitals to protect the health care workers from infection. He praised the protective conditions inside the isolation hospitals at the case study as the personal protective equipment were always available with good quality.

To add on, there was always an infection prevention officer to train them on the donning and the doffing of the PPE and to audit the process is done correctly. This made them feel protected. Despite that, the compensation was much less than that provided by the private hospitals, which

made them prefer working at private hospitals which were giving nearly triple the pay for the isolation hospitals' shifts.

Another interview was conducted with a laboratory consultant who was working inside the COVID-19 lab for the case study covering the isolation hospitals as well as the workers and the patients during the first wave. she has been a consultant for more than five years with collective experience of fifteen years. The interview took place inside her office in the molecular lab. She Seemed a bit traumatized from the amount of work they had to do amid many challenges.

Furthermore, she acclaimed the cooperation and the commitment of the administration, and the infection prevention teams to continuously provide them with the needed kits to run huge number of tests and the large number of PPE and disinfectants respectively. Nevertheless, she criticized the lack of automated machines for carrying the tests which would have been much more protective and needs less effort from the workers.

The fourth interview was with an intensive care resident who worked inside the intensive care unit inside the isolation hospitals. The interview took place through zoom call. He has been working for more than two years as a resident in the intensive care department at the case study. The residency period is one of the hardest periods of the training of the physicians as they take very long shifts and spend most of the three residency years at the hospital.

Also, he stated that the 12 hour shifts inside the ICU of the isolation hospitals was such an emotionally and physically draining experience as he used to spend 12 hours shifts for one week every month wearing the PPE suits. He was kept inside the isolation hospital for this week with COVID-19 testing before entrance and before leaving.

The next interview was with an infection prevention consultant (annex 4) who played a major role in the protection of healthcare workers in the hospital. She was one of the policy makers who was always involved in the dynamic process of the updating of policies to protect the

healthcare workers amid the uncertainty of the first wave, when there was a little known about COVID-19, the proper diagnostic policies, isolation policies and the returning to work policy as well. She felt that she did the best she could with the challenge of the understaffing of infection preventionists at the hospitals especially amid panic of the healthcare workers.

The sixth interview was carried with a vascular surgeon through the phone. He is an assistant lecturer of vascular surgery with 5 years' experience. He operated on several COVID-19 cases inside the isolation hospital as well as emergency COVID-19 cases at the case study Emergency hospitals. He stated that there was a lot of problems and confusion especially when he operated at the Emergency hospital. There was shortage of PPE, and they were not easily available by night as the process to provide them required several permissions and the process was not well known to all the workers.

The seventh interview was a lecturer of orthopedic and spine surgery who has been working for 10 years who is responsible for organizing the schedules of doctors for the ER hospital. He said that at the beginning there were some challenges in the availability of the personal protective equipment, and later everything of the needed PPE were available. The policies were available nonetheless there were some incompliances from some health care workers, yet he was concerned about the unavailability of insurance to his family despite the risk he takes by going daily to work.

The next two interviews were with infection control practitioners, one responsible for the orthopedic department and the other one oversees the Emergency hospital. The meeting was in their meeting room. The interview was very smooth with minimal interruption. They stated that executing and observing the policies implementation was extremely difficult amid the first wave of COVID-19.

The policies were sent via email for the senior physicians or hard copies to the heads of

different departments and were not distributed to all physicians and nurses. Implementing policies needs training initially followed by continuous observation, auditing, and appraisal by monitoring tools such as infection rate and surveillance. They trained most of the doctors and nurses to raise their awareness of COVID-19, yet many health care workers were infected with COVID-19 mostly outside the isolation hospital due to the non-compliance to the COVID-19 policies and prevention measures.

There are diverse methods to safeguard the compliance of health care workers by continuous appraisal with either praising or punishing but unfortunately, the punishment works better. The other challenge is that the infection prevention is a part time job at the case study, so it was really hard for the team to work much more during COVID-19 along the main job they already do at the hospitals and college simultaneously.

The infection control practitioners needed to work very hard with the limited resources they had alongside the studying and continuous learning they had to do to understand COVID-19. In addition, they had to train the health care workers on how to protect themselves as well as continuously update the policies and audit and closely monitor the application of the policies.

Table 1: Data about the interviewed participants

Code	Status	Years of experience
01	Chest Physician	>5
02	Intensive care physician	>2
03	Orthopedic surgeon	>10
04	Orthopedic spine surgeon	10
05	Laboratory consultant	10
06	Vascular surgeon	6
07	Lab consultant	>10

08	Infection prevention consultant	8
09	Infection control practitioner	3
10	Infection control practitioner	4

Source: constructed by the author using information on interviewees.

3.4 Limitations

The dynamic process of COVID-19 occupational policies that makes it hard to assess the real efficiency and impact of them fighting COVID-19 in the case study hospital. Also, the interviewees opinion is subjective and personal bias or misconceptions could affect the objective and outcomes in this research. Also, the small number of interviews was another limitation and the unclear indicators for assessing the efficiency of the policies.

3.5 Ethical consideration

All interviews and observational study were held in the period between May and September 2021, after the IRB approval (Annex 1). The interviews were conducted in Arabic, then translated and written down in English by the researcher. All the participants were informed about the nature of the study with clear explanation of the objectives of this research through a written informed consent (Annex 2). The documents of each interview will remain confidential, and the data obtained by the interviews were analyzed and discussed by the researcher.

Chapter Four: Data analysis, Findings and Discussion

Our qualitative study encompassed ten in-depth interviews that were conducted to allow the participants to discuss their thoughts and experience amid the COVID-19 pandemic era inside the hospitals (Mack et al, 2005).

4.1 Research findings and themes discussion:

The interviews discussed and reflected the policies issued by the case study to protect the health care workers as well as the implementation of those guidelines and their efficiency in achieving protection of health care workers.

- Three main themes emerged from the collected data including: the tremendous physical and emotional impact on healthcare workers from COVID-19 pandemic, the plan for protection of health care workers from COVID-19, the defective application of the COVID-19 policies and the negative impact of COVID on healthcare workers, with mental health considerations.

The Challenges Health Care Workers Faced during the first phase of COVID-19

The awareness of the impact of COVID-19 pandemic worldwide

Most of the interviewees were aware of the extent of the problem and of its consequences and this was obvious in their replies as stated by the vascular surgeon.

"Yes, I know the extent of the COVID-19 pandemic problem and its major consequences where it led to death of large number of people worldwide as well as the disruption of the normality of life of most people and the lockdown" (interview 06,

August 2021).

This quote was received by nearly most of the interviewees which gives a clear vision to the extent of the consciousness of the pandemic as a traumatic experience all of us had to go through from the start of the preceding year witnessing the death toll from COVID-19 every day. Secondly, it was crucial to raise the healthcare workers awareness of the situation; thus, the questions were formulated to assess their awareness of the problem and the challenges of working amid COVID-19 pandemic including working during the lockdown and the curfew times when most people were working from home.

- **The emotional Challenges of COVID-19 on health care workers**

The experience of working as healthcare worker during COVID-19 was distressing, most of the doctors faced anxiety, fear of harming their loved ones, helplessness and depression. The chest physician interviewed notes:

"I suffered from severe anxiety especially waiting for the COVID-19 results before getting out of the isolation hospital after finishing my duty week there, sometimes I stayed outside till late night in my car as I was afraid to go home till, I get the negative result to protect my family" (Interview 01, September, 2021).

He opened about the huge emotional stress he and other health care workers were facing; they were completely locked inside isolation hospitals with COVID-19 patients for one straight week and they had to be tested before entering and before leaving the isolation hospital. Some of them were extremely tense and worried till they receive the COVID-19 test results before contacting other people and that was such an emotionally and physically draining experience.

The plan and policies for protection of health care workers from COVID-19

1. The announced protective measures and availability of personal protective equipment

Regarding the regular announcement of the updated protective occupational policies and their distribution on health care workers as well as the availability of proper personal protective equipment when needed, we discussed that topic with our contributors.

The spine surgeon interviewed notes:

> **"The policies were several COVID-19 related policies sent to us via the official email to regulate the work inside the hospitals and reduce the spreading the infection" (Interview 04, September 2021).**

This was stated by the spine surgeon that the plan and policies for protection of health care workers from COVID-19 were available with continuous updating according to the emerging information about the infection and how to fight it, minimize its transmission among the workers and the patients at the case study which was very clear from the responses of our interviewees.

Many of the interviewees had the same opinion. They specified how the policies included the proper PPE for each situation as well as the isolation policies for 14 days then reduced to 10 days according to the updated guidelines, admission policies and return to work policies using negative COVID-19 tests. Secondly, the policies were continuously updated according to the availability of international data by the WHO.

Digging deep in the interviews to elucidate the policies to protect the healthcare workers and to what extent were they applied and if they were successful in reducing the infection rates. The research discovered the COVID-19 policies were continuously issued and updated, nonetheless, it was not properly applied and implemented equally in all departments. Some

departments as the isolation and the emergency department had more access to the timely personal protective equipment.

Deeper in the discussions, we discovered that there were several policies announced aiming to protect the healthcare workers including isolation policies for COVID-19 patients and their contacts. The policies encompassed the proper instructions for wearing the proper Personal protective equipment for each situation and encounter in different departments. Also, policies for return to work after isolation for being contact to a COVID-19 case or infected.

The presence of protective policies to guide the health care workers on how to protect themselves from infection and deal with the infection when they got infected was the chief finding of our research and reflected the administration's attempts support to their employees. The chest physician interviewed notes:

> **"The tests needed for COVID-19 were daily available for all the healthcare workers and for our families when they were not available for most people except through the ministry of health" (Interview 01, September 2021).**

Another positive aspect stated by the chest physician was the availability of diagnostic test for COVID-19 for the health care workers during the pandemic despite the limitations imposed by the government at that time on the testing process. During that time, the COVID-19 tests were available only in the central lab of the ministry of health, so it was a very useful step to allow testing health care workers and their families at the case study.

The ICU physician notes:

> **"Inside the isolation hospital, the proper personal protective equipment were available with very high quality and in the needed quantities. Also, there were infection prevention officers who monitored the way we put on the personal protective**

equipment and when we remove them" (Interview 02, September 2021).

The ICU physician praised the protective conditions inside the isolation hospitals at the case study as the personal protective equipment were always available with good quality. Also, there was continuous auditing via an infection prevention officer to their donning and doffing of personal protective equipment before and after entry and the exit from the isolation intensive care ward, which made them feel protected.

The Lab consultant interview notes:

"The COVID-19 lab has been working everyday since we started in April 2020, not even taking the feast vacation off to be able to timely diagnose the health care workers and their families as well as the patients, so they can be isolated or admitted to isolation hospital as soon as possible. We knew it has been very stressful time, but we had to be up to the challenge despite the repeated infections of our workers and the shortage of staff members. Also, the administration, and the infection prevention teams were committed to continuously providing us with the needed kits to run huge number of tests and the large number of Personal protective equipment and disinfectants respectively" (Interview 07, September 2021).

As stated by the laboratory consultant in the COVID-19 lab. She stated a lot of challenges they faced during this period; like the huge amount of work and tests they had to do as well as the repeated infections to several members of the team which made the workload very high.

Furthermore, the acclaimed commitment of the administration, and the infection prevention teams to continuously provide them with what they need reflects the importance of managerial support to the employees and it's cruciality in protecting health care workers.

The Policy Failure to Protect health care workers

As we moved further, we received opposite responses from two different physicians about the way they thought the hospitals dealt with the COVID-19 pandemic which illustrates that the discrepancies in application of COVID-19 protection policies on healthcare workers based on the hotness of the department and the possibility of managing COVID-19 patients; the isolation hospitals never suffered of shortage unlike other surgical and medical departments where there were several repeated shortage events of PPE which made the health care workers feel unprotected and frustrated.

The orthopedic surgeon interview notes:

> **"The policies were constantly updated to protect the workers, nonetheless, the application of the policies was lagging" (Interview 03, September 2021).**

As stated by the orthopedic surgeon complaining about the lagging of application of policies and delayed distribution of personal protective equipment in the operating room, which forced them to get their own personal protective equipment many times. This was attributed to the urgency of the department need to the personal protective equipment, because the isolation hospital needs larger amounts of good quality protective equipment. To add on, there were no distributed policies about the proper treatment for home isolation for COVID-19, or when to go to the hospital for admission.

The infection prevention practitioner interview notes:

> **"It was crazy times, my phone was ringing all day, people were panicking I had to reassure them, guide them through the process of testing, isolation procedures, educate them about the virus and methods of protection as well as make sure they can get the proper care when they need it whether access to diagnostic tests or proper**

treatment and drugs or admission when they need it" (Interview 09, September 2021).

The infection prevention specialist discussed how hard that they were responsible for hotline numbers for answering any inquiries related to COVID-19 and home management, but this was very hectic for the infection preventionists team as they were answering these calls for 24 hours in rotation due to the shortage of the team in charge.

2. The defective availability of proper personal protective equipment

As the pandemic worsens, the availability of adequate personal protective equipment for health care workers is a key concern. Some health care workers are waiting for equipment to be provided while they see patients who might be infected. The proper provision of personal protective equipment is the first step in addressing the various practical measures that are needed to support and protect health-care workers.

The orthopedic surgeon stated that

"The absence of proper personal protective equipment when we needed it was very stressful apart from the stress we already had from the pandemic. Most of us bought masks and alcohol to cover the defect of personal protective equipment availability especially at the mid and night shifts" (Interview 03, September 2021).

He operated on several COVID-19 cases inside the isolation hospital as well as emergency COVID-19 cases at the emergency hospitals. He stated that there was a lot of problems and confusion especially when he operated at the Emergency hospital. There was shortage of personal protective equipment, and they were not easily available by night as the process to provide them required several permissions and the process was not well known to all the workers.

One of the defects in protection of health care workers and application of the COVID-19

protective policies that there was discrepancy between the application of the policies according to the department which led to several implications. Many of the physicians stated that apart from the isolation hospital and the emergency hospital, there were defects in the availability of proper personal protective equipment which made most of the doctors rely on their themselves and donations to provide the needed personal protective equipment during work.

Furthermore, there were no shared policies about the appropriate treatment for home isolation for COVID-19, or when to go to the hospital and what are the alarming signs that you need to go to the hospital for admission.

3. The inadequate infrastructure for isolation of patients

Another outcome was perceived about the limited resources of facilities they work in as well as the grave defects in the infrastructure in the hospitals.

The ICU physician interview notes:

> **"There were no space for isolation of suspected COVID-19 patients in most of the departments of the case study hospitals we had to search for some free spaces to use as isolation rooms for suspected patients till, we get the confirmed results and transfer them to isolation hospitals" (Interview 02, September 2021)**.

Absence or limited of resources was a clear finding detected. This was mirrored through the reply of the ICU physician stating the unavailability of isolation rooms in several departments. This outcome was not very surprising as most of the Egyptian public hospitals have many infrastructure flaws as the governmental subsidy to support the healthcare sector is not always a precedence in Egypt as most of the developing countries.

Additionally, the unprepared infrastructure of the hospitals to have proper isolation wards

made it very difficult and very late to prepare isolation hospital and isolation wards, which led to loss of the life of several healthcare workers due to late hospital admission when needed.

4. Training of health care workers on COVID-19 protective measures

Training healthcare workers on how to protect themselves from the SARS-COV 2 infection was one of the crucial methods to fight the pandemic and to protect the healthcare workers. In our interview with the infection preventionist assigned with training healthcare workers.

The infection prevention specialist interview notes:

> **"Regarding raising the awareness of COVID-19 amid the chaos of the information and social media craziness about the misinformation related to COVID-19 and the continuously emerging rumors about the infection and its consequences, was a great priority for the hospital especially for the younger doctors who were the true frontliners. We were very keen to give them the proper training on the protection from infection as well as the proper donning and doffing of personal protective equipment before and after exposure to COVID-19 positive patients. This was one of our first priorities in fighting the pandemic as we found that in Italy there were high rates of doctors' infection and mortality attributed to lack of proper training" (Interview 10, September 2021).**

She declared the importance of training especially of the junior doctors in protection of the employees. Yet, the training was defective for the elder physicians as they spend less time inside the hospital, and they are much less exposed to COVID-19 patients at the public hospitals. Despite that, they were at higher risk for more severe infection with higher probability for

hospital admission and mortality and some of the elder healthcare workers were deceased due to COVID-19 infection. There were several zoom trainings but still they did not cover most of the elder healthcare workers.

This gave us an outline about the huge importance of education and training of healthcare workers and they emphasized on the importance of considering the massive impact of defective education and training as a cause leading to poor consequences leading to increased rate of infection and mortality of healthcare workers.

Yet, there was major defect in the elder staff members training on the proper donning and doffing of PPE as well as protection from the infection outside and inside the hospitals, which was one of the causes that led to rise in infection rates in the elderly.

5. Financial support and insurance coverage to health care workers and their families during COVID-19

One of the crucial matters we discussed with our interviewees is the support given for the healthcare workers whether financial, psychological, or proper insurance for the pandemic. Unfortunately, the three were lacking at the case study as stated by the contributors.

The ICU physician interview notes:

"It was extremely stressful that we knew that our insurance inside the isolation hospitals was not covering our families, we were working inside the isolation hospitals at risk of catching the virus and then going back to our families risking transferring the infection to them. Yet, they were not covered by our insurance. One of our colleagues transmitted the infection to both of his parents, they were both admitted to the isolation hospital and one of them died, nevertheless, he had to pay more than five

hundred thousand pounds which was not affordable to most people, and we had to collect money from our colleagues to cover the expenses." (Interview 02, September 2021).

This was a dreadful story stated by the ICU physician that revealed the unfair conditions for healthcare workers in Egypt. He reflected on the lack of decent insurance to healthcare workers families and unavailability of hospital beds when needed for health care workers or their families was a major defect that added to the stressors of the health care workers. Additionally, the compensation was much less than that provided by the private hospitals, which made them prefer working at private hospitals which were giving nearly triple the pay for the isolation hospitals' shifts.

6. Psychological and mental health support given to health care workers during COVID-19

Also, none of the healthcare workers received psychological support from the administration nor there were assigned psychiatrists for the support of workers at isolation hospitals. Moreover, the monetary compensation for the isolation shifts was much less than other private hospitals.

Mental health negative impact of COVID-19 on health care workers were tremendous in several aspects starting from the isolation inside isolation hospitals with fear of catching the infection, transmitting the infection to loved ones and harming or losing them. Furthermore, they faced anxiety from waiting to the continuous COVID-19 test results and if the tests came positive, they continued suffering from isolation, self-quarantining, as well as the fear from harming their loved ones.

The ICU physician interview notes:

"**I had to be the last face seen by several people before intubation, trying to assure them behind a suit when I know they were dying telling them to say *shahada* before I put them to sleep and most of them didn't make it out alive. I felt devastated!" (Interview 02, September 2021).**

This depressive quote was said by the ICU physician about the depressive work they face as they intubate their patients to put them on ventilators and many of them die. Not to mention the enormous work load they had to do treating the COVID-19 patients wearing the protective suits during their COVID-19 shifts inside the isolation hospital not able to breath properly, which left most of them burnt out and depressed at the end of the first wave.

7. The efficiency of the implementation of protective policies in protection of health care workers

In testing the response of healthcare workers on the effectiveness of policies and procedures implemented to protect the healthcare workers, the response was very controversial. As many doctors complained that despite the availability of policies, they were not properly applied.

The ICU physician interview notes:

"It took so long to prepare the isolation hospital for infected health care workers of the Case study, our infected colleagues used to call the elder professors and the managers to speed the process of their isolation" (Interview 02, September 2021).

The ICU physician reflected on the lagging preparation of isolation hospital for health care workers, which led to poorer prognosis and worse experience of the health care workers during COVID-19

Also, implementing policies that needs training initially followed by continuous observation, auditing, and appraisal by monitoring tools such as infection rate and surveillance. They trained most of the doctors and nurses to raise their awareness of COVID-19, yet many health care workers were infected with COVID-19 mostly outside the isolation hospital due to the non-compliance to the COVID-19 policies and prevention measures.

8. The communication between the administration and health care workers

Absence of the leadership commitment to protect the employees is another factor that leads to letting down of the health care workers and made them lose trust in the foundation they work at. Most of the interviewees reported defective communication from the administration and managers with them especially when needed. Most of them had to reach more senior doctors to communicate with the administration, as the junior doctors did not have access.

The infection prevention consultant interview notes:

> **"We had the COVID-19 testing available daily 24/7 we didn't even take vacation during the feast or any other day we were continuously working to protect our workers despite of the challenges we were facing. At first, the isolation hospitals were limited to ministry of health hospitals and we were not allowed to use one of our hospitals as isolation due to governmental restrictions. Then, we provided a free isolation hospital for our workers with a very high cure rate amid the continuous challenges to provide proper care for the infected people" (Interview 08, September 2021).**

Nonetheless, the infection prevention consultant disagreed with this opinion as she stated that the communication was from the infection control team with the health care workers on behalf of the administration to help the employees access the diagnostic tests and get admitted when needed. Yet, this was hindered by the shortage of the number of the working infection

control team.

Table 2. SWOT analysis

STRENGHTS	WEAKNESS
• Availability of personal protective equipment in isolation hospitals • Training of personnel • Raising awareness about the protection from COVID-19 • Continuous updating of COVID-19 protective policies	• Defective infrastructure of hospitals • Incomplete training of elder staff members • Reliance on individuals to provide the defective equipment rather than institution • Defects in the implementation and monitoring of the written policies • Weak communication with physicians • Negligence about mental wellbeing of healthcare workers amid the crisis • Lack of insurance to healthcare workers families

OPPORTUNITIES	THREATS
• The presence of isolation hospital for health care workers that could be improved • The presence of working infection prevention team	• Increase in the number of patients of COVID-19 patients • The rising mortality rate of COVID-19

Source: constructed by the author using data from 10 semi-structured interviews with health care workers in Egypt according to the SWOT analysis proposed model (Leigh, 2009).

Chapter Five: Conclusion and Recommendations

5.1 Conclusion:

After the emergence of COVID-19 pandemic and the monumental impact it had on the health care systems and health care workers, it was crucial to protect the health care workers using the proper occupational polices. Using qualitative in-depth semi structured interviews with ten health care workers working at a huge university hospital, we dug deep in the protective working policies and their implementation at the case study hospitals.

There were several protective policies to pledge the safety of health care workers. Nonetheless, the implementation was lagging and defective in different aspects including the infrastructure of hospitals, personal protective equipment availability as well as absent mental health support and defective insurance.

What we conclude from the research that there are several obstacles that hinder proper implementation of the policies of protection of health care workers amid the COVID-19 pandemic in Egypt. This led to raised morbidity and mortality of health care workers amid the crisis of the COVID-19 pandemic.

Unprotected contact with patients infected with COVID-19 may confer great risk, especially that social distancing, is not easily attainable in a hospital. Apart from offering proper training on the use of appropriate personal protective equipment with righteous donning and doffing with easy access, the implementation of the infection prevention measures to avert the robust spread of COVID-19 between healthcare

workers is crucial for their safety and protection.

The improper implementation of policies contributed to the rise of number of health care workers infection and mortality rates in Egypt, including the lack of accessible personal protective equipment, unprepared infrastructure to become isolation wards, defective training as well as incomplete insurance and the absence of mental health support.

However, many of these defects can be fixed and improved in the upcoming COVID-19 waves with more strong leadership commitment which is compulsory to maintain the rules and implement it efficiently to contain the spread of infection and protect the health care workers.

Lastly, lack of communication between the administration and different departments led to several drawbacks for health care workers during the pandemic, starting with several defects in the personal protective equipment availability in several departments and the defective insurance which was uncovering to the families of health care workers which increased the insecurities of the health care workers towards their institute. Thus, the gap increased between them and the administration is also a main challenge that needs to be addressed and fixed.

5.2 Policy Recommendations:

Based on the findings of this Thesis, we develop a set of policy recommendations that could help achieve better protection to health care workers.

The improvement of the infrastructure of hospitals to be suitable for admission of COVID-19 patients without risking the transmission of

infection to health care workers. Highlighting the importance of improving the hospitals' infrastructure, a study in Nigeria discussed the unprepared hospitals for COVID-19. Yet, they came up with the same recommendations including; prioritizing the reinforcement of hospitals to be prepared for receiving the patients, to surge their COVID-19 capacity, and increase the welfare and protection of the staff members (Ogoina et al, 2021).

Communication of administration with healthcare workers is crucial to identify their needs and detect the pitfalls in the system and fix it, especially that public hospitals are huge with several departments which make it harder to early identify any emerging problem. There should be continuous planning, execution, and auditing, then receiving feedback to assure ongoing improvement (Walton et al, 2020) (Houghton et al, 2020).

The mental health of health care workers is an uprising priority amid COVID-19 pandemic due to the ongoing stress the health care workers exposed to as well as the burnt-out feelings they face especially after the overwhelming work they had to do and still need to continue working for the upcoming pandemic rising waves (Martin et al, 2020).

Organized training on infection prevention policies at the start of their residency program which allows them to be educated about the infection prevention procedures. Furthermore, continuous training should be given to all health care workers including senior and junior staff members through online platforms to assure continuous education especially during the

pandemic after the proven efficiency of training in reduction of infection rates (Haji et al, 2020).

The evidence suggested by a case study recommends that the proper timed use of personal protective equipment is successful in reduction of transmission of COVID-19 infection between health care workers and reflects the importance of masks in preventing infection (Park, 2020).

The suitable financial support, compensation for health care workers and health insurance have been long standing major problems in the health care sector and especially during COVID-19 pandemic, with the continuous hazards and risks they are facing (Yearby & Mohapatra, 2020).

This has been a longstanding problem in Egypt, that need to be reevaluated and improved especially after the relentless work of health care workers at the isolation hospitals and the high number martyrs of the health care workers including doctors, nurses, and hospital workers.

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Annexes

Annex 1

Informed Consent for Participation in Research Study

Project Title: Egyptian policies to protect healthcare workers amid COVID-19 crisis

Principal Investigator: Moushira Hosny Ezzelarab

Email: Moushira@aucegypt.edu.eg

Mobile number: 01066534537

*You are asked to participate in a research. The purpose of the research is [to emphasize on the effectiveness of policies to protect healthcare workers in Egyptian hospitals amid the COVID-19 Crisis, and the findings may be published.

The expected duration of your participation is through the interview.

The procedures of the research will be through semi structure interviews will conducted with doctors working in the case study.

*There will not be risks associated with this research.

*This research will help in better understanding of the policies to protect the healthcare workers amid the COVID-19 pandemic, this explanatory research is designed to examine the impact of implementing different policies in Egypt to reduce the risk of infection of the front liners and to discuss the efficiency of the COVID-19 policies and strategies in protecting the healthcare workers.

*The information you provide for purposes of this research is confidential. Your identity will not be revealed except to the researcher or research assistant and will not be mentioned in the research writing or publication.

"Questions about the research should be directed to Moushira Hosny Ezzelarab

*Participation in this study is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty.

*Your response would be greatly appreciated. Thank you.

Name

Signature

Date

Annex 2

Institutional review board approval

CASE #2020-2021-124

This is to inform you that I reviewed your revised research proposal entitled " Egyptian policies to protect healthcare providers amid COVID-19 crisis" and determined that it required consultation with the IRB under the "expedited" category. As you are aware, the members of the IRB suggested certain revisions to the original proposal, but your new version addresses these concerns successfully. The revised proposal used appropriate procedures to minimize risks to human subjects and that adequate provision was made for confidentiality and data anonymity of participants in any published record. I believe you will also make adequate provision for obtaining informed consent of the participants. This approval letter was issued under the assumption that you have not started data collection for your research project. Any data collected before receiving this letter could not be used since this is a violation of the IRB policy. Please note that IRB approval does not automatically ensure approval by CAPMAS, an Egyptian government agency responsible for approving some types of off-campus research. CAPMAS issues are handled at AUC by the office of the University Counsellor, Dr. Ashraf Hatem. The IRB is not in a position to offer any opinion on CAPMAS issues, and takes no responsibility for obtaining CAPMAS approval.

This approval is valid for only one year. In case you have not finished data collection within a year, you need to apply for an extension.

Thank you and good luck

. Dr. Atta Gebril IRB chair,

The American University in Cairo

Annex 3

Questions of the semi-formed interviews:

- How long have you been working at the case study hospitals?
- What is your role in the department?
- How was your working experience during COVID-19 pandemic?
- How did you feel working as a healthcare worker during the COVID-19 pandemic?
- What were the announced policies and the occupational safety measures to protect health care workers during that time?
- What were the available Personal protective equipment? were they sufficient and of good quality?
- Did you receive any training or awareness regarding the protective measures to COVID-19?
- Did you have any kind of insurance related to your work during COVID-19?
- To what extent did the insurance cover COVID-19 infection to you and your family?
- Did you receive any mental health support during the COVID-19 pandemic?
- What were the available measures to support the mental health of the health care workers?
- How was the communication between the administration and health care workers?
- To what extent do you think the applied policies were effective? Why?

Annex 4

Questions of the semi-formed interviews to the infection prevention policy makers

- How long have you been working at the case study hospitals?
- What is your role in the infection prevention department?
- How was your working experience during COVID-19 pandemic?
- How did you feel working as a healthcare worker during the COVID-19 pandemic?
- What were policies you issued during COVID-19 from the infection prevention department?
- What were the available Personal protective equipment? were they sufficient and of good quality?
- What was the training or awareness given to health care workers regarding the protective measures to COVID-19?
- To what extent did it cover the workers inside the hospital?
- What were the policies issues related to psychological support of the health care workers?
- Did you have any kind of insurance related to your work during COVID-19?
- To what extent did the insurance cover COVID-19 infection to you and your family?
- How was the communication between the administration and health care workers?
- To what extent do you think the applied policies were effective? Why?

Annex 5

Questions of the semi-formed interviews to the surgeons

- How long have you been working at the case study hospitals?
- What is your role in the department?
- How was your working experience during COVID-19 pandemic?
- How did you feel working as a healthcare worker during the COVID-19 pandemic?
- Did you operate on COVID-19 cases inside the hospitals amid the first wave?
- What was this experience like? Were the suitable Personal protective equipment available and accessible at the needed time?
- What were the announced policies and the occupational safety measures to protect health care workers during that time?
- What were the available Personal protective equipment? were they sufficient and of good quality?
- Did you receive any training or awareness regarding the protective measures to COVID-19?
- Did you have any kind of insurance related to your work during COVID-19?
- To what extent did the insurance cover COVID-19 infection to you and your family?
- Did you receive any mental health support during the COVID-19 pandemic?
- What were the available measures to support the mental health of the health care workers?
- How was the communication between the administration and health care workers?
- To what extent do you think the applied policies were effective? Why?