# Challenges and Personal Protective Equipment among Healthcare Professionals during the COVID-19 Pandemic

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### Abstract

Background: The last line of defense against risks is frequently regarded as personal protective equipment (PPE). Therefore, there is a shortage of PPE in places with high demand because of COVID-19's widespread nature. Objective: The aim of the study was to address the shortage of personal protective equipment (PPE), as well as to identify factors that increased the risk of mental health problems among healthcare workers during coronavirus disease 19 (COVID-19). Materials and Methods: A cross-sectional study was conducted from June 22nd to August 22nd, 2020, in Iraqi Kurdistan region. A total of 337 healthcare professionals participated in an online survey that included questions about socio-demographic information, personal protective measures, and risk factors for mental health issues. SPSS software version 24.0 was used to analyze data. Results: The majority of healthcare professionals 196 (58.2%) were men. The majority of the population was aged 25–34 years 211 (62.6%), with nursing, representing the highest percentage among all professions 151 (44.8%). At least 46.6% of the participants reported a lack of PPE. The most common shortages reported were hats, boots, N95 masks, goggles, and face shields. A significant positive correlation (r = 0.181, P = 0.001) was observed between direct contact with COVID-19 patients and the spreading of fear and panic among healthcare professionals due to their concerns about transmitting the virus to their relatives. Also, results revealed that healthcare professionals' non-receive training on the ways of facing the COVID-19 crisis was another risk factor affecting healthcare professionals' mental health in all hospitals (r = 0.119, P = 0.001). Conclusion: According to the current study, healthcare professionals lacked the resources needed to treat COVID-19 patients. To avoid healthcare professionals' mental health problems during medical emergencies, the government should take action, especially the Ministry of Health, which should address the challenges in the case of a future health crisis.

Keywords: COVID-19, healthcare professionals, Kurdistan region, mental health problems, PPE

#### INTRODUCTION

In a wet market in Wuhan, Hubei province, In December 2019, the outbreak of coronavirus disease 19 (COVID-19) was recorded.<sup>[1,2]</sup> In only a short period, the disease caused by the virus was considered a well-being crisis by the World Health Organization (WHO)<sup>[3]</sup> and was announced as a pandemic communicable disease by March 2020.<sup>[4]</sup> With the increase in confirmed patients and suspected cases, the overwhelming workload leads to a reduction in personal protective equipment (PPE) and tools.<sup>[5]</sup> Because of the rapid worldwide spread and lack of particular treatment for COVID-19, a rise in infections among the general public and healthcare workers (HCW) prompted the implementation of social isolation policies for the

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public and PPE policies for HCWs. The WHO released preliminary advice for PPE use in February 2020.<sup>[6]</sup> The last line of defense against risks is frequently regarded as PPE.<sup>[7]</sup> Therefore, there is a shortage of PPE in places with high demand because of COVID-19's widespread nature. PPE production and supply must be increased to keep up with the sudden surge in demand. Owing to time or cost restrictions, many healthcare institutions do

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not offer PPE. There have been several stories of HCWs protesting the absence of suitable PPE and occasions where physicians and other medical professionals were compelled to operate without this priceless resource.<sup>[8]</sup> Besides, it is already evidenced that the direct and indirect psychological and social effects of the rapidly spreading diseases including the COVID-19 pandemic are pervasive and could affect an individual's psychological and physical well-being.<sup>[9,10]</sup>

Health professionals on the front line who are directly in contact with the treatment, diagnosis, and care of patients with COVID-19 are at higher risk of experiencing psychological distress and other mental health symptoms.<sup>[11]</sup> Generally, the worldwide healthcare systems, particularly those in Kurdistan Region, are facing enormous challenges as a result of this pandemic. There is a critical shortage of PPE supplies during the COVID-19 pandemic, including disposable gloves, gowns, surgical masks, and alcohol-based hand sanitizers according to a study in Kurdistan region.<sup>[12]</sup> Therefore, the current study aims to assess PPE and the risk factors of developing fear among healthcare professionals during the COVID-19 pandemic in Kurdistan region, Iraq.

## MATERIALS AND METHODS

#### Study design and participants

A cross-sectional study was conducted among healthcare professionals from June 22nd to August 22nd, 2020. A total of 377 samples who worked in different hospitals in Kurdistan region from Duhok, Erbil, Sulaymaniyah, and Halabja governorates were enrolled. A self-administered questionnaire was made using Google Forms and was distributed using Google forms via email and social media platforms (Viber, Facebook, messenger, and what's up.). The questionnaire was prepared in the English and Kurdish languages to allow potential participation in the study. Samples were collected from different pages that related to health namely, hospitals, nursing, doctors, HCWs, etc. Participants were allowed to terminate it at any time they desired. Verbal informed consent was obtained by all survey participants before their enrollment at the top of the online questionnaire.

#### **Data collection**

To fulfill the study's goals and objectives, the authors created a structured questionnaire with three main sections. Some of the questions were also adapted from earlier research.<sup>[8]</sup> The first section was regarding sociodemographic characteristics (age, gender, occupation, province, working time, etc.). The second section of the survey included questions to determine the accessibility of various PPE items, such as gloves, N95 masks, surgical masks, goggles, face shields), and gowns. And other risk factors during the COVID-19 pandemic for HCWs such as whether their work environment and habits have impacted their mental health. The final section of the questionnaire was questioned about sources of information about COVID-19 during the pandemic and the platforms that individuals utilized the most frequently.

### Statistical analysis

Statistical Package for Social sciences (SPSS) version 23.0 (IBM Corporation, Armonk, New York, USA) was used for data classification and testing. Descriptive content analysis was used to analyze the data. The data were considered statistically different if the probability value was less than 0.05.

### RESULTS

A total of 337 HCWs were included from different regions in Kurdistan region, Iraq, (32.9%) from Duhok, (38.3%) from Erbil, (23.1%) from Sulaymaniyah, and (5.6%) from Halabja as shown in Table 1. Furthermore, the ratio of males was (58.2%) and the ratio of females was (41.8%). The vast majority of participants were aged 25–34 years (62.6%). According to their profession, the healthcare professionals were divided into four categories. Nursing recorded the highest percentage among professionals (44.8%), whereas pharmacists come in last by recording the lowest one (8.9%). About (38.8%) of the studied population was at work full-time shifts; also 38.3% had contact with COVID-19 patients at the

Table1: Demographic characteristics of study participants $(n = 337)$				
Variables	Number (%)			
Gender				
Male	196 (58.2)			
Female	141 (41.8)			
Age groups (years)				
18–24	44 (13.1)			
25–34	211 (62.6)			
35–44	64 (19.0)			
45–54	17 (5.0)			
55–64	1 (0.3)			
Profession				
Physician	94 (27.9)			
Nursing	151 (44.8)			
Pharmacist	30 (8.9)			
Other Specify	62 (9.5)			
Province				
Duhok	111 (32.9)			
Erbil	129 (38.3)			
Sulaymaniyah	78 (23.1)			
Halabja	19 (5.6)			
Working days per week				
Part-time shift	206 (61.1)			
Full-time shift	131 (38.8)			

 Table 2: Frequency of protection measures provided by hospitals to health staff

Protection measures	No. (%)
Medical Gown	
Yes	172 (51.0)
No	165 (49.0)
Boots	
Yes	44 (13.1)
No	293 (86.9)
Hats	
Yes	44 (13.1)
No	293 (86.9)
Surgical mask	
Yes	217 (64.4)
No	120 (35.6)
N95 mask	
Yes	70 (20.8)
No	267 (79.2)
Cloth mask	
Yes	79 (23.4)
No	258 (76.6)
Goggle	
Yes	37 (11.0)
No	300 (89.0)
Face shield	
Yes	39 (11.6)
No	298 (88.4)

# Table 3: Responses of healthcare staff to some questions regarding PPE and COVID-19

Questions	Yes (%)	No (%)
Q6. Do hospitals provide all personal protective measures for their staff?	180 (53.4)	157 (46.6)
Q7. Have you received prior training in protective measures and dealing with COVID-19 patients?	95 (25.1)	242 (64.1)
Q8. Does non-receive training increase your fear and worries?	199 (59)	138 (40.9)
Q9. Do you worry too much about transmitting the Virus to your relatives?	289 (85.7)	48 (14.2)
Q10. Are your PPE makes you feel more depressed or anxious or stressed?	162 (48)	175 (51.9)
Q11. Do you receive information regarding COVID-19 on social media?	233 (61.8)	104 (30.8)
Q12. Does receiving information from social media constantly make you feel anxious or depressed?	266 (78.9)	71 (21.1)
Q13. Are you losing interest or pleasure in your work and daily life?	213 (63.2)	164 (48)

time of the study. The frequency of protection measures provided by hospitals shows that surgical mask was the most common protection measure provided to health staff (64.4%), where goggles were the least common one (11%) [Table 2].

 Table 4: Accounting some questions according to profession

 of healthcare professionals

Profession	Physician	Nursing	Pharmacist	Others	Total No.		
Q6. Do hospitals provide all personal protective measures for their							
staff?							
Yes	44 (24.44)	85 (47.22)	10 (5.56)	41 (22.78)	180		
No	50 (31.84)	66 (42.04)	20 (12.74)	21 (13.38)	157		
Q7. Have yo	u received p	rior training	on protective	e measures a	and		
dealing with	COVID-19	patients?					
Yes	28 (29.48)	46 (48.44)	6 (6.31)	15 (15.77)	95		
No	66 (27.27)	105 (43.38)	24 (9.92%)	47 (19.43)	242		
Q8. Does no	on-receive tra	aining increa	se your fear a	and worries	?		
Yes	45 (22.61)	98 (49.24)	21 (10.56)	35 (17.59)	199		
No	49 (35.50)	53 (38.41)	9 (6.53)	27 (19.56)	138		
Q9. Do you	worry too n	nuch about ti	ansmitting tl	ne Virus to	your		
relatives?							
Yes	87 (30.10)	130 (44.99)	25 (8.66)	47 (16.25)	289		
No	7 (14.58)	21 (43.76)	5 (10.41)	15 (31.25)	48		
Q10. Are yo	ur PPE mak	es you feel m	nore depresse	d or anxiou	s or		
stressed?							
Yes	41 (25.31)	76 (46.91)	15 (9.26)	30 (18.52)	162		
No	53 (30.28)	75 (42.86)	15 (8.57)	32 (18.29)	175		
Q11. Do you receive information regarding COVID-19 on social							
Yes	67 (28 7)	114 (48 9)	21 (9)	22 (94)	233		
No	27 (25.9)	37 (35 5)	9 (8 6)	31 (29.8)	104		
O12 Does r	eceiving info	ormation from	n social medi	ia constantl	v make		
vou feel anxious or depressed?							
Yes	73 (28.7)	122 (48.9)	25 (9)	46 (9.4)	266		
No	21 (25.9)	29 (35.5)	5 (8.6)	16 (29.8)	71		
Q13. Are you losing interest or pleasure in your work and daily life?							
Yes	56 (26.2)	94 (44.1)	21 (9.8)	42 (19.7)	213		
No	43 (26.2)	72 (43.9)	17 (10.3)	32 (19.5)	164		

Table 3 shows that the healthcare staff (47.7%) have access to PPEs in their hospitals. And only about 25.1% received prior training on protective measures during the COVID-19 pandemic. Over half (59%) said that not receiving prior training increases fear and worries. Furthermore, an overwhelming majority (85.7%) had fear of transmitting the disease to their relatives, and 48% were uncomfortable with wearing PPEs. The vast majority (61.8%) of participants use social media as a source of information, and about two-thirds 63.2% lost interest in their work and daily activity. In terms of profession of health staff, Table 4 shows that physicians and pharmacists responded 'yes' more than 'no' to question 6, whereas the results show the inverse responses for nurses and other specifies. Considering question 7, the majority selected 'no' response rather than 'yes'. For question 8, nurses, pharmacists, and other specifies responded 'yes' more than 'no' while the response of physicians was approximately the same. Furthermore, the result of responses to question 9 indicates that all specifies responded yes more than no. Considering question 10, the physicians chose no response over yes response, while no difference was observed between



Figure 1: Correlation analysis of the impact of direct contact with patients on spreading worries about relatives among healthcare professionals



Figure 2: Correlation analysis of the impact of non-receiving training on increased fear and panic among healthcare professionals

yes and no responses for nurses, pharmacists, and other specifies. Regarding questions 11 and 12 yes answers were more common than yes with no differences for health staff.

The presence of a significant positive correlation between questions 2 and 9 (r = 0.181, P = 0.001) revealed that direct contact with COVID-19 patients played a vital role as a risk factor for spreading fear and panic among healthcare professionals due to their concerns about transmitting the virus to their relatives [Figure 1].

Figure 2 illustrates the presence of a significant positive correlation between questions 7 and 8 (r = 0.119, P = 0.001). This finding proposes that non-receive training of healthcare professionals on the ways of facing the COVID-19 crisis was another risk factor affecting the mental health of healthcare professionals in all hospitals. Figure 3 illustrates the frequency of usage of several social media platforms with Facebook having the highest percentage of users (84.3%), Instagram coming in second with 54 users, and TikTok having the lowest percentage (0.9%) [Table 2].

#### DISCUSSION

The adequate use of PPE is one of the most effective methods for defending patients and HCWs from



**Figure 3:** Social media platforms as a source of information during COVID-19 pandemic

communicable diseases. WHO recommends gowns, gloves, masks, goggles, face shields, head covers, and rubber boots, because COVID-19 is spread by contact or droplet and has no cure, PPE is the sole serious and important concern for HCWs.<sup>[13]</sup> Additionally, a surgical mask is the most common protective measure provided for medical staff in all hospitals of Kurdistan region. As is seen from the outcomes that the highest percentage 217 (64.4%) of the participants only had a chance to use surgical masks to take care of themselves, whereas the rest of the protective measures recorded a lower rate (46.6%) of use. Frequent shortages were in N95 masks, boots, hats, and eve protection (goggles and face shield). Furthermore, the ability of hospitals to provide all personal protective measures only for a few numbers of the medical staff and insufficient protection against infection exert a further negative impact on the medical staff. This shortage was still in the beginning of the pandemic and would worsen with time and when more cases diagnosed.

In the early waves of the COVID-19 pandemic, a shortage of PPEs in Kurdistan region was declared as an urgent need.<sup>[14]</sup> The PPE crisis in Iraq has already been documented in an earlier study which obliged HCWs to buy PPE on the private market, which has resulted in a sharp rise in price,<sup>[15]</sup> also, in Iran.<sup>[16]</sup> Similar findings were found in research with a large sample size that included participants from three different nations. The most prevalent shortages were of gown overall suits, N95 masks, and face shields.<sup>[17]</sup> Despite several alerts about a potential influenza pandemic shortly, the authorities' lack of readiness may be part of the issue.<sup>[18]</sup> Additionally, Kurdistan region heavily relied on imports of PPEs from China, and the travel and export restrictions that are preventing commerce are another significant factor for the issue.<sup>[12]</sup> Healthcare professionals' responses to several concerns did not differ in any way; they were nearly similar. It implies that throughout the pandemic, healthcare professionals deal with the same situation.

From the study findings, it is concluded that direct exposure to the virus is considered one of the main reasons for spreading fear and panic among medical professionals and their worries for family members during this pandemic and had a significant impact (r = 0.181, P = 0.001). As the majority of health professionals in the Kurdistan region live with their family and relatives. This finding was in line with other studies.<sup>[19-21]</sup> Also supported by,<sup>[22]</sup> studies done in Australia and China reported that the fear of infecting family members was the most powerful and predictive of all three criteria.<sup>[23]</sup> Moreover, results indicated the presence of a significant positive statistical correlation (r = 0.119) (*P*-value: 0.001) between none receiving prior training and the spread of fear and worries; this was in agreement with other studies.<sup>[4,24]</sup> However, was contradicts the results of a recently published study among HCWs in the UK.<sup>[25]</sup> Therefore, the study confirms that non-receive training on how to face this public health crisis was another stressful factor that can massively affect the psychological well-being of medical staff. The majority of participants received information on social media, particularly Facebook which triggered fear and anxiety. Early in the spread of COVID-19, the effects of social media in general and acquiring incorrect information from dubious websites or nonscientific sources contribute to the emergence of mental health issues. During the public health crisis, it is essential to ban internet information without a basis in science across all social media networks.[26,27]

### CONCLUSION

In general, healthcare professionals work on the front line and they are at high risk of infection and more liable to affect by any health crisis. Accordingly, the study results conclude that the government should pay particular attention to provide regular and intensive training for all staff is critical. Adequate protective supplies with continuous medical education are required. These points collectively are quite helpful to ensure medical teams are sufficiently prepared psychologically and physically to deal with public health emergencies and are essential to promote readiness and effectiveness in crisis management.

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#### **Conflicts of interest**

There are no conflicts of interest.

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