Psychosocial Determinants of Post-Traumatic Stress Disorder among Healthcare Workers in Saudi Arabia During the COVID-19 Pandemic

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ABSTRACT

Background: The COVID-19 pandemic has heightened psychological distress among healthcare workers (HCWs) globally, with post-traumatic stress disorder (PTSD) becoming increasingly prevalent. This study examines PTSD prevalence and psychosocial determinants among HCWs in Saudi Arabia, where they faced high-risk conditions during the pandemic.

Methods: A cross-sectional survey was conducted among 541 HCWs, assessing PTSD symptoms using the Post-Traumatic Stress Disorder Checklist for Civilians (PCL-C), along with The COVID-19 Fear Scale (FCV-19S), and The four-item Patient Health Questionnaire-4 (PHQ-4) for depression and anxiety screening. Statistical analyses were performed to identify correlations between PTSD symptoms, demographics, COVID-19 exposure, and mental health screening abovementioned scales.

Results: PTSD symptoms were reported by 16.8% of participants, with 18.3% and 18.5% experiencing anxiety and depression, respectively. PTSD symptoms were positively correlated with depression (r=0.719), anxiety (r=0.715), and COVID-19 fear (r=0.387) (p<0.001). Higher PTSD scores were more common among unmarried HCWs and those with infected relatives or friends. Regression analysis showed depression and anxiety as significant predictors of PTSD severity.

Conclusion: PTSD among Saudi HCWs during COVID-19 is notably linked to anxiety, depression, and COVID-19 fear, with additional risk for those unmarried or where loved individuals are affected by the virus. These findings underscore the urgent need for targeted mental health support to address PTSD risk factors and improve HCWs' well-being.

Keywords: 1; PTSD 2; COVID-19 3; Saudi 4; Healthcare Workers

INTRODUCTION

The COVID-19 pandemic has unleashed an unprecedented global health crisis, leaving an indelible mark on every facet of human life. Healthcare workers (HCWs), the valiant sentinels at the forefront of this battle, have borne the brunt of this relentless pandemic. While their unwavering dedication and expertise have been instrumental in saving countless lives, the psychological toll exacted on their mental health has been profound and far-reaching(1,2).

Amidst the surge of COVID-19 cases, HCWs have found themselves grappling with an unrelenting workload, often enduring extended work hours and prolonged shifts. This relentless demand has pushed them to their physical and psychological limits, fostering fatigue, burnout, and chronic stress(3). Moreover, the constant exposure to COVID-19 patients has placed HCWs at a heightened risk of contracting the virus, fueling anxieties about their own health and the safety of their loved ones(2,4). This fear is further exacerbated by the shortage of personal protective equipment (PPE), intensifying their sense of vulnerability(5).

Compounding these challenges are the ethical dilemmas and decision fatigue that HCWs face. In situations with limited resources, they may be forced to make difficult choices regarding prioritizing care decisions, that can weigh heavily on their conscience, leading to moral distress and mental fatigue(3,6). Further disrupting their well-being is the isolation imposed by lockdowns and social distancing measures, limiting their ability to connect with friends, family, and colleagues – the very support systems that are crucial for coping with such overwhelming circumstances(1,2).

The psychological burden on HCWs extends beyond the fear of personal safety. Bearing witness to the devastating effects of the virus, they often find themselves on the frontlines of death and suffering. Constant exposure to critical illness and loss can lead to feelings of helplessness, guilt, and emotional distress, leaving indelible scars on their psyche, and may even develop post-traumatic stress disorder (PTSD)(3,7).

The COVID-19 pandemic has also introduced an unprecedented level of ambiguity and uncertainty, as HCWs navigate the rapidly evolving nature of the virus, its mutations, and the efficacy of treatments and preventive measures(8). The lack of adequate training and support to deal with this unprecedented crisis has further exacerbated the psychological strain(6).

The far-reaching implications of the pandemic on HCWs extend beyond their personal well-being, impacting the quality of healthcare services they provide. Studies have consistently demonstrated a direct correlation between HCWs' mental well-being and their ability to deliver compassionate and effective care(9). The ongoing mental health crisis among HCWs threatens to compromise the quality of care for all patients.

According to several Systematic reviews, healthcare workers involved in the care of COVID-19 patients reported a prevalence of 19% to 42%

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for depression, 15% to 47% for anxiety, 26% to 49% for Insomnia, and 29.5% to 49% got burnout(1,10–12). Furthermore, post-traumatic stress disorder was reported at alarming rates as pooled studies in systematic reviews admitted a 15% to 39% PTSD prevalence rate(11,12). In Saudi Arabia, the prevalence of PTSD among HCWs during the COVID-19 pandemic was between 14.9% and 33.4%(13)(14). Some of the most important psychosocial determinants for PTSD among healthcare workers include exposure to COVID-19 patients and their suffering, working in high-risk settings (e.g., COVID-19 wards, intensive care units), working long hours, lack of personal protective equipment (PPE), fear of contracting COVID-19, witnessing death and suffering, lack of social support, pre-existing mental health conditions, such as anxiety or depression, female gender, and younger age(2,5,15,16).

In this study, I aim to study the prevalence and psychosocial determinant of PTSD among HCWs in Saudi Arabia as most of the published Saudi papers focus on the prevalence and do not explore association with other psychological variables sufficiently.

METHODS

Population and Sampling

The data of this paper was extracted from raw data from a previously published study(17), where a cross-sectional sample was conducted to assess the stress levels of healthcare professionals in Saudi Arabia amid the COVID-19 pandemic. An online survey was used for the assessments, and it was sent by email and WhatsApp groups to a convenient sample of healthcare professionals around the kingdom. At the start of the survey, all respondents received a plain-language informational statement describing the identity of the investigators, the goal of the study, the amount of time needed to complete the survey, and all the specifics about data preservation and confidentiality. The survey was voluntary and anonymous; after reading the provided consent, respondents were given the option to proceed with filling out the survey or not.

Additionally, before submitting the final form, they could edit their responses using the back button. From January to October 2021, Google Forms was used to gather the data. Three public health and mental health workers created the survey in English and Arabic which included already validated scales in both languages as some of the respondents may prefer to answer the survey written in their native Arabic language. Then, it was transformed into a Google Form and distributed to a sample of ten HCW workers to assess the clarity of the questions and for any comments or suggestions. By demanding that participants log in before beginning the survey, duplicate entries were prevented.

Following inquiries regarding sociodemographics, individuals were asked about their own, families, friends, patients, and their coworkers' histories of COVID-19 infection and death. The poll concluded this section by asking participants to answer the questions of the following three scales.

PCL-C: The DSM–IV Civilian Post-Traumatic Stress Disorder Checklist

The PCL-C is designed to assess symptoms of PTSD, in non-military individuals who have experienced events using self-reported surveys(18). It comprises a 17-item self-assessment scale mirroring the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM–IV) symptoms of PTSD. Participants use a Likert scale to rate the frequency and severity of their symptoms for each item provided in the assessment tool. The total scores, from all 17 items are calculated to establish the outcome. In terms, a higher total score indicates pronounced symptoms of PTSD. A score of 44 and above demonstrates high sensitivity (0.94) and specificity (0.86), in identifying PTSD during screening processes(19).

FCV-19S: The COVID-19 Fear Scale

The FCW-19S Survey was created to gauge the extent of fear and anxiety surrounding COVID-19. The survey is a unidimensional scale comprising seven statements that respondents rate using a Likert scale usually from 1 (disagree) to 5 (strongly agree). Both the initial English and Arabic versions of the FCV-19S have demonstrated high reliability and valid psychometric characteristics(20)(21).

PHQ-4: The Four-item Patient Health Questionnaire

The PHQ-4 consists of four items that assess depression and anxiety over the last two weeks and are used because of their feasibility and good validity and reliability in both English and Arabic languages. The first two items assess depression symptoms while the last two for anxiety ones. Each item assesses one major presentation of either depression or anxiety choosing one of four frequencies, not at all, some days, two for more than half of the days, and nearly every day. These options have values of zero to three. The respondent will have probable depression or anxiety if the summation of the first two items or the last ones scores three or more(22)(23).

Analytical Statistics

The statistical analysis was conducted using IBM SPSS Statistics for Windows, version 20 (Armonk, NY: IBM Corp). The analysis did not include cases where the survey contained missing values. The participants' sociodemographic distribution was examined and expressed as a percentage of the total. The three scales and the survey's overall internal consistency were measured using Cronbach's alpha. According to how many groups there were, a Mann-Whitney test or an ANOVA was used to compare the scores from the various sociodemographic categories. Pearson correlation between the means of the scale scores was considered. Also, linear regression was performed to quantify significant relationships.

RESULTS

According to the findings, participants' ages ranged from 30 to 61 years old, with the largest group, or 44.5% of the sample, being between the ages of 31 and 40. Of the participants, 52.3 percent worked in a hospital environment. About 75% of the sample consisted of men, and the bulk of participants (67.5%) were from Saudi Arabia's southern region, while the least number (4.4%) were from the northern region. Saudi nationals made up 71% of all respondents, making up most of the sample. 32.2% and 25.1% of the participants were physicians and nurses, respectively. It was also observed that 29.4% of the population had previously contracted the coronavirus during the pandemic, and 21.3% of the population was receiving treatment for chronic illnesses. About 64% of those surveyed had relatives or close friends who had contracted the coronavirus, compared to 26.8% who had close friends or relatives who had passed away from the illness. Furthermore, just over fifteen percent of the surveyed HCWs had a history of coronavirus-related patient deaths, but 34.6% of participants had lost coworkers to the virus (Table 1).

PCL-C Cronbach's alpha for internal consistency was 0.976, and through a Spearman correlation analysis, the inter-item correlation

and the item-total correlation were (0.596 - 0.846) and (0.788 - 0.883), respectively. According to the PCL-C scale, it showed a PTSD prevalence of 16.8% at 44cutoff point scores. FCV-19S has good internal consistency with Cronbach's alpha 0.733. PHQ-4 Cronbach's alpha scores were 0.913 for depression items and 0.884 for anxiety. Addressing three as cutoff scores for each of the depression and anxiety, the prevalences of depression and anxiety were 18.48% and 18.30%, respectively. Study data collection survey Cronbach's alpha was 0.815.

Various significant positive relations were identified between the total scores of different scales. The strongest significant relation elaborated between PHQ-4-Depression items and PCL-C with r=0.719 and p<0.001. Table 2 presents significant correlations with their coefficients. In addition, increasing PHQ-4-Depression items scores lead to a significant 2.807 increase in the probability of a high post-traumatic stress score (p=0.002).

Table 1 compares PCL-C (Posttraumatic Stress Disorder Checklist) scores across different sociodemographic groups, utilizing Mann-Whitney or ANOVA statistical tests to determine significance. A significant difference is observed between married (mean = 21.57) and unmarried individuals (mean = 28.68). Unmarried individuals report higher PCL-C scores, suggesting a potential vulnerability in this group. Another significant difference (p = 0.013) is found for those with a history of close relatives or friends infected with COVID-19 (mean = 24.97).

Table 1. Sociodemographic distribution (No. = 541)

Parameter	No.	Percent
Age		
1. 30 or less	128	23.7%
2. 31 – 40 Year	241	44.5%
3. 41 – 50 Year	120	22.2%
4. 51 – 60 Year	44	8.1%
5. 61 or more	8	1.5%
Gender		
1. Male	348	64.3%
2. Female	193	35.7%
Nationality		
1. Saudi	384	71.0%
2. Non-Saudi	157	29.0%
Marital status		
1. Married	406	75.0%
2. Non-married	135	25.0%
Physician	175	32.3%
1. Nurse	136	25.1%
2. Dentist	56	10.4%
3. Pharmacist	45	8.3%
4. Admin	23	4.3%
5. Psychologist	6	1.1%
6. Social worker	8	1.5%
7. Therapist (rehabilitation and physiotherapy)	2	0.4%
8. Paramedic	12	2.2%
9. Other	78	14.4%
Work place		
1. PHC	171	31.6%
2. Hospital	283	52.3%
3. Other	87	16.1%
Working hours/week		
1. < 20 hours	31	5.7%
2. 20 - <30 hours	68	12.6%
3. 30 - <40 hours	217	40.1%
4. ≥ 40 hours	225	41.6%
Region		
1. Northern	24	4.4%
2. Southern	365	67.5%
3. Eastern	28	5.2%
4. Western	48	8.9%
5. Middle	76	14.0%
Chronic diseases		
1. Yes	115	21.3%
2. No	426	78.7%
COVID-19		
1. Yes	159	29.4%
2. No	382	70.6%
Family member or close friend with COVID-19		
1. Yes	344	63.6%
2. No	197	36.4%
Death of family member or close friend due to COVID-19		
1. Yes	145	26.8%
2. No	396	73.2%
1. Death of colleague due to COVID-19		
2. Yes	187	34.6%
3. No	354	65.4%
Death of your patient due to COVID-19		
1. Yes	84	15.5%
2. No	457	84.5%

Table 2: Spearman's correlations and linear regressions correlations between PCL-C, PHQ-4-Depession items, PHQ-4-Anxiety items, depression, and **FCV-19S** (Number: 541)

Table 2. Post-traumatic stress

Parameters	Post-traumatic stress					
	A. Spearman's correlation			B. Linear regression		
	Coeff	P value	Sig	Coeff	P value	Sig
Anxiety	0.715	<0.001	**	1.720	0.002	**
Depression	0.719	<0.001	**	2.807	<0.0001	**
Fear	0.387	<0.001	**	2.007	0.005	**

**. Correlation and regression are significant at the 0.01 level
Post-traumatic stress is the dependent variable in regression.

Table 3: Means and standard deviations of PCL-C scores among different sociodemographic groups. Significance was assessed by Mann-Whitney or ANOVA tests according to the number of groups. Significance was considered at p <0.05.

DISCUSSION

These results display obvious insights into the prevalence and psychosocial determinates of PTSD among healthcare workers in Saudi Arabia amid the COVID-19 pandemic. A prevalence rate of 16.8% for PTSD reflects one aspect of the severe extensive psychological impact on the frontline workers' mental health. Although the value is within the national (14.9% - 33.4%) and international (15- 39) prevalence range(11,13,14), however, it tends to be lower than the prevalence rate in most of the studies which can be attributed mostly to the selected stringent scale diagnostic cutoff scores. Additionally, PTSD prevalence variations between studies are the general rule which might be attributed to differences in study design including the used diagnostic tools and the selected cutoff scores, sample populations, or timing during the pandemic. Moreover, depression, and anxiety measured by PHQ-4 showed strong associations with PTSD measured by DSM-IV

Table 3. PCL-C scores among different sociodemographic groups

Parameter	MEAN	SD	P.value	Parameter	MEAN	SD	P.value
Age				**Job**			
30 or younger	25.91	18.771	0.396	Physician	20.33	16.527	0.442
31–40 years	22.97	17.944		Nurse	19.72	18.934	
41–50 years	22.01	16.924		Dentist	31.23	17.049	
51–60 years	18.75	14.197		Pharmacist	16.78	15.858	
61 or older	28.00	13.589		Admin	30.44	21.971	
Gender				Psychologist	17.00	18.385	
Male	23.16	17.727	0.655	Social worker	17.25	13.426	
Female	24.00	17.933		Therapist	18.50	10.050	
Marital status				Paramedic	28.22	16.984	
Married	21.57	16.698	0.003	Other	20.33	16.527	
Unmarried	28.68	19.682		**History of chronic disease**			
Current workplace				Yes	24.76	18.807	0.570
PHC	22.46	18.325	0.208	No	23.10	17.538	
Hospital	22.75	17.163		**History of Coronavirus infection**			
Other	26.77	17.187		Yes	21.16	17.254	0.126
Work hours per week				No	24.20	17.910	
< 20 hours	28.08	16.030	0.189	**History of close relatives or friends infected with Coronavirus**			
20–29 hours	26.75	17.025		Yes	24.97	17.914	0.013
30–39 hours	19.45	16.282		No	20.42	17.162	
> 40 hours	24.09	18.715		**History of close relatives or friends' deaths from Coronavirus**			
Nationality				Yes	22.68	15.296	0.897
Saudi	24.10	18.311	0.382	No	23.67	18.599	
Non-Saudi	21.60	16.208		**History of colleagues' death from Coronavirus**			
Workplace region				Yes	23.08	15.629	0.683
Northern	22.89	14.708	0.057	No	23.59	18.839	
Southern	22.36	18.439		**History of patients' death from Coronavirus**			
Eastern	15.26	12.310		Yes	26.24	18.905	0.196
Western	30.92	18.041		No	22.75	17.463	
Middle	25.60	15.542					

PCL-C. These correlations are in alignment with existing literature. Xie et al. emphasized the impact of anxiety and depression on HCWs' mental health, suggesting that these coexisting symptoms exacerbate PTSD risk(24). These correlations imply that HCWs experiencing high anxiety and depressive symptoms are more likely to suffer from PTSD. In addition, fear of contracting COVID-19 which was measured by FCV-19S showed remarkable association with PTSD symptoms. Previous studies that investigated the correlation between fear of contracting COVID-19 and PTSD address this relationship(25,26).

Unmarried HCWs as a risk factor for PTSD were replicated in the results which may implicate the perception of social isolation and lack of social support which increase vulnerability as studied in some previous studies(14,15). Furthermore, those with familial or friendship experience of COVID-19 showing increased vulnerability which may emphasize how the overconcerns of the health of loved ones have an impact on the HCWs' perception of the pandemic as addressed in some other studies(26).

Notably, our data address no differences between job types toward PTSD vulnerability which may draw attention to not limiting the concerns to the physicians, emergency workers, and nurses. Additionally, as in most of the Saudi studies, gender differences did not significantly affect PTSD scores, suggesting that psychological distress from COVID-19 may transcend gender-specific responses(2,13,14,27). However, some other prior international studies have indicated that females often report higher PTSD levels in trauma-related conditions(1,26,28,29). This finding could imply a need for further investigation into gender-specific responses to stressors in pandemic contexts.

CONCLUSION

This research adds to our knowledge of how COVID-19 has affected the well-being of healthcare workers, in Saudi Arabia by showing a prevalence of PTSD and emphasizing the role of the fear of COVID-19, beloved individuals contracting infection, depression, anxiety level as well as the role of marital status. Addressing PTSD among healthcare workers is crucial to improve their mental well-being, minimize their suffering, and limit its disabling consequences which surely reflects on the kind of care they provide their patients.

Limitations: This study has constraints that could impact the applicability and precision of the results. It is a cross-sectional study that shows an association rather than causality. In addition, it used a conventional sample which affects the validity of the sample to represent the real population. Furthermore, although validated scales

were employed, they were created for applications rather than tailored to pandemic situations.

The research could overcome these constraints by using long-term plans with a range of participants that could improve the accuracy of the results.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

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