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Psychological impact of the covid-19 pandemic on healthcare workers in Kuwait

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ABSTRACT

Objective: In this study, we aim to assess the prevalence of depression and anxiety among Health care workers during the COVID-19 outbreak in Kuwait.

Methods: The study is a cross-sectional survey. An anonymous self-reported online questionnaire was administered. Patient Health Questionnaire-4 (PHQ-4) was used for assessment in addition to collecting demographic data and other data related to physical health and workplace characteristics. The fears of getting COVID-19 infection or transmitting the infection to their families was also assessed.

Results: Altogether, 607 Health care workers completed the survey. The estimated prevalence of severe anxiety and depression was 26.9% (moderate to severe 54%). Younger ($p<0.001$), female ($p< 0.001$) Health care workers occupying junior grade jobs ($p= 0.001$) tended to show higher prevalence of anxiety and depression. Frontline Health care workers who did not receive personal protective equipment training ($p< 0.001$) or those who reported being forced to join frontlines ($p= 0.002$) had higher anxiety and depression scores. Risk factors for severe anxiety and depression included being physician (Odds ratio [OR] 2.55; $p = 0.027$) and younger age group (OR, 2.53; $p<0.001$). We found a significant correlation between PHQ-4score and the perceived fear of being infected ($r = 0.53$, $p <0.001$) or transmitting the infection to their families ($r = 0.49$, $p <0.001$).

Conclusion: Our study showed a high prevalence of anxiety and depression among Health care workers in Kuwait. Young female Health care workers showed a higher prevalence of anxiety and depression during this pandemic.

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KEYWORDS

Coronavirus, COVID-19, Anxiety, Depression, Health Care Workers.

Introduction

At the end of 2019, a cluster of pneumonia cases in Wuhan, China caused by a novel coronavirus disease (SARS-CoV-2 or COVID-19) was first identified and by March11th ,2020, the World Health Organization declared the outbreak a pandemic [1].

As of May 30th ,2020, there are 25184 confirmed cases of COVID-19 in Kuwait [2]. The psychosocial responses of the public towards infectious disease outbreaks include anxiety, depression, panic, and irritability [3]. In a public survey during the COVID-19 outbreak in China, half of the respondents rated the psychological impact as moderate to severe, 28.8% reported moderate to severe anxiety symptoms, and 16.5% reported moderate to severe depressive symptoms [4]. Healthcare workers (HCWs) who are taking care of patients with COVID-19 are at a higher risk of infection than the public as COVID-19 is transmissible from human to human by close contact [5]. HCWs at the frontline perceive personal danger due to many factors including the high transmissibility and morbidity of the illness, perceived fatality, the expected shortage of personal protective equipment (PPE), lack of specific treatment, and the foreseeable increasing flow of COVID-19 cases. In addition, the long working hours, the physical exhaustion, and the need to make ethically difficult decisions on the rationing of care will have a profound effect on their mental health [6,7]. Experience from previous epidemics indicates that the psychological impact on HCWs is significant. In one study during the H1N1 influenza pandemic, 56.7% of HCWs reported a moderately high degree of anxiety [8]. In another study during the rapid expansion phase of the Severe acute respiratory syndrome (SARS) outbreak, 62% and 81% of HCWs reported somatic and cognitive symptoms of anxiety, respectively. Depression and poor family relationships were found among 68% of HCWs [9]. HCWs dealing with COVID-19 are under increased psychological pressure resembling the situation during the SARS and H1N1 epidemics. A recent study in China revealed a high incidence of anxiety (23%) and stress disorders (27%) among frontline medical staff during the COVID-19 epidemic [10]. There have been reports of HCWs suicides as they faced an accumulating psychological pressure during the COVID-19 pandemic [11]. An immediate priority is collecting data on the mental health

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of HCWs during the COVID-19 pandemic. In our study, we attempted to assess the psychological impact of COVID-19 pandemic on HCWs dealing with confirmed or suspected COVID-19 patients in Kuwait.

Subjects and Methods

Participants and questionnaire items

The study was a cross-sectional survey. Data were collected starting from April 29th to May 19th,2020, a time when Kuwait was officially declared to have COVID-19 pandemic. [2] All HCWs who were on service during the pandemic were invited to participate. To assess HCWs' concerns over the pandemic, and whether these concerns were associated with psychological distress, an anonymous self-reported online questionnaire was administered. The questionnaire consisted of five parts: (1) consent to participate, (2) basic demographic data, workplace characteristics, and whether they are a frontline medical staff or not. (3) frontline HCWs "COVID teams" were further asked about how they joined and if they received any infection prevention and control (IPAC) or PPE training before joining, (4) general information about physical health, (5) the last section included the Patient Health Questionnaire-4 (PHQ-4) and also, to assess the perceived fear of infection, two items were scored on a 4-point Likert scale from not at all (0) to nearly every day (3). We asked the participants to grade their fears of getting COVID-19 infection or transmitting the infection to their families.

To assess for anxiety and depression among HCWs, we used the PHQ-4 which is a 4-item inventory rated on a 4-point Likert scale. Its items are the first two items of the Generalized Anxiety Disorder–7 scale (GAD–7) and the first two items of the Patient Health Questionnaire-8 (PHQ-8). It is a brief questionnaire that consists of a 2-item depression scale (PHQ-2) and a 2-item anxiety scale (GAD-2). In our study, PHQ-4 score of (0-2) was considered to have no-to-minimal anxiety and depression, a score of (3-5) was considered to have mild anxiety and depression, a score of (6-8) was considered to have moderate anxiety and depression, and a score of (9-12) was considered to have severe anxiety and depression. For individual calculation of PHQ-2 and GAD-2 scores, we considered a score of 3 or greater to be indicative of depression and anxiety symptoms, respectively [12,13]. The confidentiality of information was assured. The study was approved by the ethics and research committee of the department of medicine, Jahra hospital.

Statistical analysis

We collected a total of 626 responses including duplicate responses (n=16), and those who refused to enroll (n=3). We ended up with 607 valid responses after the removal of duplicate responses and responses from participants who did not agree to enroll in the survey. The target sample size was determined to be 600 responses to achieve a confidence level of 95%, and a margin of error of 4%. Validated data (n=607) were collected, tabulated, entered, and analyzed using Statistical Package for the Social Sciences (SPSS) software (version 22) and presented. Normally distributed numerical data were expressed as mean and standard deviation (SD) while non normally distributed numerical data were expressed as the median and interquartile range (IQR) when appropriate. A non-parametric test was used for the analysis of quantitative data (Mann-Whitney U test) when needed. Chi-square test was used to test the impact of different variables on the prevalence of anxiety and depression among the responses obtained. To determine potential risk factors for depression/anxiety among respondents, multivariable logistic regression analysis was performed, and the associations between risk factors and outcomes are presented as odds ratios (ORs) and 95% confidence intervals (CIs), after adjustment for confounders, including sex, age, marital status, job grade, and working position (frontline or non-frontline HCWs).

Results

Demographic characteristics

A total number of 607 HCWs, working in facilities dealing with suspected or confirmed COVID-19 patients in Kuwait, agreed to participate in the survey with a mean age of 38.36 (±9.96) years. Participants in the survey vary in their demographic and workplace characteristics and this is summarized in Table 1. The study sample includes a variety of respondents representing different age groups, gender, and marital status. Also, different workplace characteristics were represented including different jobs, job grades, and work positions (whether frontline COVID-team or non-frontline medical staff).

In terms of physical health, it was important to look for the prevalence of smoking and chronic medical conditions in the study group. 14.7% of the participants smoke (n=89). 63.4% have no previously known medical conditions (n=385) while 36.6% have (n=222). Some of the participants may have more than one medical condition at the same time e.g., hypertension and diabetes mellitus. Data is summarized in Figure 1.

About 22.5% of HCWs having medical conditions reported worsening of their condition (n=50) and 64% of them (n=32) agreed or strongly agreed that this worsening is related to COVID-19 pandemic in a way or another as shown in Figure 2.

Severity of Measurements and Associated Factors

Using the PHQ-4 scoring system, 26.9 % of responses showed severe anxiety and depression (n=163). This prevalence increases to 54% when considering moderate to severe anxiety and depression (n= 328). Younger ($p < 0.001$), female ($p < 0.001$) HCWs occupying junior grade jobs ($p = 0.001$) tend to show higher prevalence of anxiety and depression. However, anxiety and depression were not related to whether the HCW is a frontline HCW or not (p=0.671). Further subgroup analysis among frontline HCW showed that anxiety and depression was significantly higher among those who did not receive IPAC/PPE training before joining ($p < 0.001$) or those who reported being forced to join the team against their well ($p = 0.002$) as demonstrated in Table 2. By analyzing the subscores, GAD-2 and PHQ-2, we found that 63% of the participants had anxiety (n=363) while 53% had depression (n= 321). Among the responses showing moderate to severe anxiety and depression using the PHQ-4 scale, about 80% agree or strongly agree that it is COVID-19 related (n=261).

Scores of Measurements and Associated Factors

PHQ-4 score and its subscores, PHQ-2 and GAD-2, among COVID team members expressed as median (IQR) were 6 (4-9), 3 (1-4), 4 (2-5) while in non-COVID team members were 6 (3-9), 3 (1-4),

Table 1: Demographic and workplace characteristics among respondents to the survey.

Characteristic	Total No. (%)	Occupation		
		Physician	**Nurse**	**Others**
Overall	607 (100)	454 (74.8)	95 (15.7)	58 (9.5)
Sex				
Men	344 (56.7)	275 (60.6)	34 (35.8)	35 (60.3)
women	263 (43.3)	179 (39.4)	61 (64.2)	23 (39.7)
Age (years)				
25 and below	17 (2.8)	10 (2.2)	4 (4.2)	3 (5.2)
26-35	271 (44.6)	198 (43.6)	43 (45.3)	30 (51.7)
36-45	193 (31.8)	149 (32.8)	29 (30.5)	15 (25.9)
46-55	80 (13.2)	56 (12.3)	19 (20)	5 (8.6)
56 and above	46 (7.6)	41 (9.1)	0 (0)	5 (8.6)
Marital status				
Single	158 (26)	126 (27.8)	11 (11.6)	21 (36.2)
Married	449 (74)	328 (72.2)	84 (88.4)	37 (63.8)
Job grade				
Junior (< 5years)	123 (20.3)	96 (21.1)	11 (11.6)	16 (27.6)
Intermediate (5-9 years)	131 (21.6)	97 (21.4)	24 (25.3)	10 (17.2)
Senior (≥ 10 years)	353 (58.2)	261 (57.5)	60 (63.2)	32 (55.2)
Working position				
Frontline (COVID team)	275 (45.3)	216 (47.6)	41 (43.2)	18 (31.0)
Non-frontline	332 (54.7)	238 (52.4)	54 (56.8%)	40 (69.0)
Way of joining COVID team				
Volunteered	56 (20.4)	43 (19.9)	2 (4.9)	11 (61.1)
Nominated	188 (68.4)	149 (69)	32 (78)	7 (38.9)
Forced against their well	13 (4.7)	7 (3.2)	6 (14.6)	0 (0)
Others (places assigned for COVID service by default)	18 (6.5)	17 (7.9)	1 (2.5)	0 (0)
IPAC/PPE training before joining				
Received training	210 (76.4)	164 (75.9)	29 (70.7)	17 (94.4)
No training	65 (23.6)	52 (24.1)	12 (29.3)	1 (5.6)

COVID: novel coronavirus disease; **IPAC:** infection prevention and control; **PPE:** personal protective equipment.

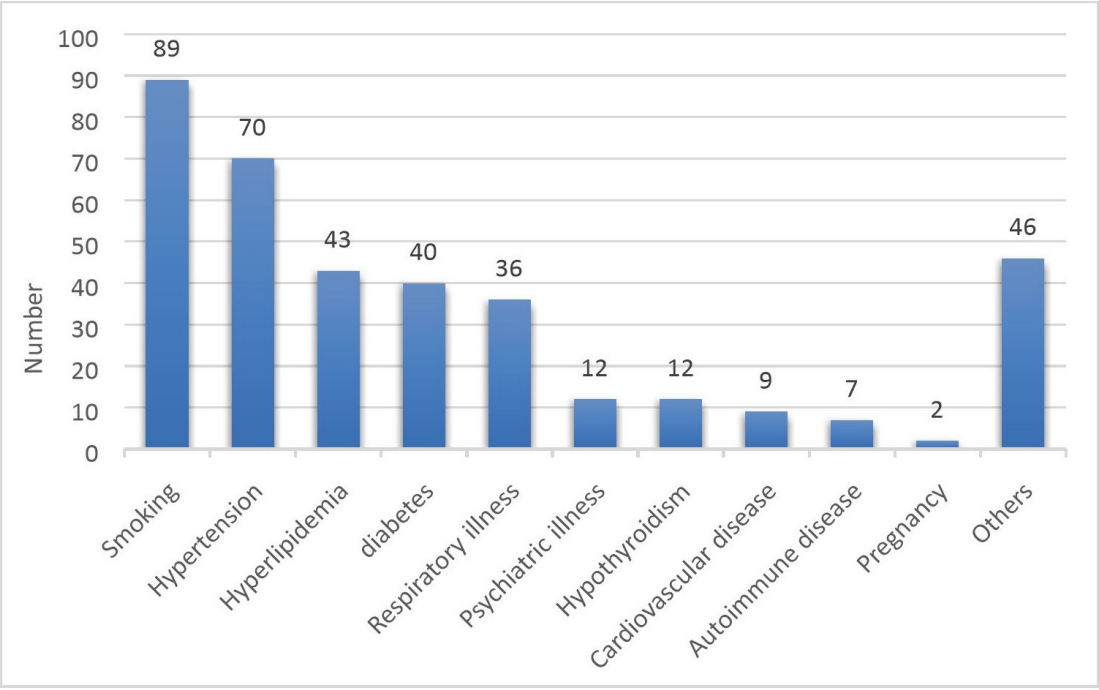


Figure 1: Prevalence of smoking and underlying medical conditions among the respondents to the survey.

Table 2: Descriptive statistics for the characteristics and associations with anxiety, and depression in the participants.

Variables	participants		Anxiety (using GAD-2)		Depression (using PHQ-2)		Anxiety and depression (using PHQ-4)	
	N	%	%	*P*	%	*P*	%	*P*
Total	607	100	63		53		54	
Age, mean (SD)	38.4(9.9)		36.3(8)		36.1(8.5)		35.6 (7.6)	
Age group (years)				<0.001		<0.001		<0.001
25 and below	17	2.8	70.6		82.4		76.5	
26-35	271	44.6	70.8		60.5		63.8	
36-45	193	31.8	67.9		53.4		54.4	
46-55	80	13.2	45		37.5		38.8	
56 or above	46	7.6	26.1		21.7		13	
Sex				< 0.001		0.143		< 0.001
Male	344	56.7	55.8		50.3		47.7	
Female	263	43.3	72.6		56.3		62.4	
Job grade				0.009		0.002		0.001
Junior (< 5years)	123	20.3	71.5		65.9		66.7	
Intermediate (5-9 years)	131	21.6	68.7		55		58.8	
Senior (≥ 10 years)	353	58.2	58.1		47.6		47.9	
Working position				0.273		0.283		0.671
Frontline (COVID team)	275	45.3	65.5		55.3		53.1	
Non-frontline	332	54.7	61.1		50.9		54.8	
Way of joining the team				0.021		0.008		0.002
Volunteered	56	20.4	55.4		48.2		41.1	
Nominated	188	68.4	65.4		54.8		52.7	
Forced against their well	13	4.7	100		100		100	
Others (places assigned for COVID service by default)	18	6.5	72.2		50		55.1	
IPAC/PPE training before joining				0.005		0.004		<0.001
No training	65	23.6	80		70.8		72.3	
Received training	210	76.4	61		50.5		47.1	

GAD-2: 2-item anxiety scale**; PHQ-2:** 2-item depression scale **; PHQ-4:** Patient health questionnaire-4**; SD:** standard deviation ; **COVID:** novel coronavirus disease; **IPAC:** infection prevention and control; **PPE:** personal protective equipment.

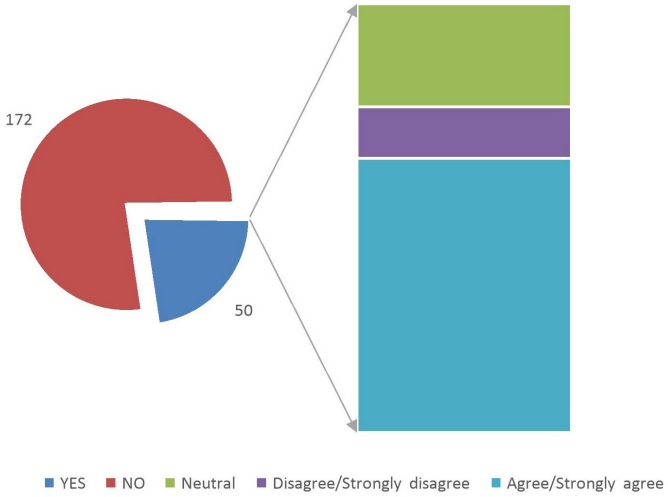


Figure 2: Opinions of HCWs reporting worsening of their medical condition.

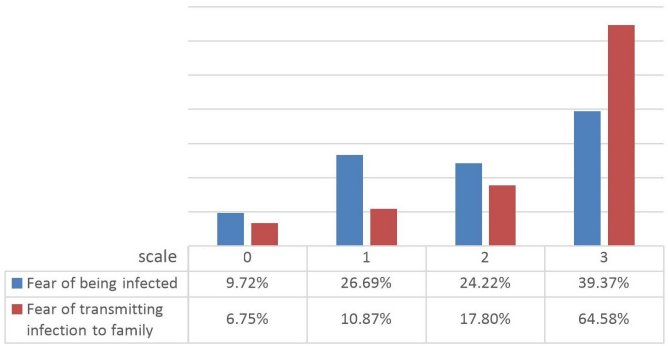
3 (2-5), respectively. A comparison of the PHQ-4 score showed no significant difference between COVID team members and non-members (p= 0.225). This also applies to GAD-2 score (p= 0.176), and PHQ-2 score (p= 0.332) among both groups.

Risk Factors of Mental Health Outcomes

Multivariable logistic regression analysis showed that, after controlling for confounders, being physician and young were associated with severe grade of anxiety and depression based on PHQ-4 grading system (severe anxiety and depression among younger age groups: OR, 2.53; 95% CI, 1.79-3.56; p <0.001, and physicians: OR, 2.55; 95% CI, 1.11-5.86; p = 0.027). Moreover, being young, female, and working as physician were associated with moderate grade of anxiety and depression after controlling for other confounders (moderate anxiety and depression among females: OR, 2.02; 95% CI, 1.14-3.56; p = 0.015, younger age groups: OR, 2.44; 95% CI, 1.74-3.42; p <0.001, and physicians OR, 3.21; 95 CI%, 1.36-7.58; p= 0.008).

Moreover, on a 4-point Likert scale, with 0 representing the lowest level of a perceived fear to 3 representing the highest level of perceived fear, we asked participants to grade their fears of getting COVID-19 infection or transmitting the infection to their families. About 39% of participants graded their fear of getting infected as 3 while almost 65% of them had great fears of transmitting the disease to their families (Figure 3). We found a significant correlation between the PHQ-4 score of HCWs and fear of being infected (r = 0.53, p <0.001) or transmitting the infection to their families (r = 0.49, p <0.001).

Thence, the possible reasons beyond HCW fears were explored. Severity and uncertainty about the disease, deficiency of PPE, and lack of training before joining COVID teams were among the reasons. Others express that noncompliance of patients to isolation instructions and lack of social distancing practice in the workplace represents the reason why they think there is an increased risk of infection (Figure 4).



scale	0	1	2	3
Fear of being infected	9.72%	26.69%	24.22%	39.37%
Fear of transmitting infection to family	6.75%	10.87%	17.80%	64.58%

Figure 3: Grades of subjective fear of getting infected or passing the infection to their families. Responses are graded as (0) Not at all, (1) less than half of days, (2) More than half of days, (3) Nearly everyday.

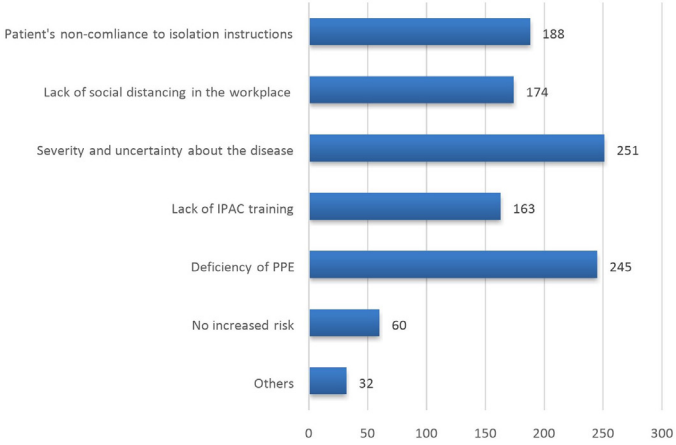


Figure 4: Reasons that may increase the risk of infection in their workplace according to participants.

Discussion

This cross-sectional survey revealed a high prevalence of mental health symptoms among HCWs during the COVID-19 pandemic in Kuwait. Using the PHQ-4 score, the estimated rate of anxiety and depression was 54% (26.9 % of HCWs had severe anxiety and depression). When subscores were used (GAD-2 and PHQ-2), 63% and 53% of all participants reported symptoms of anxiety and depression, respectively. The estimated rate of anxiety and depression among HCWs is higher than that of the primary health clinic attendees in Kuwait (depression 22.9% and anxiety 17.7%) [14]. This variation could be explained by the acute impact of the COVID-19 disaster and the overwhelming stress to the HCWs, whereas such threats were not found in the primary health clinic for patients attending only for screening at that time. This is confirmed by our finding that 80% of participants in the study believe that this anxiety and depression is related to the COVID-19 outbreak.

The high rate of psychiatric morbidity during the COVID-19 pandemic can be comparable with the consequences of another coronavirus, the severe acute respiratory syndrome (SARS), where studies showed high rates of anxiety and depression among HCWs (77.4% and 74.2%, respectively) [9]. A study in China revealed a high prevalence of depression (50.4%) and anxiety (44.6%) among HCWs treating COVID-19 patients [15]. A meta-analysis of data from Chine, where the virus first originated, including 13 studies from China and Singapore (total of 33062 HCWs) during the COVID-19 pandemic showed a pooled prevalence of anxiety and depression of 23.2% and 22.8%, respectively [7]. The experience acquired in the interim in these areas may explain the differences in rates of anxiety and depression among HCWs between China and Kuwait.

Female HCWs had a higher rate of anxiety and depression in our study when compared to male HCWs. This probably reflects the already established gender difference for anxiety and depression disorders [16,17].

Another finding in our study was that younger HCWs occupying junior grade jobs tend to show a higher prevalence of anxiety and depression. In general, medical staff are anxious and stressed due to many factors including being exposed to COVID-19 at work and fear of taking the infection home to their family, the expected shortage of PPE, the increasing flow of COVID-19 cases, fear of not having rapid access to testing if they develop COVID-19 symptoms, the long working hours, and the physical exhaustion [18]. However, young HCWs with junior titles, with fewer years of work experience, feel psychologically challenged when committing themselves to provide high-quality care for patients. Moreover, juniors have closer contact with patients so they may be more exposed to moral injury related to patients' suffering and death. In addition to these high psychological demands, competition between junior medical staff increases their anxiety and stress [19]. Support provided by senior medical staff and the respect shown by patients or their families helps to protect junior HCWs from mood disorders [20].

In our study younger age, working as physician and female gender are risk factors for moderate anxiety and depression after controlling for other confounders. While being physician and younger age group are risk factors for severe grade of anxiety and depression based on PHQ-4 grading system. Risk factors for psychiatric problems in HCWs identified in other studies include increased contact with infected patients, spending a prolonged time in quarantine, perceived social stigma directed towards HCWs, a prior history of psychiatric illnesses, and perceived lack of organizational support [21].

Contrary to our expectations, anxiety and depression rates were not significantly different between frontline and non-frontline medical staff. Other studies have shown that frontline HCWs have higher rates of depression, anxiety, insomnia, and distress [15]. In our study, there was no significant difference in PHQ-4 score or GAD-2 and PHQ-2 subscores between frontline workers and other HCWs.

Among frontline HCWs in our study, 20.4% Volunteered to join COVID teams, 68.4% were nominated by their seniors to join, 6.5% worked in places assigned to COVID service by default (but not against their well), while only 4.7% of HCWs reported being forced to join COVID teams against their well. Subgroup analysis showed that those who reported being forced to join frontline jobs against their well had a 100% prevalence of anxiety and depression symptoms (by all of GAD-2, PHQ-2, and PHQ-4 scores). Besides, HCWs who did not receive IPAC/PPE training before joining frontlines (23.6%) had a statistically significant higher rate of anxiety and depression symptoms (p value= 0.005, 0.004, <0.001 for GAD-2, PHQ-2, and PHQ-4, respectively). The correct use of PPE is necessary to decrease the burden of infected HCWs. Studies have shown that training

of HCWs exposed to highly infectious diseases on the use of PPE reduces errors of donning/doffing procedures and risk of contamination [21]. HCWs dealing with COVID-19 patients come from different medical specialty streams. Standard training in IPAC/PPE can reduce their anxiety and make them feel less stressed before joining the frontlines. Easy access to PPE and trust in the institution's infection control measures are associated with decreased risk of adverse psychological outcomes in HCWs [22].

In our study, the perceived fear of being infected was considered high among 39% of HCWs while concern about the transmission of infection to family was considered high among 65% of respondent medical staff. The majority of HCWs in the study (80%) believe that their anxiety and depression is related to the COVID-19 outbreak. We found a significant correlation between PHQ-4 score of HCWs and fear of being infected ($r = 0.53$, $p < 0.001$) or transmitting the infection to their families ($r = 0.49$, $p < 0.001$). However, the cross-sectional design of the study prevents us from answering questions about causality as people who are already distressed for reasons not measured in this study are more likely to be worried about the COVID-19 pandemic.

Similar results were reported during the H1N1 pandemic when the most frequent concern among HCWs was the infection of family and friends (54.9%) [8]. Providing adequate PPE and rapid access to evaluation and testing, if symptoms develop, reduce the risk of HCWs acquiring the infection or being a portal of transmission to family members [18].

Based on our results, we recommend some interventions to promote the mental well-being of HCWs exposed to COVID-19

- An immediate priority should be the collection of high-quality data about the psychological effects of the COVID-19 pandemic on HCWs.
- Proactive steps should be taken to minimize the detrimental psychological effects of the pandemic.
- Psychiatric interventions for HCWs should be incorporated into the COVID team to monitor symptoms of anxiety and depression and to provide timely support.
- More attention should be paid to female, younger, junior medical staff.
- Provide support to HCWs especially the juniors (e.g. educational guidelines, research updates, receiving clear communication from supervisors, adequate time off from work, provide the training that allows the provision of high-quality care to patients, and access to psychiatric interventions).
- HCWs should not be forced to work in frontlines against their well.
- All frontline HCWs must have IPAC/PPE training before starting their job and availability of PPE should be ensured.
- Rapid access to evaluation and testing if symptoms develop should be available.

A methodological limitation of our study lies in the unestimated response rate. Non-respondents may be either too stressed to respond or not at all stressed and therefore not interested in the survey. Another limitation is gathering information regarding anxiety or depression by self-reporting. These scores are a screening tool, and a positive screen should be followed by a clinical interview. However, this was not possible in our study due to the anonymity of the survey. Also, the characteristics of the study sample suggest that it is not accurately representative of the diversity of HCWs in Kuwait as the majority were physicians (74.8%) with fewer nurses represented in the sample (15.7%).

Nevertheless, there are several strengths in our study. To our knowledge, this is the first study to examine the prevalence of depression and anxiety on HCWs during the COVID-19 outbreak in Kuwait. Furthermore, our subgroup analysis based on gender, age, and the professional group provided additional valuable information on potential vulnerabilities. A positive note from the study is that the willingness of the medical staff to work during the COVID-19 pandemic has not been affected.

Conclusion

In conclusion, our study showed a high prevalence of anxiety and depression among HCWs in Kuwait which was related to worries about the COVID-19 pandemic. Young female HCWs showed a higher prevalence of anxiety and depression during this pandemic. Risk factors for severe anxiety and depression include being physician and younger age group, while risk factors for moderate anxiety and depression include younger age, working as physician and female gender. We found a significant correlation between PHQ-4 score of HCWs and the perceived fear of being infected or transmitting the infection to their families. Our findings can help improving medical staff support and enhance meeting their psychological needs under pandemic conditions. Our impression is that accepting the reality, taking steps to minimize the psychological effects of the pandemic, and attempting to grow from the situation will help to improve the mental health of HCWs.

Authors' contributions:

MHA: Conception and design of the study, designing the online survey, and writing of the original draft. OZA: Data collection, data preparation, editing and revision of the manuscript. MKA: Designing the online survey, data collection, data preparation, editing and revision of the manuscript. AHA: Data analysis, interpretation, and writing of the original draft. All authors have approved the final manuscript.

List of Abbreviations

CIs: Confidence Intervals; COVID-19: Novel Coronavirus Disease 2019; GAD-2: Generalized Anxiety Disorder–2 Scale; GAD–7: Generalized Anxiety Disorder–7 Scale; HCWs: Health Care Workers; IPAC: Infection Prevention and Control; IQR: Interquartile Range; ORs: Odds Ratios; PHQ-2: Patient Health Questionnaire-2; PHQ-4: Patient Health Questionnaire-4; PHQ-8: Patient Health Questionnaire-8; PPE: Personal Protective Equipment; SARS: Severe Acute Respiratory Syndrome; SD: standard deviation; SPSS: Statistical Package for the Social Sciences.

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