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Occupational Health Challenges encountered by Health Care Workers during the COVID-19 pandemic in Egypt.

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ABSTRACT

Background: During the COVID-19 pandemic in Egypt, healthcare workers faced numerous occupational health challenges. These challenges included shortages of personal protective equipment (PPE), increased workload, inadequate training on COVID-19 protocols, exposure to infection risks, and concerns about their own well-being and that of their families. These factors collectively contributed to the occupational health challenges experienced by healthcare workers in Egypt during the pandemic.

The Aim of The Work: The study aim is to evaluate the Occupational Health Challenges encountered by Health Care Workers during the COVID-19 pandemic in Egypt.

Patients and Methods: This descriptive cross-sectional study involved reaching out to a total of 830 Healthcare Workers (HCWs) through email and social media channels, with 591 of them willingly participating in the survey, resulting in a response rate of 71.2%. Data collection spanned from March to October 30th, 2021. The survey covered various critical areas, including the assessment of COVID-19 transmission among HCWs, the effectiveness of strategies in place for preparedness and response to infectious diseases, the methods employed for surveillance, the presence of Occupational physicians and nurses, training programs focused on infection prevention and control, the availability of Personal Protective Equipment (PPE) for COVID-19, and the implementation of Workplace Controls.

Results: This study addresses the challenges faced by healthcare workers in Egyptian hospitals and emphasizes the need for regular evaluations of hospital preparedness for pandemics. It reveals a notably high prevalence rate

of COVID-19 among healthcare workers in Egyptian Frontline Hospitals, underscoring the increased risk faced by those directly caring for COVID-19 patients. The study identifies variations in preparedness levels across hospital types, with Frontline Hospitals exhibiting superior readiness in key aspects related to COVID-19. Furthermore, it highlights the lack of Occupational Physicians (Ops) in many hospitals, despite their crucial role in pandemic response. Overall, the study provides insights into occupational health challenges and pandemic preparedness within Egyptian healthcare facilities.

Conclusion: This study highlights the high prevalence of COVID-19 among healthcare workers in Egypt, particularly in Frontline Hospitals. It also points out discrepancies in readiness levels across different hospital types and emphasizes the shortage of N-95 masks despite the availability of personal protective equipment. Additionally, advocates for the wider integration of occupational health professionals like Occupational Physicians or nurses in healthcare settings.
Keywords: Occupational Health Challenges; Healthcare Workers; COVID-19 Pandemic; Pandemic Preparedness

INTRODUCTION

In March 2020, the World Health Organization (WHO) officially declared COVID-19, the coronavirus infection that originated in Wuhan, China, in December 2019, as a worldwide pandemic. The infection is caused by ribonucleic acid (RNA) β-coronavirus called severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). COVID-19 was categorized as a disease associated with significant morbidity and mortality rates [1]. As of January 2024, a WHO report indicated a global total of 701,176,420 confirmed COVID-19 cases and 6,965,146 deaths, with the disease being reported in 235 countries [2].

Healthcare workers (HCWs) hold a crucial position on the Frontlines, delivering care to patients infected with this highly contagious disease. Their occupational health is at significant risk due to their close contact with highly infectious patients, but also due to exposure to undiagnosed or subclinical infectious cases. In April 2020, the World Health Organization (WHO) documented 22,073 cases of COVID-19 among healthcare workers in 52 countries [3].

The pandemic has revealed numerous occupational hazards that healthcare workers (HCWs) face, including extended working hours, psychological distress, exposure to X-rays, noise, suboptimal ergonomic conditions, stigmatization, inadequate training to infection prevention and control (IPC) measures such as hand hygiene practices, as well as instances of physical and psychological violence and harassment. Therefore, prioritizing the occupational health and safety of healthcare workers remains a paramount concern during responding to the COVID-19 pandemic [4,5].

Moreover, it remains uncertain whether the clinical features and results experienced by healthcare workers (HCWs) differ from those of the general population. This uncertainty arises from the potential for HCWs to have increased SARS-CoV-2 viral loads due to repeated exposure to the virus, which could, in turn, lead to more unfavorable clinical outcomes [6,7] .

The World Health Organization (WHO) has issued guidelines for preventing infections in healthcare settings. These guidelines emphasize that all healthcare workers in close contact with

COVID-19 patients should follow contact and droplet precautions. Furthermore, it is recommended to implement airborne precautions during procedures and supportive treatments involving respiratory droplets [8].

The risk of COVID-19 infection and fatalities among healthcare professionals, such as doctors, pharmacists, nurses, and other medical and paramedical staff, can be mitigated by promoting awareness raising, maintaining a positive attitude, ensuring the availability of efficient personal protective equipment (PPE), and encouraging standardized health practices concerning COVID-19 [9].

It is crucial that governments around the world take responsibility for providing comprehensive and ongoing training to healthcare professionals, preparing them to effectively respond to future public health crises. Hence, studying the challenges facing occupational health in the medical sector workers during the COVID-19 pandemic is essential for safeguarding healthcare workers, improving pandemic response, and maintaining a resilient healthcare system.

AIM OF THE WORK

The study aimed to Occupational Health Challenges encountered by Health Care Workers during the COVID-19 pandemic in Egypt.

PATIENT AND METHODS

Design and Sitting: This study was designed as a descriptive cross-sectional study utilizing an online questionnaire that was modified and developed from the Occupational Safety and Health Administration (OSHA) guidelines pertaining to the preparation of workplaces for COVID-19 [10]. The research focused on Health Care Workers (HCWs) who provided care for patients during the COVID-19 pandemic period, spanning from March 1st to October 30th, 2021. These HCWs were drawn from various types of hospitals in Egypt, including University Hospitals, General Hospitals, Frontline Hospitals, and Private Hospitals.

Sample and Sampling: A total of 830 HCWs were contacted through email and social media channels, out of which 591 willingly participated in the survey, resulting in a response rate of 71.2%. The data collection was carried out exclusively in an online format. Inclusion criteria encompassed individuals aged 18 or older, actively working as HCWs, proficient in using electronic software for data submission, and having a minimum of three months of experience in a hospital setting during the COVID-19 pandemic to ensure familiarity with rules, regulation, policies and procedures of working during COVID-19 pandemic. The sample size was calculated based on the Eastern Mediterranean Region health Workforce Snapshot in Egypt for the years 2011-2020, considering the ratio of healthcare workers to the population. Sample size initially determined using the Rao soft sample size calculator based on 95% Confidence Level, 6.93% margin of error, the anticipated response of 50%, total target Egyptian population size of 82160 physicians (11 physicians/10,000 population),197600 nurses (19 Nurse/10,000 population) Dentists (2.5

Dentists/10,000 population) pharmacists (6 Pharmacists/10,000) [11] . The calculated sample size was initially set at 385 subjects. However, considering the dynamic nature of healthcare worker staffing and the need for more comprehensive and expressive results, we made the decision to increase the sample size to 591 subjects, with an anticipated response rate of 71.2%. This adjustment was made to ensure that our study encompasses a wider representation of healthcare workers from various hospitals across the country.

Pilot Testing: A pilot study was conducted involving 25 HCWs to pretest the questionnaire and identify potential issues that could arise during actual data collection. The pilot study aimed to ensure the clarity and comprehensibility of the questionnaire for the participating HCWs. The survey was initially translated from its source language into Arabic by a bilingual translator who was well-versed in healthcare terminology to facilitate understanding among HCWs.

Data Collection: Data collection took place between March and October 30th, 2021, with the researcher employing various channels such as social media, personal emails, and networking to disseminate information about the study and the questionnaire. Privacy, confidentiality, and anonymity were emphasized during the announcement. Interested participants were provided with a link to access the online survey, and the researcher was available to address any inquiries related to the study.

Questionnaire and Ethical Considerations: The study incorporated a socio-demographic survey, encompassing variables such as age, gender, occupation, and marital status. An online questionnaire, adapted from OSHA (Occupational Safety and Health Administration) guidelines, was utilized to gather data pertaining to the transmission of COVID-19 among Healthcare Workers (HCWs) across various types of healthcare facilities. Furthermore, the survey evaluated the efficacy of preparedness and response strategies for infectious diseases, surveillance methodologies, training programs focusing on infection prevention and control, the availability of Personal Protective Equipment (PPE) for COVID-19, and the implementation of Workplace Controls (comprising administrative control, Safe Work Practices, and PPE). The study ensured the confidentiality, privacy, and safety of human participants. Voluntary participation was guaranteed, and electronic informed consent was obtained from each participant. Data was securely stored on a password-protected computer.

Statistical Analysis:

Statistical analysis was conducted using IBM-SPSS version 25. To assess the normal distribution of the data within the groups, the Kolmogorov–Smirnov test was employed. Descriptive statistics, which included frequency, percentages, measures of central tendency (Mean), and dispersion (SD), were utilized to depict the variables. Inferential statistics, such as the chi-square test, were employed to evaluate sample representativeness and investigate significant differences in study variables among participants. A statistical significance level of $P \leq 0.05$ was adopted to identify the factors influencing occupational health challenges encountered by healthcare workers (HCWs) in various types of hospitals in Egypt.

RESULTS

In the present study, **Table 1** showed the participation of a total of 591 healthcare workers (HCWs). These HCWs were categorized into different professional groups, with 420 being physicians, constituting the majority at 71.06%. Additionally, 24 participants were pharmacists, making up 4.06% of the total, while 112 were nurses, accounting for 18.95%. The remaining participants held various roles as healthcare technicians, representing 5.93%. These healthcare workers were recruited from various types of hospitals, each with its own distribution of HCWs. University hospitals had the largest representation, with 288 HCWs, comprising 48.73% of the total. General hospitals closely followed with 219 HCWs, representing 37.06%. Frontline hospitals contributed 30 HCWs, accounting for 5.08%, and Private hospitals had 54 HCWs, making up 9.13% of the study participants. It's worth noting that the study revealed significant differences in the ages of healthcare workers across the various participating hospitals, while other demographic factors among HCWs remained unsignificant.

In **Table 2**, it is evident that a substantial majority of healthcare workers in all types of hospitals have undergone COVID-19 swab testing. Notably, Frontline Hospitals stand out with the highest percentage, reaching an impressive 90%. Furthermore, the data indicates that healthcare workers in Frontline Hospitals face the highest exposure to positive cases and subsequent isolation, with a notable rate of 70%. This heightened risk reflects the challenging environment these hospitals operate in, where direct contact with COVID-19 patients is more frequent. The statistical analysis (P Value of 0.000) suggests significant differences in exposure and isolation rates across the different hospital types. Overall

The data provided in **Table 3** insights into the varying levels of preparedness and response to infectious diseases among different hospital types, with Frontline Hospitals showing higher readiness in specific areas like risk assessment matrix 35%, policies and guidelines related to COVID-19 93%. The P Value of 0.000 suggests significant variations among hospital types regarding the presence of infection control programs.

In **Table 4**, it's notable that across all hospital types, a substantial portion (73.8%-91.7%) of healthcare workers confirmed the presence of a written and published infection control program in their respective hospitals. Frontline Hospitals and Private Hospitals stand out with Frontline Hospitals having the highest percentage at 91.7%, closely followed by Private Hospitals at 89.4% with highly statistical significance. Regarding preparedness for outbreaks, Frontline Hospitals and University Hospitals express a higher perception of readiness, with Frontline Hospitals leading at 76.4%, followed by University Hospitals at 51.2%. In contrast, Private Hospitals and General Hospitals report slightly lower readiness percentages, at 49.1% and 48.4%, respectively. Training in infection prevention and control shows significant disparities among hospital types. Frontline Hospitals exhibit the highest percentage of healthcare workers who have received training in this

area, with a substantial 60.0%. On the other hand, Private Hospitals lag significantly behind, with only 11.1% of healthcare workers having received such training.

Figure 1 highlighted a clear overview of the availability of personal protective equipment (PPE) among the hospitals that participated in the present study. The data clearly illustrates that a substantial majority of these healthcare facilities have readily available PPE resources. Importantly, the difference in availability is statistically significant, as indicated by a p-value of 0.04. Notably, among all types of hospitals, Frontline Hospitals stand out with the highest availability of N-95 Masks, with an impressive percentage of 46.7%.

In **Table 5**, it is showed that Frontline Hospitals stand out with a notably high percentage (95.7%) in their implementation of a surveillance process for monitoring respiratory infection symptoms among healthcare workers. This percentage is significantly higher when compared to other types of hospitals, and this difference holds statistical significance with a p-value of 0.000. On the other hand, University Hospitals take the lead with the highest percentage (63.1%) when it comes to having explicit policies in place, visibly posted within the hospital premises, regarding social distancing and hand hygiene. This distinction also bears statistical significance, with a p-value of 0.031.

Table (1): Descriptive characteristics of the study participants

Variables	University Hospitals Total (288)	General Hospitals Total (219)	Frontline Hospitals Total (30)	Private Hospitals Total (54)	P Value
Age					
>30 year (303)	**175** (60.8%)	**98** (44.7%)	**11** (36.7%)	**19** (35.2%)	
30–45 year (238)	**98** (34.0%)	**97** (44.3%)	**15** (50.0%)	**28** (51.9%)	**0.002***
>45-60 year (41)	**12** (4.2%)	**20** (9.1%)	**4** (13.3%)	**5** (9.3%)	
>60 (9)	**3** (1.0%)	**4** (1.8%)	**0** (0.0%)	**2** (3.7%)	
Sex					
Male (441)	**220** (76.4%)	**159** (72.6%)	**18** (60.0%)	**44** (81.5%)	**0.129**
Female (150)	**68** (23.6%)	**60** (27.4%)	**12** (40.0%)	**10** (18.5%)	
Marital Status					
Single (253)	**141** (49.0%)	**81** (37.0%)	**9** (30.0%)	**22** (40.7%)	
Married (326)	**143** (49.7%)	**131** (59.8%)	**21** (70.0%)	**31** (57.4%)	**0.066**
Divorced (12)	**4** (1.4%)	**7** (3.2%)	**0** (0.0%)	**1** (1.9%)	
Job					
Physician (420)	**223** (77.4%)	**140** (63.9%)	**18** (60.0%)	**39** (72.2%)	
Pharmacist (24)	**14** (4.9%)	**6** (2.7%)	**2** (6.7%)	**2** (3.7%)	**0.066**
Nurse (112)	**35** (12.2%)	**56** (25.6%)	**9** (30.0%)	**12** (22.2%)	
Others (35)	**16** (5.6%)	**17** (7.8%)	**1** (3.3%)	**1** (1.9%)	

*P<0.050 indicates statistical significance.

Table (2): COVID-19 Transmission Risk Among Healthcare Workers (HCWs) in Various Hospital Settings

Questions	University Hospitals Total (288)		General Hospitals Total (219)		Front Lin Hospitals Total (30)		Private Hospitals Total (54)		P Value
	Yes	No	Yes	No	Yes	No	Yes	No	
Have you had a COVID-19 swab?	19.4%	80.6%	16.4%	83.6%	90%	10.0%	25.9%	74.1%	0.000*
Have you been infected with Covid-19?	11.5%	88.5%	10.5%	89.5%	66.7%	33.3%	9.3%	90.7%	0.000*
Have you been exposed to a positive case and have you been isolated?	30.9%	69.1%	37.0%	63.0%	70.0%	30.0%	40.7%	59.3%	0.000*

*P<0.050 indicates statistical significance.

Table (3): Evaluation of the Infectious Disease Preparedness and Response Plan

Questions		University Hospitals Total (288)	General Hospitals Total (219)	Frontline Hospitals Total (30)	Private Hospitals Total (54)	P Value
Does your hospital have a risk assessment matrix to identify those at highest risk?	Yes	28.8%	22.8%	35.0%	38.9%	0.018*
	No	71.2%	77.2%	65%	61.1%	
Does your hospital have a written readiness and preparedness plan on how to respond to infectious diseases?	Yes	35.4%	30.6%	46.7%	42.6%	0.161
	No	64.6%	69.4%	53.3%	57.4%	
Is there an occupational health department within the hospital where you work?	Yes	70.5%	25.1%	18.7%	7.5%	0.000*
	No	29.5%	74.95	81.3%	92.5%	
Is there an Occupational Health physician/nurse in the hospital where you work?	Yes	70.5%	25.1%	18.7%	7.5%	0.000*
	No	29.5%	74.95	81.3%	92.5%	
Does your hospital have clear written guidelines for identifying contacts of COVID-19 cases?	Yes	70.8%	71.2%	93.0%	77.8%	0.000*
	No	29.2%	28.8%	7%	22.2%	
Has the hospital established policies and procedures to isolate its employees, including doctors, nurses, and others, if they are infected with the Covid-19 virus or if they have been in contact with	Yes	70.8%	71.2%	93%	77.8%	0.000*
	No	29.2%	28.8%	7%	22.8%	

positive cases?						
Does the hospital where you work have a written and published infection control program?	**Yes**	73.8%	69.8%	91.7%	89.4%	0.000*
	No	26.2%	30.2%	8.3%	10.6%	

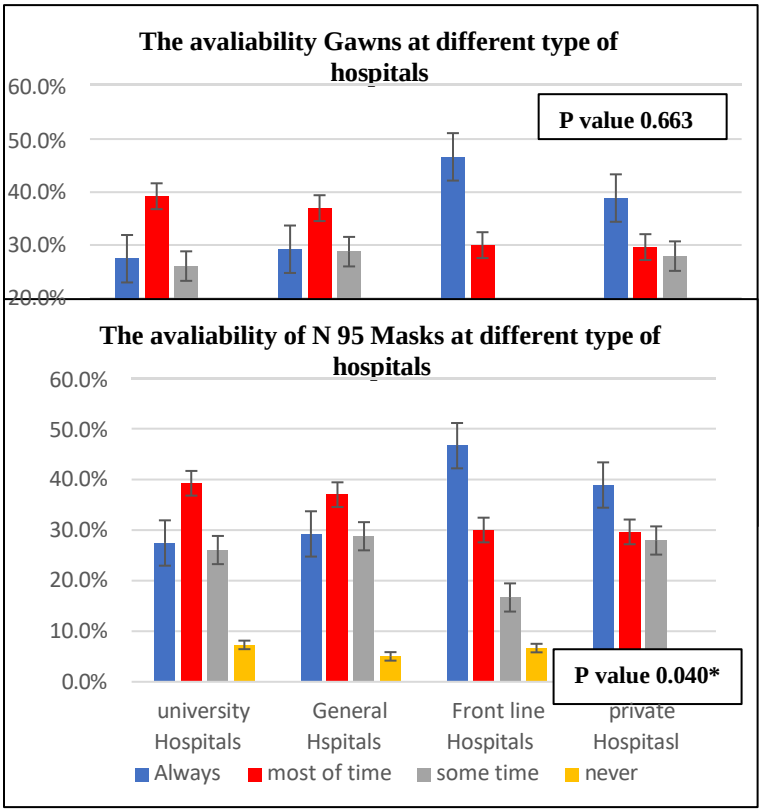
*P<0.050 indicates statistical significance.

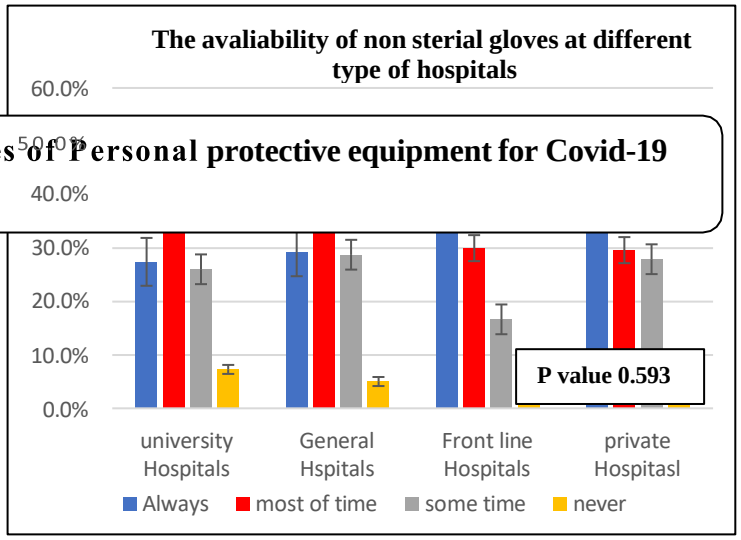
Table (4): Assessment of the surveillance tools and training programs of infection prevention and control.

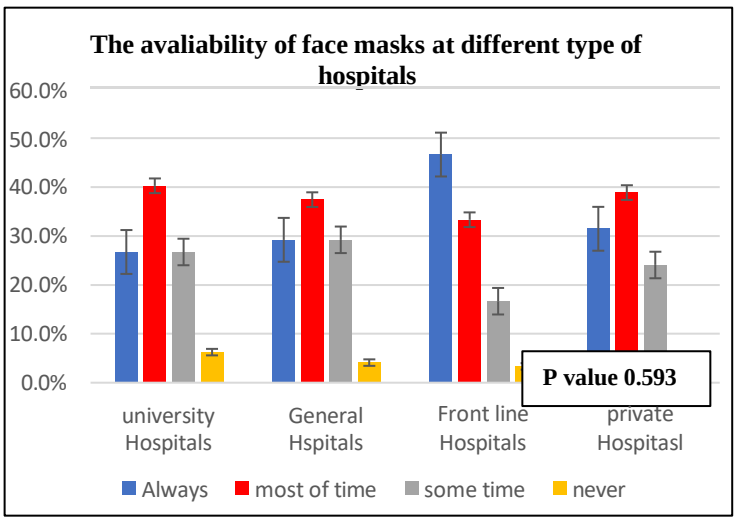
Questions		**University Hospitals** Total (288)	**General Hospitals** Total (219)	**Frontline Hospitals** Total (30)	**Private Hospitals** Total (54**)**	**P Value**
Does the hospital where you work have a written and published infection control program?	**Yes**	73.8%	69.8%	91.7%	89.4%	0.000*
	No	26.2%	30.2%	8.3%	10.6%	
Does the hospital where you work have an effective infection control team?	**Yes**	70.8%	71.2%	70.1%	77.8%	0.631
	No	29.2%	28.8%	29.9%	22.2%	
Do you agree that the surveillance tools used in the hospital are effective in preventing or controlling infection?	**Yes**	73.8%	69.8%	72.4%	75.8%	0.915
	No	26.2%	30.2%	27.6%	24.2%	
Do you think the hospital where you work is well prepared and ready to deal with any outbreak?	**Yes**	51.2%	48.4%	76.4%	49.1%	0.000*
	No	48.8%	51.6%	23.6%	50.9%	
Have you received any form of training on infection prevention and control?	**Yes**	38.2%	45.2%	60.0%	11.1%	0.000*
	No	61.8%	54.8%	40.0%	88.9%	
Have you received any training on the correct way to wear and remove personal protective equipment?	**Yes**	33.0%	32.0%	36.7%	27.8%	0.840
	No	67.0%	68.0%	63.3%	72.2%	
Does your organization provide you with updated protocols and information regarding coronavirus (COVID-19)?	**Yes**	69.0%	72.1%	70.0%	61.1%	0.466
	No	31.0%	27.9%	30.0%	38.9%	

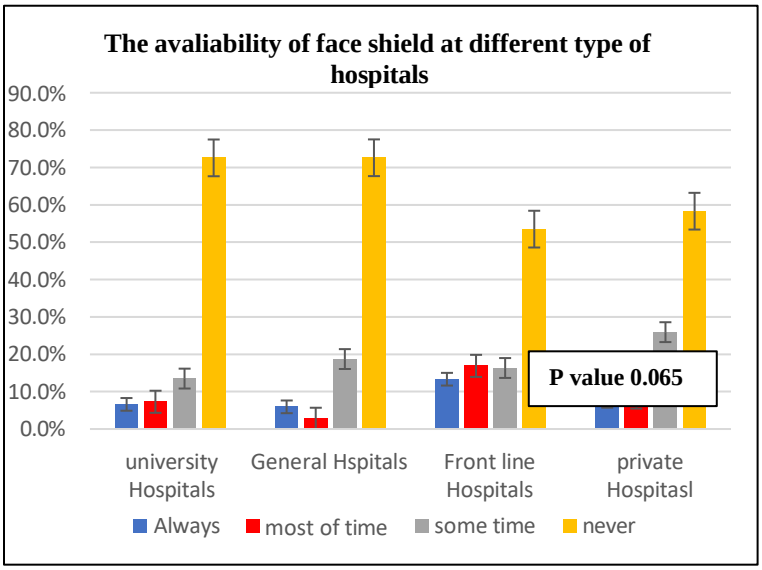
*P<0.050 indicates statistical significance.

Figure (1): Assessment the availability of different types of Personal protective equipment for Covid-19 (PPE) in different hospital types









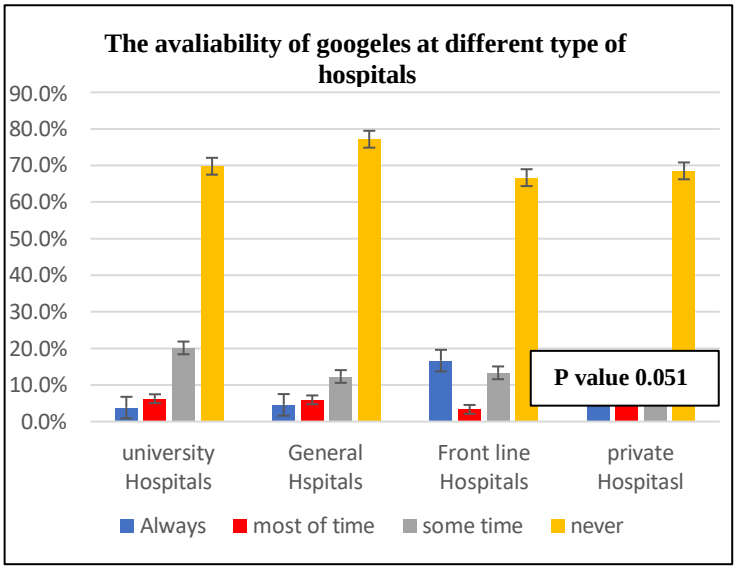


Table (5): Evaluation of the existence of administrative controls, policies, and procedures for positive cases, identification of close contacts, triage, and enforcement of social distancing measures.

Questions		University Hospitals Total (288)	General Hospitals Total (219)	Frontline Hospitals Total (30)	Private Hospitals Total (54)	P Value
Are any physician assigned to emergency to triage patients, isolating patients with acute respiratory symptoms (fever, cough, shortness of breath, sore throat) into separate waiting and assessment areas to minimize contact with hospital staff?	**Yes**	69.0%	72.1%	78.0%	61.1%	0.131
	No	31.0%	27.9%	22.0%	38.9%	
Is there a surveillance process for symptoms of respiratory infections that may be due to Covid-19 among health sector workers within the hospital where you work?	**Yes**	70.9%	68.8%	95.7%	74.8%	0.000*
	No	29.1%	31.2%	4.6%	25.2%	
Is there a policy within the organization where you work to grant sick leave to the most vulnerable categories of hospital workers during the pandemic (such as those with chronic diseases, respiratory patients, immunocompromised patients, and pregnant women)?	**Yes**	37.8%	32.4%	25.5%	38.9%	0.282
	No	62.2%	67.6%	74.5%	61.1%	
Is there a change in the schedule of health care workers that allows medical teams to be divided into groups that take turns working to protect the medical teams from the spread of infection?	**Yes**	53.5%	55.7%	60.0%	72.2%	0.082
	No	46.5%	44.3%	40.0%	27.8%	
Are there specific policies, written and posted in visible places within the hospital in which you work, urging hospital workers to practice social distancing and wash hands and use soap?	**Yes**	63.1%	57.9%	36.7%	53.7%	0.031*
	No	36.9%	42.1%	63.3%	46.3%	

*P<0.050 indicates statistical significance.

DISCUSSION

The healthcare systems in the Eastern Mediterranean region encounter a range of multifaceted challenges. Consequently, there is a requirement for regular evaluations of hospitals' preparedness to handle pandemics. This approach will empower policymakers to make well-informed decisions aimed at enhancing hospitals' readiness to address different types of pandemics, thus establishing a robust and resilient healthcare system.

In our study, we addressed the occupational health challenges encountered by healthcare workers (HCWs) in various Egyptian hospitals, while recent studies conducted in the Netherlands and the UK have reported varying prevalence rates of COVID-19 among healthcare workers

(HCWs), ranging from 9% to 18%, respectively [12,13], our study, revealed a significantly higher prevalence rate of 66.7% in Frontline Hospitals. This disparity highlights the heightened risk faced by HCWs when directly providing care to COVID-19 patients. This risk aligns with earlier research from China, which indicated that HCWs are at an elevated risk of virus exposure within healthcare settings and can potentially transmit the virus to patients [14].

Furthermore, our study revealed differences in readiness and preparedness levels across different hospital types, notably with Frontline Hospitals exhibiting superior preparedness in key aspects related to COVID-19, such as risk assessment, guidelines, and policies (with rates of 35%, 93%, and 91.7% compliance, respectively). These findings hold significant scientific value as they can offer valuable insights into enhancing infectious disease preparedness within the broader context of Egyptian healthcare facilities. The outcomes of our study do not align with the findings of a study conducted in Jordan [15], which revealed that the hospitals' general preparedness level for the management of COVID-19 pandemic was moderate levels across hospitals, this variance can be attributed to the efficient dissemination of pandemic-related updates and information within these hospitals, in contrast to other healthcare institutions.

On the flip side, our study found that most hospitals, except for university hospitals with a high percentage of 70%, lack Occupational Physicians (Ops) or occupational nurses (with percentages of 25.1%, 18.7%, and 7.5%, respectively). This discovery doesn't align with the crucial role played by Occupational Physicians (Ops), which, despite being vital during the pandemic, is often overlooked [16]. Occupational Physicians are essential professionals within multidisciplinary occupational health teams. Their training and core skills have evolved to adapt to the ever-changing work environment and to meet society's needs. The World Health Organization's European Centre for Environment and Health (ECEH) defines Occupational Physicians as specialists who assess the health of workers, connect working conditions to workers' health, assist in managing the health, skills, and working capacity of the entire working population, and handle individual cases related to workability and production. In essence, they focus on preventing health issues among workers, which can have a positive impact on the overall health of the population [17].

Interestingly, the finding in our study illustrated that Training in infection prevention and control shows significant disparities among hospital types. Frontline Hospitals leading in the percentages of HCWs who received such training (60.0%), while Private Hospitals lagged behind (11.1%), which is not in consistent with another study showed that most of the frontline nurses who provided nursing care for patients diagnosed with COVID-19 had limited information about COVID-19 at the onset of the pandemic because they were not given adequate training before they were deployed to the COVID-19 treatment center to provide care [18]. On the other hand, a previous study revealed that frontline nurses had limited information and insufficient knowledge of COVID-19 [19], The rationale behind these results could be because the current study's commencement lies in its initiation after a considerable period following the declaration of the COVID-19 pandemic. This delay presented healthcare workers with the chance to gain current knowledge and undergo more extensive training concerning COVID-19. These results correspond with concerns articulated

in previous research [20], about the imperative requirement for standardized training protocols to ensure that all healthcare workers receive adequate training in infection prevention and control.

In our study, we noted a consistent availability of personal protective equipment (PPE) in the majority of hospitals, especially in Frontline Hospitals. However, there is a notable scarcity of N-95 masks in most healthcare facilities. These results align with study conducted in the United Kingdom (UK), which revealed that 83.9% of healthcare workers (HCWs) consistently have access to PPE. It also underscores the global commitment to providing healthcare workers with the necessary protective measures to ensure their health and well-being.

Regarding evaluation of the existence of administrative controls, policies, and procedures for positive cases, identification of close contacts, triage, and enforcement of social distancing measures at different hospital types, the current study revealed that the majority of hospitals achieved good compliance agreed with a study conducted Indonesia [22] , indicating full compliance with the regulations that minimize the spread of COVID-19 in the workplace and mitigate its impact on various aspects in the form of applying strict administrative control, following policies and procedures related to covid19 and apply triage system in the emergency ,also enforcement of social distancing

CONCLUSION

In conclusion, this study sheds light on the occupational health challenges faced by healthcare workers (HCWs) in various types of hospitals in Egypt during the COVID-19 pandemic. It reveals that the prevalence of COVID-19 among HCWs was notably high in Frontline Hospitals, underscoring the increased risk faced by those directly caring for COVID-19 patients. Moreover, our findings highlight disparities in readiness and preparedness levels across different hospital types, with Frontline Hospitals demonstrating superior preparedness in key areas. Despite the availability of personal protective equipment (PPE) in most hospitals, there remains a shortage of N-95 masks, suggesting the importance of maintaining a consistent and adequate supply of essential protective gear. Additionally, training in infection prevention and control showed varying levels of implementation among hospital types, emphasizing the need for standardized and comprehensive training protocols for all HCWs. Furthermore, the study revealed variations in the presence of occupational health professionals, such as Occupational Physicians (Ops) or nurses, within hospitals. These professionals play a crucial role in safeguarding the health and well-being of HCWs and should be more widely integrated into healthcare settings.

Conflict of Interest and Financial Disclosure

There was no conflict of interest.

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