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Original Research Article

Prevalence of Depression, Anxiety and Insomnia among Healthcare Workers during the COVID-19

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Abstract

During the pandemic of covid-19, many physicians got anxiety, depression, and insomnia that affected their performance at work and daily life. According to the psychiatry department of Imperial College in London, they reported that it is necessary to assess the mental health of the health workers who were on the frontline during the COVID-19 pandemic and to evaluate the pattern of sleep and other issues that may affect their mental status. The aim of the study is to assess and analyze the existing evidence on the prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 outbreak. A cross-sectional study will be conducted in PSMMC, Riyadh. Assessing the psychosocial effect of COVID-19 among health care workers. sampling size and sampling procedure: 380 HCWs will be included in the estimated proportion of anxiety and depression. All doctors and nurses who met the criteria will be included in the study. Data collection form: Data will be utilized by conducting an online survey to decrease the risk of spreading infection through papers. The following variables will be collected and entered into Microsoft Excel 2010 x demographics x Medical characteristics x Job title and location x The psychosocial effects. The characteristics of the study participants are shown in Table (1). The mean age of the participants was 31.81(±7.64) years, and more than half of the participants were males at 52.15%, and 61.9% were single. Most of the participants were doctors at 76.7%, the vast majority (97.9%) were working during COVID-19, and 94.9% managed suspected COVID-19 cases, with a 73.3% high exposure level. For depression, more than half (59.32%) of the participants reported a loss of interest or feeling low, 39.41% and 33.90% agreed that the COVID-19 pandemic affected their daily life routine including feeling locked down and loss of interest in fun activities. For anxiety, the majority of the respondents reported experiencing anxiety at 83.9%, and almost half of them reported stigma thoughts and somatization at 49.58%, and 50.42%, respectively. Almost half and even more than half of the participants agree that the COVID-19 pandemic affected their daily life routine. In regards to insomnia, 61.44% said that their sleep pattern was affectedCOVID-19D 19 Pandemic, 75.85% has their social life negatively affected, and 82.20% had their work performance modified to follow the standard operating procedure. Data is shown in Table (2). The mean score of anxiety by the characteristics of the participants is shown in Table (3). The mean of the total anxiety score was 16.77(±3.98). Females showed a significantly higher mean score of anxiety compared to males at 17.55(±3.82) vs. 16.16(±4.01), with a p-value of <0.001. The anxiety score was the highest among doctors at 16.38(±3.93), with a significant p-value (0.003). The anxiety score was also significantly higher among those who were working during the pandemic, managing suspected cases, and with a high level of exposure to COVID-19. The mean of the total depression score was 7.37(±2.69), and it differed significantly (p <0.05) by gender, marital status, number of children, job title, working during the pandemic, and exposure level. Females score was higher at 8.06(±2.48) whilethe males one was 6.73(±2.73). Nurses showed the highest depression score at 8.26(±2.63), and those with high exposure levels showed a higher score at 7.91(2.59) compared to moderate exposure at 5.89(±2.40). Data is shown in Table (4) For insomnia, the mean total score was 2.19(±1). It was also significantly higher among females at 2.36(0.96), and nurses at 2.44(±0.96). Similarly, those who worked during the pandemic, managed suspected cases, and were at high exposure levels showed significantly higher insomnia scores as shownTablee (5). This study explored the prevalence of anxiety, depression, and insomnia and their associated factors among COVID-19 HCWs in Saudi Arabia. The results highlighted that the prevalence of anxiety, depression, and insomnia are concerning, and considered far higher compared to what was reported globally in this regard.

Keywords: COVID-19, Depression, anxiety, PTSS. Google Scholar,PubMed, Elsevier, BMJ.

INTRODUCTION

In London up to April 17TH 2020, A systematic search of literature databases was conducted by Pappa S, Ntella V, et al. The two reviewers independently assessed full-text articles according to predefined criteria. The risk of bias for each individual study was assessed and data was pooled using random-effects meta-analyses to estimate the prevalence of specific mental health problems. Findings: Thirteen studies were included in the analysis with a combined total of 33,062 participants. Anxiety was assessed in 12 studies, with a pooled prevalence of 23·,2% and depression in 10 studies, with a prevalence rate of 22·8%. A subgroup analysis revealed gender and occupational differences with female HCPs and nurses exhibiting higher rates of affective symptoms compared to male and medical staff respectively. Finally, insomnia prevalence was estimated at 38·9% across 5 studies. Interpretation: Early evidence suggests that a considerable proportion of HCWs experience mood and sleep disturbances during this outbreak, stressing the need to establish ways to mitigate mental health risks and adjust interventions under pandemic conditions (Pappa et al., 2020). Another study was conducted in India and Singapore from February 19th till April 17th 2020 by Chew NWS et al. To assess the psychosocial effect by performing self-administered questionnaire. Included all health care workers, doctors, nurses allied health care workers, administrators, clerical staff maintenance. Questionnaire conducting demographic data, medical history symptoms of depression, anxiety for the past months on depression anxiety stress scale (Rezaei-Hachesu et al., 2022). In Iran mainly October 2020, there was a cross sectional study conducted by Zandifar A et al. In 9 general hospitals among health care workers including multistage sampling method. For assessing the PTSS during COVID -19 outbreak. Stigma perceptions was obtained from the questionnaire (Oteir et al., 2022) . In China mental health status was evaluated from February 7th till 14th 2020 by Huang JZ et al. By spreading cluster sampling among 246 medical staff. The study showed that the incidence of anxiety and stress disorder were high (Shamsan et al., 2022). In China mainly at the psychiatry department in April 2020. A survey using a selfadministered questionnaire online was conducted by Zhang C et al. Data collection was from 29th of January till 3rd of February 2020 in China. The study showed that more than one third of the medical staff were suffering from psychosocial issues during of COVID - 19 (Liu et al., 2020). In September 2020, A study was Conducted in Saudi Arabia by Alenazi et al. to assess the anxiety among health care workers during COVID-19. Cross sectional study. Showed that 68% of HCW developed anxiety. The aim is to offer urgent care for high risk people and to consider psychosocial support and to assess the updates among the pandemic (Xiao et al., 2020). In October 2020, a cross sectional study applied in Saudi Arabia by AlAteeq DA et al. During COVID-19 among health care workers to assess the development of depression and anxiety. The study showed there is obvious psychosocial impact among the HCW and therefore more attention to be considered to manage the issues (Kang et al., 2020). In Egypt mainly in April 2020, a study was conducted by Arafa A, Mohammed Z et al. By creating an online survey to access all HCW easily in Egypt and Saudi Arabia Hospitals. The duration was between April 14th till 24th 2020. The study included 426 HCW showed that 69% had depression, 58.9% had anxiety while 55.9% had stress and 37.3% had sleep depreciation (The Lancet Psychiatry, 2020). In Australia in October 2020, a systematic review was conducted by Cabarkapa S et al. The duration was back to 2002 till August 21st 2020. Assessing the risk of psychosocial impact during COVID-19. It showed the importance of mental health maintenance among the HCW during the pandemics. [9] An article was published in Italy in July 2020 by Di Tella M et al. A scale was used to assess the psychosocial effects among HCW during COVID-19. The participants were 145 HCW (doctors and nurses). The study showed that the number of the workers who covered COVID ward are at higher risk of PTSS as well as depression. [10]

During the pandemic of covid-19 this year many physicians got anxiety, depression and insomnia that affected their performance at work and daily life. According to psychiatry department of Imperial college in London they reported that it is necessary to assess the mental health of the health workers who were in the frontline during COVID-19 pandemic and to evaluate the pattern of sleep and other issues that may affect the mental status. The aim of the review is to assess and analyze the existing evidence on the prevalence of depression, anxiety and insomnia among health care workers during the COVID-19 outbreak.

METHODOLOGY

Study design

A cross sectional study will be conducted in PSMMC, Riyadh. Assessing the psychosocial effect of COVID-19 among health care workers.

1- target population: doctors and nurses who worked during the pandemic, At Prince Sultan Military Medical City (PSMMC) in Riyadh, Saudi Arabia.

2- sampling size and sampling procedure: 380 HCW will be included on estimated proportion of anxiety and depression 50% Sample size: N=(Z)2 p /(1-p)/d2 N= sample size Z= level of confidence according to the standard normal distribution P = estimated proportion of

Supplementary Table 1. Reliability for the items of the questionnaire

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Have you experienced Anxiety?	31.44	24.554	-.245	.679
Did your sleep pattern negatively affected?	31.22	24.590	-.213	.684
Did your social life negatively affected?	31.36	24.147	-.127	.675
Was your work performance modified to follow the standard operating procedures?	31.43	23.684	-.009	.665
Have you experienced loss of interest or feeling low?	31.20	24.296	-.153	.680
Have you experienced stigma thoughts ?	31.10	24.151	-.123	.678
Have you experienced somatization?	31.11	24.243	-.141	.679
Would you allow your children to go for playing in a shared playground?	30.84	22.329	.319	.641
Did COVID 19 Pandemic affected your daily life routine? [Going to gym]	28.89	17.179	.657	.563
Did COVID 19 Pandemic affected your daily life routine? [Jogging outdoor]	29.18	17.052	.578	.576
Did COVID 19 Pandemic affected your daily life routine? [Social gathering]	28.73	16.375	.753	.540
Did COVID 19 Pandemic affected your daily life routine? [Shopping]	28.92	16.632	.700	.551
Did COVID 19 Pandemic affected your daily life routine? [Feeling locked down]	29.14	17.814	.433	.610
Did COVID 19 Pandemic affected your daily life routine? [Loss of interest in fun activities]	29.30	17.810	.409	.616

3- the population that presents the characteristic D= tolerated margin error
4- sampling methods: All Doctors and Nurses who met the criteria will be included in the study.
4- inclusion / exclusion criteria: Inclusion: doctors and nurses 1- who worked during the pandemic COVID-19 at PSMMC m Riyadh. Exclusion: Medical Services Department for Armed Forces Scientific Research Center Research Ethics Committee 9 Submission Date: RESEARCH PROPOSAL (Non-Granted) 1-participants outside PSMMC, Riyadh.
5-data collection tool: Data collection tool will be through will self-administered questionnaire designed by authors Validation of questionnaire will be tested by process of face validation by group of 2 consultants After that, the validation will be more tested by processes of pilot study before reaching the final questionnaire design.
6- data collection form: Data will be utilized by conducting an online survey to decrease the risk of spreading infection through papers.
7- data management: The following variables will be collected and entered into Microsoft Excel 2010 x demographics x Medical characteristics x Job title and location x The psychosocial effects VIII.

Statistical analysis

Data were analyzed by using Statistical Package for Social Studies (SPSS 22; IBM Corp., New York, NY, USA). Continuous variables were expressed as mean ± standard deviation and categorical variables were expressed as percentages.

Kruskal-Wallis test and Mann-Whitney test were used for continuous variables without normal distribution. Shapiro-Wilk test was used to assess normality distribution for the variables. The Cronbach's alpha was used to assess the reliability of the questionnaire. A p-value <0.05 was considered statistically significant.

Reliability of the questionnaire

The Cronbach's alpha for the all items of the questionnaire, items of Depression, Anxiety, and Insomnia = 0.656, 0.804, 0.736, 0.654 respectively which reflect acceptable and good reliability.

RESULTS

The characteristics of the study participants are shown in Table (1). The mean age of the participants was 31.81(±7.64) years, and more than half of the participants were males at 52.15%, and 61.9% were single. Most of the participants were doctors at 76.7%, the vast majority (97.9%) was working during the COVID-19, and 94.9% managed suspected COVID-19 cases, with 73.3% high

Table 1. Characteristics of the participants (n=236)

		Number	%
Gender	Male	123	52.1
	Female	113	47.9
Age		31.81	7.64
Marital status	Single	146	61.9
	Married	82	34.7
	Divorced	8	3.4
Number of children:	No children	177	75.0
	1-2	41	17.4
	equals or more than 3	18	7.6
Job title	Doctor	181	76.7
	Nurse	54	22.9
	Other	1	.4
Have you been working during COVID 19 ?	Yes	231	97.9
	No	5	2.1
Did you manage suspected COVID 19 patients ?	Yes	224	94.9
	No	12	5.1
Level of exposure	Moderate	63	26.7
	High	173	73.3
Have you experienced Anxiety?	Yes	198	83.9
	No	38	16.1

Table 2. Answers about questions of Depression, Anxiety, and Insomnia

		Number	%
Depression			
Have you experienced loss of interest or feeling low?	Yes	140	59.32
	No	96	40.68
Did COVID 19 Pandemic affected your daily life routine? [Feeling locked down]	strongly disagree	20	8.47
	disagree	39	16.53
	neutral	36	15.25
	agree	93	39.41
	strongly agree	48	20.34
Did COVID 19 Pandemic affected your daily life routine? [Loss of interest in fun activities]	strongly disagree	22	9.32
	disagree	53	22.46
	neutral	36	15.25
	agree	80	33.90
	strongly agree	45	19.07
Anxiety			
Have you experienced Anxiety?	Yes	198	83.90
	No	38	16.10
Have you experienced stigma thoughts ?	Yes	117	49.58
	No	119	50.42
Have you experienced somatization?	Yes	119	50.42
	No	117	49.58
Would you allow your children to go for playing in a shared playground?	Yes	56	23.73
	No	180	76.27
Did COVID 19 Pandemic affected your daily life routine? [Going to gym]	strongly disagree	15	6.36
	disagree	15	6.36
	neutral	31	13.14
	agree	136	57.63
	strongly agree	39	16.53
Did COVID 19 Pandemic affected your daily life routine? [Jogging outdoor]	strongly disagree	23	9.75

Table 2. Continue

	disagree	27	11.44
	neutral	41	17.37
	agree	117	49.58
	strongly agree	28	11.86
Did COVID 19 Pandemic affected your daily life routine? [Social gathering]	strongly disagree	13	5.51
	disagree	16	6.78
	neutral	18	7.63
	agree	130	55.08
	strongly agree	59	25.00
Did COVID 19 Pandemic affected your daily life routine? [Shopping]	strongly disagree	15	6.36
	disagree	19	8.05
	neutral	34	14.41
	agree	126	53.39
	strongly agree	42	17.80
Insomnia			
Did your sleep pattern negatively affected?	Yes	145	61.44
	No	91	38.56
Did your social life negatively affected?	Yes	179	75.85
	No	57	24.15
Was your work performance modified to follow the standard operating procedures?	Yes	194	82.20
	No	42	17.80

Table 3. Mean score of Anxiety by the characteristics of the participants

		Mean	**SD**	**P value**
Gender	Male	16.06	4.01	<0.001*
	Female	17.55	3.82	
Marital status	Single	16.95	4.05	0.249
	Married	16.29	3.97	
	Divorced	18.38	2.13	
Number of children	No children	16.86	4.13	0.472
	1-2	16.46	3.72	
	≥ 3	16.56	3.17	
Job title	Doctor	16.38	3.95	0.003*
	Nurse	18.07	3.89	
	Other	18.00		
Have you been working during COVID 19?	Yes	16.86	3.93	0.027*
	No	12.80	4.76	
Did you manage suspected COVID 19 patients?	Yes	16.92	3.98	0.001*
	No	13.92	3.09	
Level of exposure	Moderate	14.63	3.68	<0.001*
	High	17.55	3.81	
Total score of Anxiety (out of 24)		16.77	3.98	
* Significant p value				
Likert scale was used with 5 points (Strongly disagree=1, Disagree=2, neutral=3, Agree=4, Strongly agree=5) for 4 questions of Anxiety, Likert scale was used with 2 points (no =0 , yes = 1) for 4 questions of the Anxiety with minimum score = 4 and maximum score = 24				

Table 4. Mean score of Depression by the characteristics of the participants

		Mean	SD	P value
Gender	Male	6.73	2.73	<0.001*
	Female	8.06	2.48	
Marital status	Single	7.76	2.67	0.001*
	Married	6.55	2.59	
	Divorced	8.63	2.07	
Number of children	No children	7.59	2.75	0.042*
	1-2	6.73	2.45	
	≥ 3	6.67	2.30	
Job title	Doctor	7.10	2.66	0.013*
	Nurse	8.26	2.63	
	Other	7.00		
Have you been working during COVID 19?	Yes	7.42	2.67	0.037*
	No	4.80	2.39	
Did you manage suspected COVID 19 patients?	Yes	7.44	2.70	0.052
	No	6.00	2.13	
Level of exposure	Moderate	5.89	2.40	<0.001*
	High	7.91	2.59	
Total score of Depression (out of 11)		7.37	2.69	

* Significant p value

Likert scale was used with 5 points (Strongly disagree=1, Disagree=2, neutral=3, Agree=4, Strongly agree=5) for2 questions of Depression, Likert scale was used with 2 points (no =0 , yes = 1) for one question of the Depression with minimum score = 2 and maximum score =11

Table 5. Mean score of Insomnia by the characteristics of the participants

		Mean	SD	P value
Gender	Male	2.04	1.02	0.005*
	Female	2.36	0.96	
Marital status	Single	2.23	1.03	0.007*
	Married	2.05	0.97	
	Divorced	3.00	0.00	
Number of children	No children	2.20	1.03	0.647
	1-2	2.22	0.94	
	≥ 3	2.06	0.94	
Job title	Doctor	2.12	1.01	0.040*
	Nurse	2.44	0.96	
	Other	2.00		
Have you been working during COVID 19?	Yes	2.23	0.98	0.002*
	No	0.60	0.89	
Did you manage suspected COVID 19 patients?	Yes	2.26	0.96	<0.001*
	No	1.00	1.13	
Level of exposure	Moderate	1.46	1.04	<0.001*
	High	2.46	0.85	
Total score of Insomnia (out of 3)		2.19	1.00	

* Significant p value

Likert scale was used with 2 points (no =0, yes = 1) for 3 questions of the Insomnia with minimum score = 0 and maximum score =3

exposure level.

For depression, more than half (59.32%) of the participants reported loss of interest or feeling low, 39.41% and 33.90% agreed that COVID 19 pandemic affected their daily life routine including feeling locked down and loss of interest in fun activities. For anxiety,

majority of the respondents reported experiencing anxiety at 83.9%, almost half of them reported stigma thoughts and somatization at 49.58%, and 50.42%, respectively. Almost half and even more than half of the participants agree that COVID-19 pandemic affected their daily life routine. In regards to insomnia, 61.44% said that their sleep pattern affected by COVID 19 Pandemic, 75.85% has their social life negatively affected, and 82.20% had their work performance modified to follow the standard operating procedure. Data is shown in table (2)

The mean score of anxiety by the characteristics of the participants is shown in table (3). The mean of the total anxiety score was 16.77(±3.98). Females showed a significantly higher mean score of anxiety compared to males at 17.55(±3.82) vs. 16.16(±4.01), with a p value of <0.001. The anxiety score was the highest among doctor at 16.38(±3.93), with a significant p value (0.003). The anxiety score was also significantly higher among those who were working during the pandemic, manage suspected cases, and with high level of exposure to COVID-19.

The mean of the total depression score was 7.37(±2.69), and it differed significantly ($p < 0.05$) by the gender, marital status, number of children, job title, working during the pandemic and exposure level. Females score was higher at 8.06(±2.48) while males one was 6.73(±2.73). Nurses showed the highest depression score at 8.26(±2.63), and those with high exposure level showed a higher score at 7.91(2.59) compared to moderate exposure at 5.89(±2.40). Data is shown in table (4)

For insomnia, the mean total score was 2.19(±1). It was also significantly higher among females at 2.36(0.96), nurses at 2.44(±0.96). Similarly, those who worked during the pandemic, managed suspected cases, and were at high exposure level showed significant higher insomnia score as shown in table (5).

DISCUSSION

The COVID-19 pandemic has the potential to have a negative impact on the mental health of healthcare workers (HCWs), who are on the front lines of this disaster. Monitoring rates of mood, sleep, and other mental health disorders is thus an immediate priority to understand mediating factors and advise specific interventions. The purpose of this studywas to assess the prevalence of depression, anxiety, and insomnia among healthcare workers during the Covid-19 outbreak in Saudi Arabia during the period from…..to……the results showed that the prevalence of depression and anxiety was59.32%, and 83.9%, respectively.

The results of the current study revealed that far higher rates of depression and anxiety were reported among HCWs in Saudi Arabia when compared with the results of a systematic review and meta-analysis study published in 2020 which showed the pooled prevalence of anxiety and depression was 23·2%, and 22·8%, respectively (Pappa et al., 2020). Also, another systematic review and meta-analysis study comprised 69 articles with a total sample size of 108,931 medical staff reported a pooled prevalence of anxiety, depression, and insomnia at 37%, 34%, and 39%, respectively (Rezaei-Hachesu et al., 2022), which are lower than what reported in the current study. In addition, the prevalence rates reported in the current study are also higher compared to another study published in Jordan, where approximately one-third of their participants reported severe symptoms of anxiety (29.5%), depression (34.5%) and insomnia (31.9%) (Oteir et al., 2022). A recently published (2022) local study addressing the same topic showed that most of the HCWs had mild levels of anxiety and depression. A total of 72.5% of the respondents had anxiety, ranging from mild (44.1%) to moderate (16.2%) and severe (12.2%). Moreover, 24.4% of the respondents had depression ranging from mild (21.7%) to moderate (2.1%) and severe (0.6%) (Shamsan et al., 2022).

Furthermore, the analysis revealed potentially important gender and occupational differences. The prevalence rate of anxiety and depression appeared to be higher in females, which probably reflects the already established gender gap for anxious and depressive symptoms. The higher prevalence of anxiety, depression, and insomnia among females compared to males in the current study is in line with previous studies (Pappa et al., 2020; Rezaei-Hachesu et al., 2022). In contrast to the Pappa et al. (2020 in their systematic review and meta-analysis, which showed that nursing staff exhibited higher prevalence estimates both for anxiety and depression compared to doctors, the current study showed that the anxiety score was the highest among doctors. However, for depression, the results were consistent, as both studies showed that it was higher among females. This could be explained by the fact that nurses are mostly female, but it could also be attributed to the fact that they are more likely to be exposed to COVID-19 patients because they spend more time on wards, provide direct care to patients, and are in charge of collecting sputum for virus detection [5]. Furthermore, because of their frequent contact with patients, they may be more vulnerable to moral harm related to suffering, mortality, and ethical quandaries.

Infection of colleagues, infection of family members, protective measures, and medical violence (Liu et al., 2020) were among the primary worries of HCWs in COVID-19-afflicted areas, according to a study that looked into aspects related to HCWs' psychological difficulties. Unsurprisingly, social support levels were found to positively connect with self-efficacy and sleep quality while adversely correlating with worry and stress (Xiao et al., 2020).

The interplay of frontline HCWs' anxiety, depression, and insomnia levels can still be explained by the

multifactorial transactional Lazarus theory of stress. The pandemic and the government's response to it have created a slew of variables that have prompted worry and stress responses.This extended pandemic anxiety, with no certain end of the epidemic on the horizon and no knowing of what repercussions this pandemic will bring to self, family, or the world, may create depressive symptoms.

Interventions that are targeted should be considered. Another study conducted in the initial epicenter of the pandemic, Wuhan, revealed that a substantial proportion of HCWs were impacted and that mental health treatment was required even for moderate psychological symptoms (Kang et al., 2020). Virtual clinics, remotely delivered psychiatric therapies and psycho-education, chat lines, digital phenotyping, and risk-monitoring technologies can all be provided in the contemporary setting. Finally, in addition to infected patients and HCWs, suspected cases who are home isolated, as well as families and friends of afflicted people, must be supported (The Lancet Psychiatry, 2020).

The present study has some limitations including the cross-sectional design, self-reported questionnaires and the participant selecting method may have led to reporting bias and/or selection bias. The results cannot be generalized, asresearchers must consider the study setting, participants' work settings as well as the interpretation of the results. In addition, the study did not compare mental health symptoms before and after the pandemic, and whether there was an evolution over time.

CONCLUSION

This study explored the prevalence of anxiety, depression,and insomnia and their associated factors among COVID-19HCWs in Saudi Arabia. The results highlighted that the prevalence of anxiety, depression, and insomnia are concerning, and considered far higher compared to what was reported globally in this regard.

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