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Original Article

Mental Health Disorders among Healthcare Workers Exposed to COVID-19 Patients in Saudi Arabia

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Abstract

Background: Since the outbreak of Covid-19, several studies have demonstrated that healthcare workers (HCWs) are at risk of developing mental health disorders.
Objective: To survey Saudi healthcare workers exposed to Covid-19 patients for most commonly reported mental health disorders.
Study type, settings & duration: A descriptive cross-sectional study carried out at King Fahd Armed Forces Hospital Jeddah, Kingdom of Saudi Arabia (KSA) during June 2020.
Methodology: The population comprised of healthcare workers (physicians, nurses and paramedical staff). The mental health disorders explored were depression, anxiety, insomnia and post traumatic stress disorder (PTSD). Data analysis was performed using SPSS statistical software version 22.0 (IBM Corp).
Results: The most frequent mental health disorder reported in the present study was anxiety (68.6%) followed by insomnia (30.3%), PTSD (15.7%) and clinically significant depression (11.1%). Frontline healthcare workers demonstrated significantly higher risk of developing anxiety and PTSD after adjustment for other factors (OR of 1.9, 95% CI: 1.13-3.15, *p* =0.015), and (OR of 2.7, 95% CI: 1.22-6.01, *p* =0.014) respectively.
Conclusion: Frontline HCWs demonstrated approximately two-fold increased risk of developing anxiety and approximately three-fold risk of developing post-traumatic stress disorders after adjustment for other variables. We suggest launching a large scale health education program and screening for Saudi HCWs engaged in the management of Covid-19 patients.
Key words: Anxiety, Covid-19, depression, healthcare workers, insomnia, mental health disorders, post traumatic stress disorder.

Introduction

In December 2019, an outbreak of acute respiratory illness was reported in China and the causative organism was a new strain of coronavirus, labeled as severe acute respiratory syndrome coronavirus 2 (SARS-CoV2). The disease appeared as a number of cases diagnosed as pneumonia in the city of Wuhan, which spread quite in the form of an epidemic throughout China. Similar cases appeared in other parts of the globe and the World Health Organization declared the disease as a pandemic and labeled it as coronavirus disease 2019 (Covid-19.[1] As of August 1, 2020, over seventeen million confirmed cases of Covid-19 have been reported along with more than six hundred thousand deaths in more than 200 countries.[2] All the countries around the world are struggling with a continuous and rapid spread of disease and responding with appropriate treatment and preventive measures.[3,4] Kingdom of Saudi Arabia (KSA) has responded accordingly by implementing

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Authors Contribution

MSEK conceptualized the project did the literature search & statistical analysis. AB, HK, MSN, HQ, LA, MM & GA did the data collection. MSEK, NR, RA, MK, AR & SS did the drafting, revision & writing of manuscript.

strict preventive measures across the kingdom, by establishing dedicated treatment facilities and by swiftly launching a program to explore the genetics behind the virus in order to develop a vaccine for its cure. Healthcare workers (HCWs) are the frontline warriors in the war against this deadly pandemic. They are at higher risk of contracting the infection and could spread it to their families and relatives as well. Moreover, it is becoming extremely difficult for them to adapt to the work situation, which is quite unprecedented due to the rapid propagation of the disease resulting in hefty workload and hectic duty hours. These factors may lead to psychological and stress disorders among HCWs, which need to be identified and addressed urgently in order to strengthen them psychologically. Several studies from other countries have reported a remarkable prevalence of these disorders among the HCWs.[5-8] Nonetheless, to the best of our knowledge, we could not find any such published study addressing the issue among Saudi HCWs. Present study was designed to determine the effects of Covid-19 on mental health status of Saudi HCWs by conducting a survey using already established questionnaires. We surveyed for most commonly reported mental disorders among healthcare workers exposed to Covid-19 like depression, anxiety, insomnia and post-traumatic stress disorders (PTSD).

Methodology

It was a descriptive cross-sectional study carried out at King Fahd Armed Forces Hospital Jeddah KSA. Data was collected during the period of 01-30 June 2020. The study population comprised of healthcare workers (physicians, nurses and paramedical staff). The healthcare workers were further categorized according to their level of exposure to Covid-19 patients, i.e, the front line workers (those who are directly engaged in clinical activities of diagnosing, treating, or providing nursing care to confirmed Covid-19 patients) and the second line workers (those who are not directly engaged in clinical activities with confirmed Covid-19 patients, but are working in other units of the hospital). The sample size was estimated taking alpha (α) margin of error as level of significance at 0.05. A previous study reported a proportion of 35% of mental health disorders among healthcare workers.(5) The final sample size was: n=350 healthcare professionals for the present study. The respondents were approached randomly by co-investigators who were working as residents/trainees (all medical doctors) at the same hospital. The purpose of the study was explained to each respondent that data collection would be purely for research and publication purpose in order to enhance our understanding about the disease and to share our experience with the international community. They were also explained that there were 4 sets of questionnaires (both in Arabic and English version), which they had to fill it preferably in 30 minutes. They were further assured that information provided shall be kept in confidential at all stages up to the final publication of the results and all the respondents shall be informed after the study is published to share the findings and the inference drawn. After a thorough explanation a verbal consent was obtained from each respondent. Each co-investigator was assigned to cover a particular department of the hospital. Duplication was avoided by capturing the name, designation and employee number of each respondent on the annexure accompanying the questionnaires. The data were finally consolidated by the Principal investigator. The mental health disorders, we took into consideration were depression, anxiety, insomnia and post-traumatic stress disorder (PTSD). Depression was diagnosed using Patient Health Questionnaire-9 (PHQ-9), a nine-item module with a score ranging from 0 to 27. A score of ≥10 indicates clinically significant depression (Mild: a score ranges from 10–14, Moderate: 15–19, and Severe: a score of ≥20). Anxiety was diagnosed using 7-item questionnaire, the GAD-7. Scores of 5, 10, and 15 were taken as the cut-off points for mild, moderate and severe anxiety, respectively. Insomnia was diagnosed using Insomnia Severity Index (ISI), a 7-item self-report questionnaire (yielding a total score ranging from 0 to 28) assessing the nature, severity, and impact of insomnia. The total score interpreted as: (0–7) absence of insomnia; (8–14) sub-threshold insomnia; (15–21) moderate insomnia; and (22–28) severe insomnia. PTSD was diagnosed using 22-item Impact of Event Scale- Revised (IES-R) scale. The total score interpreted as: (24-32) PTSD is a clinical concern, (33-38) probable diagnosis of PTSD, (39 and above) as marked PTSD. Data analysis was performed using SPSS statistical software version 22.0 (IBM Corp.). The numeric data were presented as mean and SD and ranked/catogorical data as frequency and percentages. We applied binary logistic regression analysis for estimation of adjusted odds ratios (OR) and confidence intervals (CI) of different variables and their independent influence on mental health disorders. The significance level was set at $p \leq 0.05$.

The ethical approval was taken from Research Ethics Committee (REC) of King Fahd Armed Forces Hospital, Jeddah, KSA.

Results

Mean age of study participants was 32.5 years ± 6.2 days. Other demographic information is tabulated in Table-1.

Table 1: Demographic information.

AGE (Mean years ± SD days)	*32.5±6.2*
Age groups	n (%)
20-30 years	158 (45.1)
31-40 years	150 (42.9)
41-50 years	42 (12.0)
GENDER	
Male	118 (33.7)
Female	232 (63.3)
Marital status	
Single	172 (49.1)
Married	167 (47.7)
Widow	4 (1.1)
Divorced	7 (2.0)
Residential status	
Urban	314 (89.7)
Rural	36 (10.3)
Healthcare workers category	
Physicians	91 (26.0)
Nurses	207 (59.1)
Paramedical staff	52 (14.9)
Healthcare workers status	
Front line	237 (67.7)
Second line	113 (32.3)

The prevalence of mental health disorders of varying degree of severities is mentioned in Table-2. The most frequent mental health disorder reported in the present study was anxiety (68.6%) followed by insomnia (30.3%), PTSD (15.7%) and clinically significant depression (11.1%). Frontline healthcare workers demonstrated approximately two-fold increased risk of having anxiety after adjustment for other factors (OR of 1.9, 95% CI: 1.13-3.15, *p =0.015*, Table-3). Similarly, risk of developing PTSD was significantly higher (approximately 3-fold) among frontline healthcare workers after adjustment for other factors (OR of 2.7, 95% CI: 1.22-6.01, *p =0.014*, table 4). We could not find independent influence of any single variable on prevalence of depression and insomnia among study participants after adjustment for other variables (*p >0.05* in all cases, Table-3).

Table 2: Prevalence of mental health disorders in the study population.

Depression	*n (%)*
None	311 (88.9)
Mild	21 (6.0)
Moderate	15 (4.2)
Severe	3 (0.9)
Anxiety n (%)	
None	110 (31.4)
Mild	142 (40.6)
Moderate	63 (18.0)
Severe	35 (10.0)
Insomnia n (%)	
None	244 (69.7)
Sub threshold	83 (23.7)
Moderate	18 (5.2)
Severe	5 (1.4)
PTSD n (%)	
None	295 (84.3)
PTSD of clinical concern	19 (8.3)
Probable PTSD	7 (2.0)
Marked	9 (5.4)

Discussion

Researches in the past have demonstrated that during pandemics and epidemics, people developed anxiety and stress disorders along with fear of falling ill, which was irrespective of whether they got exposed or infected.(9) Depression, panic attacks, PTSD and anxiety were the major mental health disorders reported and in some cases, psychosis and even suicidal attempts were observed.[10,11]

In the present study, 63.3% participants were females. This is due to the fact that majority of study participants were nurses who, generally, are females in KSA. Nursing staff usually spend more time with the patients and hence are at greater risk of exposure. The most frequent mental health disorder reported in the present study was anxiety (68.6%) followed by insomnia (30.3%), PTSD (15.7%) and clinically significant depression (11.1%). Frontline healthcare workers demonstrated significantly higher risk of developing anxiety and PTSD after adjustment for other factors (OR of 1.9, 95% CI: 1.13-3.15, *p* =0.015), and (OR of 2.7, 95% CI: 1.22-6.01, *p* =0.014) respectively. As regard the current pandemic, the largest pieces of evidence on

Table 3: Results of binary logistic regression analysis showing odds ratios and confidence intervals for studied variables for studied mental health disorders.

Mental Health Disorder	*Variables*	*B*	*S.E.*	*Wald*	*df*	*Sig.*	*Exp(B) 'OR'*	*95% C.I. for EXP(B)*	
								Lower	*Upper*
Depression	Gender	0.561	0.382	2.157	1	0.142	1.752	.829	3.705
	Age Groups	-0.017	0.269	0.004	1	0.951	0.984	.581	1.665
	Marital Status	0.439	0.282	2.418	1	0.120	1.551	.892	2.696
	Worker Category	0.224	0.288	0.606	1	0.436	1.252	.711	2.202
	Worker Status	0.405	0.426	0.905	1	0.341	1.499	.651	3.453
	Residential Status	-19.17	6596.9	0.000	1	0.998	0.289	0.097	0.360
Anxiety	Gender	-0.138	0.268	0.267	1	0.605	0.871	0.515	1.472
	Age Groups	0.328	0.189	3.029	1	0.082	1.389	0.959	2.010
	Marital Status	0.374	0.217	2.954	1	0.086	1.453	0.949	2.224
	Worker Category	0.243	0.200	1.477	1	0.224	1.275	0.861	1.888
	Worker Status	0.636	0.261	5.953	1	0.015	1.889	1.133	3.148
	Residential Status	-0.476	0.383	1.547	1	0.214	0.621	0.293	1.316
Insomnia	Gender	0.220	0.266	0.684	1	0.408	1.246	0.739	2.101
	Age Groups	0.180	0.191	0.892	1	0.345	1.197	0.824	1.740
	Marital Status	0.374	0.204	3.340	1	0.068	1.453	0.973	2.169
	Worker Category	0.327	0.203	2.609	1	0.106	1.387	0.933	2.064
	Worker Status	0.015	0.271	0.003	1	0.956	1.015	0.597	1.725
	Residential Status	-1.240	0.556	4.980	1	0.126	0.289	0.097	0.860
PTSD	Gender	0.090	0.326	0.077	1	0.782	1.094	0.578	2.072
	Age Groups	0.329	0.246	1.795	1	0.180	1.390	0.859	2.249
	Marital Status	0.479	0.243	3.880	1	0.049	1.614	1.002	2.598
	Worker Category	0.034	0.257	0.017	1	0.896	1.034	0.625	1.711
	Worker Status	0.997	0.406	6.048	1	0.014	2.711	1.224	6.002
	Residential Status	0.155	0.470	0.109	1	0.742	1.168	.465	2.935

mental health disorders among HCWs came out from two recent systematic reviews.[12,13] In one review, Pappa S et al analyzed the data of 33,062 participants from 13 studies reporting the prevalence of depression, anxiety or insomnia among HCWs. A wide variation in reported pooled prevalence was observed, which may be attributed to the different cut-off scores and scales adopted. They reported pooled prevalence for depression as 22·8%, for anxiety as 23.2% and for insomnia 34.3%. However, majority of healthcare workers experienced anxiety and depression of mild severity.[12] These results are similar to our study results, as we also came across mild degree of anxiety, depression, insomnia and PTSD in majority of participants. Further sub-analysis of our study results and the meta-analysis by Pappa S et al, revealed that due to the fact nursing staff are frontline workers, they demonstrated higher prevalence of depression and anxiety. In another review, Spoorthy M et al included six published articles on different socio-demographic and psychological variables and their association with mental health disorders in HCWs who were directly engaged in management of Covid-19 patients. Mean age of participants was in the range of 26-40 years and majority of them were females (65-85%). Similar to present study results, Spoorthy M et al highlighted that frontline HCWs reported more severe symptoms that were associated significantly with the degree of contact with suspected or confirmed cases. Greater proportion of nurses compared to doctors demonstrated depression and anxiety. Spoorthy M et al further demonstrated that after social support was provided to HCWs, reduced level of stress and anxiety was observed along with enhanced levels of self-resilience. The most important factor, which could reduce the level of stress among HCW was sense of safety of their families. Another factor that was instrumental in stress reduction was guidance of senior staff members about safe practices and corrective measures along with their encouraging attitude.[13] Similarly, a study conducted at Wuhan, China

demonstrated that even for mild degree of symptoms, mental health support was essential in HCWs.[14]

There are number of other studies demonstrating that Covid-19 is associated with multiple psychiatric problems among healthcare workers who were engaged, directly or indirectly with the care of Covid-19 patients.[5-8] A study from China on hospital-based physicians and nurses (total n >1200), demonstrated prevalence of anxiety (12%), depression (15%), insomnia (8%) and traumatic distress (35%).[5] It was further demonstrated that symptoms were most likely to appear in HCWS who were directly engaged in the care of patients (e.g. nurses, most them were females). Another study from Singapore assessed nearly 300 hospital-based physicians and nurses caring for patients with Covid-19.[7] The authors reported lesser proportion of mental disorders when compared with Chinese study,[5] and attributed it to better preparedness of the healthcare workers in Singapore as they had a past experience with severe acute respiratory system (SARS) epidemic in 2003. A study from Pakistan explored the impact of Covid-19 pandemic among 290 HCWs. The healthcare workers complained of substantial impact on their social and mental health and attributed it to the current workload in overstretched healthcare facilities. Risk factors for psychiatric problems among healthcare workers was their direct engagement with Covid-19 infected patients.[8]

Several authors have explored anxiety and depression levels among HCWs in Saudi Arabia during Covid-19 outbreak with comparable results.[15-17] AlAteeqa DA et al reported 55.2% prevalence of depressive disorder and 51.4% prevalence of anxiety disorder. They further demonstrated that nurses had significantly higher mean score of anxiety (p <0.026).[15] Alenazia et al reported that 32.3% of HCWs demonstrated high levels of anxiety and those HCWs were more likely to be unmarried (OR = 1.32, 95% CI: 1.14–1.52) and nurses (OR = 1.54, 95% 1.24–1.91).[16] In the Eastern Province of Stadia Arabia, Alzaid EH et al reported that almost one-third of HCW were demonstrated anxiety disorder. Being a female, living with family members, and having a family history of COVID-19 increased the risk for anxiety disorder.[17]

The general impression we got out of the present survey is that assumptions and speculations about the disease were high among the participants, which could be the reason for their mental health problems. We postulate that due to advancement in telecommunication technology leading to global connectivity, widespread sharing of information and extensive media coverage on Covid-19 may be causing enhanced concern levels among HCWs. Similar issues have been addressed in two studies.[18,19] One study demonstrated that compared to the outbreak of SARS, the media hype and flow of information is much more during current pandemic. Generally, the participants in the present survey were worried about the mode and rapidity of transmission of infection, lack of definitive treatment protocols or vaccination and above all the fear of taking infection to their families.[18] Relevant to our inference, an Indian study highlighted that certain worries and fears were prevalent among HCWs engaged in the management of COVID-19 patients. These were lack of knowledge about appropriate use of personal protective equipment, feeling them as potential source of infection spread to their families and fear of being isolated, quarantined and lack of medical insurance coverage. They further demonstrated that social support and motivation was needed to strengthen and boost the morale of healthcare workers. A proposed solution suggested was setting up of multidisciplinary teams for large scale screening of healthcare workers to address and manage mental health problems at an earlier stage.[20]

In summary, a significant proportion of Saudi healthcare workers (majority of them were frontline workers) demonstrated mental health disorders, though of a mild degree in most of the participants. This emphasizes the need of setting up of a mechanism of providing general social support and motivation to the Saudi HCWs, particularly for the frontline workers. Limiting the duty hours along with provision of proper rest areas at work places could reduce the stress level among them. We suggest relaxing of duty hours and paid leaves, where possible for the affected HCWs. Along with general moral and social support, the affected HCWs should be encouraged to consult the multidisciplinary teams comprising of experts in psychiatric illnesses for comprehensive management of their mental health issues. We also suggest to the public health authorities in the Kingdom to launch a large scale screening program for HCWs for mental health disorders. The screening program should include health education programs to enhance the psychological resilience of the HCWs. Media and other online teams can be of remarkable assistance in this regard, as demonstrated by other studies.[21,22] The current survey only encompasses a single healthcare facility at the Kingdom; we recommend multicenter studies with larger sample size as the working conditions may be different across different facilities in the Kingdom.

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