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Psychological impact of the COVID-19 pandemic on healthcare professionals in the Al Ahsa Region, Saudi Arabia

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Summary **Background.** Recently, researchers have shown increased interest in the psychological effect of the pandemic on healthcare workers, as well as on the general population.
Objectives. We aimed to investigate the incidence of adverse psychological effects, such as anxiety, depression and post-traumatic stress disorder, experienced by medical staff and healthcare professionals during the COVID-19 pandemic.
Material and methods. This is a cross-sectional survey, in which participants were invited to take part in the study by completing a questionnaire. The survey gathered information on demographic data, symptoms of the Depression, Anxiety, Stress Scales (DASS-21) and the Impact of Events Scale-Revised (IES-R) tool.
Results. The total and subscale of DAS-21 showed that 54.8% of all participants showed signs of depression, (60.1%) anxiety and (59.4%) stress. The faculty member of medicine was substantially correlated with the DASS-21 subscale depression and anxiety. In addition, the stress subscale of the DASS-21 was substantially higher with a medical intern. Similarly, the findings obtained from the preliminary study of participants who encountered or were exposed to COVID-19 patients had significantly higher stress subscale ratings in the Depression, Anxiety, Stress Scales. In addition, the married participants were correlated with higher scores in the (IES-R) tool.
Conclusions. More than half of the participants in this study encountered mild to extreme psychological effects during the pandemic. This investigation's findings indicate that working in the medical profession (medical staff members and medical interns) is associated with depression, anxiety and stress.
Key words: anxiety, COVID-19, depression, healthcare professionals, mental health, occupational stress.

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Background

The world has been facing a new contagious disease, COVID-19, which was first described in Wuhan, China, and which spread globally in months. This pandemic of severe acute respiratory coronavirus 2 (SARS-COV-2) and its related disease, known as coronavirus disease 19 (COVID-19), has spread throughout the world and has drawn significant attention from around the globe [1]. The virus spread very rapidly, and 1,000 patients had been confirmed positive within the first two weeks [2]. At the time of preparation of this manuscript (01 December 2020), 62.4 million cases (and more than 1.5 million deaths) have been confirmed worldwide [3]. Between February and December 2020, there were more than 356,911 confirmed cases in Saudi Arabia and more than 5,870 deaths [3]. Several infectious diseases have occurred worldwide, including Middle East Respiratory Syndrome (MERS) in 2016, Ebola in West Africa in 2014 and Severe Acute Respiratory Syndrome (SARS) in China, parts of Asia and Canada in 2003 [4]. The most recent outbreak of COVID-19 resulted in an alarmingly high global death rate, with thousands of health works being infected [5].

In recent years, there has been renewed interest in the psychological effect of the pandemic on healthcare workers, as well as on the general population. Healthcare workers represent a highly vulnerable group in terms of the mental health effects of epidemics due to the high risk of infection, increased job stress and fear of spreading the disease to their families [6]. Extreme emotional stress was documented in earlier studies during or after the outbreak of infectious diseases among medical care workers in 2003 during the severe acute respiratory syndrome (SARS) epidemic [7]. Moreover, evidence suggests that Chinese individuals indicate that a large proportion of healthcare workers have signs of depression (50.4%), anxiety (44.6%), insomnia (34%) or pain (71.5%) [8]. It has previously been observed that healthcare workers on the front line are more at risk of experiencing psychiatric problems and mental health issues [9]. A systematic review and meta-analysis of 55 studies indicated that a high number of healthcare workers reported substantial levels of anxiety, depression and insomnia during the outbreak of COVID-19 [10].

Previous research has established that the risk of mental disorders such as depression, anxiety and post-traumatic stress increased due to containment measures, including compulsory or self-quarantine and social distancing [11], as has also been happening during the COVID-19 pandemic. The study provided important information about medical care workers, who have been shown to experience significant levels of emotional stress, anxiety, depression and PTS during or even after the outbreak

of infectious diseases [12]. One piece of evidence suggests that 5% of the medical care staff in a Taiwan hospital suffered from acute stress disorder during the outbreak of severe acute respiratory syndrome (SARS) [13].

Acute Stress Disorder (ASD) has similar clinical manifestations to post-traumatic stress disorder (PTSD), which can be identified 3 days to 1-month post-trauma and is a strong indicator of PTSD [14]. Nonetheless, there is limited evidence about the association between ASD and COVID -19, especially in Saudi Arabia. Therefore, this study aims to contribute to this growing area of research by exploring the occurrence of adverse psychological effects, anxiety, depression and PTSD encountered by medical care staff during COVID-19 pandemic.

Material and methods

The cross-sectional survey was planned to determine the psychological reactions of the Faculty of Medicine and medical interns at the College of Medicine, King Faisal University, as well as related factors during the COVID-19 pandemic. Participants were invited to participate in the study by completing a self-administered questionnaire between 1 September and 31 October 2020. A convenience sample of physicians was contacted to participate in this analysis. This questionnaire gathered information on demographics data and medical background. Participants were also asked if they had either been diagnosed with COVID-19 or were exposed to COVID-19 patients during hospital rotations.

Depression, anxiety and stress were evaluated using DASS-21, which is a self-reported 21-item framework developed by the University of New South Wales, Australia [15]. The scores for each of the three elements were determined by summing up the scores for the items in question and multiplying by two to determine the final score [15]. Cut-off scores of > 9, > 7 and > 14 represent a favourable assessment for depression, anxiety and stress, respectively. In the DASS-21 depression subscale, scores of 10–13 were considered as "mild", 14–20 as "moderate", 21–27 as "severe" and 28–42 as "highly severe" depression [15]. The DASS-21 anxiety subscale score was rated as "mild" (8–9), "moderate" (10–14), "severe" (15–19) and "highly severe" (20–24). The DASS-21 stress score was divided into "mild" (15–18), "moderate" (19–25), "severe" (26–33) and "extremely severe" stress [15].

Moreover, the psychological distress of the pandemic was measured using the Impact of Events Scale-Revised (IES-R), which is a 22-item self-report that measures the subjective distress caused by traumatic events. It has three subscales that are closely associated with post-traumatic stress disorder (PTSD) symptoms (Intrusion, Avoidance and Hyperarousal) [16]. Participants were requested to rate the level of distress for each component during the last seven days of their interview [16]. The overall IES-R score was rated as average (0–23), mild (24–32), moderate (33–36) and extreme psychological (> 37) for severity. A cut-off score of 24 was used to describe a clinical concern for PTSD [16]. DASS-21 and IES-R were used previously in assessing the psychological impact related to COVID-19 in Chain and Saudi Arabia [17, 18].

The incidence of physical symptoms exhibited by healthcare workers and the correlation between physical symptoms and psychological consequences of depression, anxiety, stress and post-traumatic stress disorders were examined. The questionnaire was distributed online in English. At the beginning of the survey, all respondents offered informed consent with a yes-no question indicating their willingness to participate in the study. The research followed all the ethical considerations, and approval was obtained from King Faisal University, Saudi Arabia.

The study was analysed using the Statistical Package for the Social Sciences (SPSS) version 26.0 statistical analysis software (New York, USA). Means and standard deviations were used for quantitative variables, frequencies and percentages were used for qualitative variables, One-Way ANOVA was used to test the significance of the difference between groups, the Chi-square test was used for the association between categorical variables, and a p-value < 0.05 was considered to be significant.

Results

The total number of responses from faculty members of medicine and medical interns who participated in this study was 133, with 66 (49.6%) males, 67 (42.9%) females, and a mean age of 30.15. The majority of the participants in this study were medical interns (95 – 71.4%), and most of the participants work at the hospital (86 – 64.7%), and the rest work at the college (47 – 35.3%). Most of the participants were living in urban areas, 50.4% were single, and 49.6% were married. 85% of the participants were not known to have any chronic disease. Correspondingly, the majority of participants did not experience or were exposed in the hospital or inside the family or circle of friends to any patient with symptoms of COVID-19 (64.9%) (Table 1).

Table 1. Socio-demographic variables

Variables	Categories	Numbers (%)
Gender	male	66 (49.6)
	female	67 (50.4)
Occupation	faculty member	38 (28.6)
	intern	95 (71.4)
Working place	college of medicine	47 (35.3)
	hospital	86 (64.7)
Marital status	single	67 (50.4)
	married	66 (49.6)
Living area	urban	111 (83.5)
	rural	2 (1.5)
	village	20 (15.0)
Chronic disease	yes	20 (15.0)
	no	113 (85.0)
List of chronic disease	DM	8 (6.02)
	other	4 (3.01)
	high blood pressure	4 (3.01)
	bronchial asthma	2 (1.5)
	DM, high blood pressure, bronchial asthma	1 (0.75)
	DM, high blood pressure	1 (0.75)
Experienced or exposed in the hospital or inside the family or circle of friends to any patient with COVID-19	yes	48 (39.02)
	no	85 (69.11)

As shown in Table 2, the total of DAS-21, 73 (54.8%) of all participants have a degrees level of depression, 80 (60.1%) of anxiety, and 79 (59.4%) of stress. For the depression subscale, 9% of the sample reported mild depressive symptoms, 12% reported moderate symptoms, 29.3% reported severe symptoms, and 4.5% reported extremely serious depressive symptoms. For the anxiety subscale, 6% of the sample were considered to have mild symptoms of anxiety, 15% moderate anxiety, 9.8% serious, and 29.3% extremely severe symptoms of anxiety. For the stress subscale, 23.3% of the sample reported mild symptoms of stress, 24.8% reported moderate symptoms, 3.8% reported severe symptoms, and 7.5% reported extremely severe symptoms of stress. Mean DAS-21 scores are shown in Table 3. There

was a correlation between the participants' age and the severe depression subscales, extremely severe anxiety subscales and mild stress subscales.

Participants who experienced or were exposed in the hospital or inside the family or circle of friends to any patient with symptoms of COVID-19 (36.1%) were able to answer the IES-R questionnaire. The participants' average score on the IES-R questionnaire was 21.71 ± 19.11 (Figure 1). Out of the total, 14.3% of the participant's diagnosis is post-traumatic stress disorder (Figure 1). The results of the correlational analysis are summarised in Table 4. The faculty member medicine as an occupation was significantly associated with the depression and anxiety subscale of the DASS. The stress subscales of the DASS was also significantly higher with medical interns. Similarly, the results obtained from preliminary analysis of the participants who experienced or were exposed to patients with COVID-19 were considerably higher on the DASS 21 stress subscales (Table 3). Additionally, the most striking aspect of Table 5 is that married participants were associated with higher scores in the IES-R.

Table 2. Participants' performance on the three subscales of the Depression, Anxiety and Stress Scale – 21 Items (DASS-21)

Variables	Categories	Frequency (%)
Depression	normal	60 (45.1)
	mild	12 (9.0)
	moderate	16 (12.0)
	severe	39 (29.3)
	extremely severe	6 (4.5)
Anxiety	normal	53 (39.8)
	mild	8 (6.0)
	moderate	20 (15.0)
	severe	13 (9.8)
	extremely severe	39 (29,3)
Stress	normal	54 (40.6)
	mild	31 (23.3)
	moderate	33 (24.8)
	severe	5 (3.8)
	extremely severe	10 (7.5)

Table 3. Subscales of the Depression, Anxiety and Stress Scale - 21 Items (DASS-21) and participants' age

Subscales	Age	*n*	Mean	Std. Deviation	Std. Error	F	*p**
Depression	normal	60	26.43	5.759	0.743	5.568	0.000
	mild	12	33.17	13.016	3.757		
	moderate	16	33.88	11.430	2.858		
	severe*	39	34.31	12.486	1.999		
	extremely severe	6	24.33	0.816	0.333		
Anxiety	normal	53	28.11	8.259	1.135	3.786	0.006
	mild	8	30.63	8.717	3.082		
	moderate	20	25.45	4.915	1.099		
	severe	13	32.54	12.666	3.513		
	extremely severe*	39	34.44	12.384	1.983		
Stress	normal	54	26.61	6.036	0.821	6.490	0.000
	mild*	31	35.03	12.529	2.250		
	moderate	33	33.85	12.220	2.127		
	severe	5	24.80	0.447	0.200		
	extremely severe	10	24.60	0.966	0.306		

* Statistically significant.

Table 4. Association between socio-demographic variables and the subscales of the Depression, Anxiety and Stress Scale – 21 Items (DASS-21)

Socio-demographic variables and DASS-21scale	Chi-square	*p*
Occupation (Faculty Members)* Depression	14.940	0.005*
Occupation (Faculty Members)* Anxiety	13.765	0.008*
Occupation (Interns)* Stress	18.818	0.001*
List of chronic disease (Bronchial Asthma)* Stress	31.014	0.009*
Experienced or exposed in the hospital or inside the family or circle of friends to any patient with COVID-19* Stress	13.077	0.011*

* Statistically significant.

Table 5. Association between socio-demographic variables and Impact of Event Scale-Revised (IES-R)

Socio-demographic variables and IES-R	*p*
Gender	0.185
Occupation	0.790
Working place	0.790
Marital status (Married*)	0.004*
Living area	0.418

* Statistically significant.

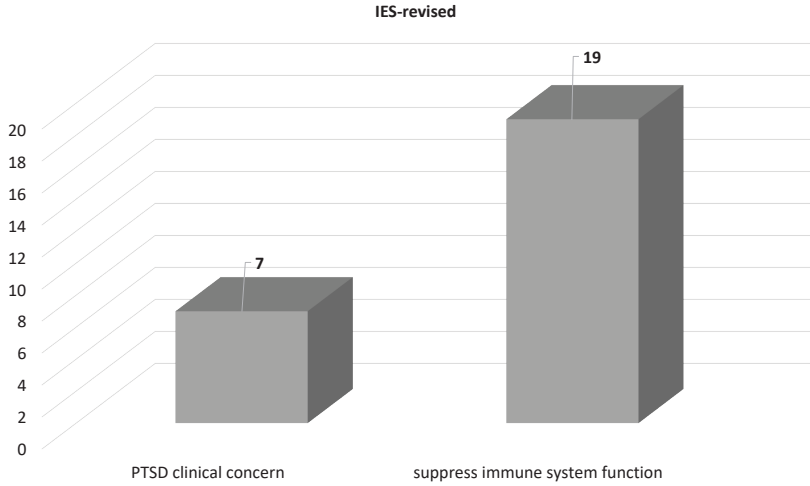

Figure 1. Participants' performance on the Impact of Event Scale-Revised (IES-R)

Discussion

The purpose of the study was to investigate the impact of adverse psychological effects, anxiety, depression and PTS experienced by medical staff (faculty of medicine and medical interns) during the COVID-19 pandemic. The most prominent finding from the study is that the DAS-21 subscale revealed that 54.8% of all participants had symptoms of depression, 60.1% anxiety and 59.4% stress. Additionally, the results of the subscale of DAS-21 of this study indicate that there was a correlation between the participants' age and the severe depression subscales, extremely severe anxiety subscales and mild stress subscales. A comparison of the findings with those of other studies confirms that primary emotional and physical responses, such as depression, fear, PTSD, insomnia and somatic symptoms, have been observed in hospital staff [19–22]. It is also encouraging to compare this figure with that of Moghanibashi-Mansourieh (2020), who found that the level of severe anxiety reported in Iran was 19.1% during the pandemic [23].

Likewise, recent research conducted in Saudi Arabia, recruiting 1,160 respondents from the general population, reveals that 23.6% reported moderate to extreme psychological effects during the epidemic, and 28.3%, 24%, and 22.3% reported moderate to severe symptoms of depression, anxiety and stress, respectively [17]. These findings also appear to be consistent with other studies found in China, where 53.8% reported moderate or extreme psychological effects of the epidemic, and 16.5%, and 28% reported symptoms of depression and anxiety ranging from moderate to severe. In comparison, 8.1% reported moderate to severe stress levels [18].

Moreover, the current study found that in the IES-R, 14.3% of the participants were diagnosed with a post-traumatic stress disorder. These results match those observed during the SARS pandemic in Taiwan, which recorded that among doctors and nurses working in an emergency department the prevalence of PTSD was 21.7% [24].

Similarly, the results are in agreement with those obtained by Reynolds et al. (2008), which observed that healthcare staff who were quarantined during the SARS pandemic in Canada showed higher levels of post-traumatic stress than those who were quarantined in the general population [25]. Correspondingly, recent research is in line with those of previous studies which observed that 7% of adults woman living in Wuhan and surrounding cities in China met the diagnostic criteria for PTSD after a month the COVID-19 outbreak [26].

The faculty member medicine as an occupation was significantly associated with the depression and anxiety subscale of the DASS. A possible explanation for this is that the faculty member of medicine works in direct hospital contact with patients. These results are consistent with data obtained in China, where the level of stress among healthcare staff was almost 30.56% and 71.5% in two separate studies [8, 27]. Likewise, the stress subscales of the DASS were significantly higher with medical interns. In line with the present findings, previous studies have shown that medical students have higher baseline anxiety rates compared to the general population [28]. It is promising to compare this statistic with that found in China by Lai et al. (2020), who found that about half of the participants had symptoms of depression, discomfort, anxiety and insomnia [8].

Furthermore, the study discovered a substantial link between married individuals and higher scores of IES-R. Existing research indicates that healthcare workers on the frontline are more at risk of developing psychological problems and mental health disorders [9]. Correspondingly, recent research has shown that women are at higher risk of developing symptoms of anxiety and depression during COVID-19 quarantine than men [25, 29]. Supportive measures can play an essential role in protecting one from psychological problems. This is consistent with previous studies in which successful coping and social support were the most significant buffering factors for negative psychological well-being among medical workers [30].

Limitations of the study

A limitation of this study is that it was performed in a specific group (faculty member of medicine and medical interns), and the response rate varied from group to group, which might affect the generalisation of the study. The sample size of the questionnaire survey was small, and a more extensive sample survey will help reduce bias. This study offers only a snapshot of the psychological reactions at a specific point in time, and a longitudinal study is needed to provide evidence as to whether the observed effect will last longer. Despite these limitations, these results improve our knowledge of the mental health issues faced by members of the faculty of medicine and medical interns during a pandemic. Finally, these studies are also projected to improve the clinical experience in minimising the adverse psychological effects associated with infectious diseases.

Conclusions

This study has identified that more than half of the participants experienced a moderate to severe psychological impact during the pandemic. The results of this investigation show that working in the medical field (faculty members of medicine and medical interns) was significantly associated with depression, anxiety and stress. The research has also shown that married participants were associated with higher scores in the IES-R.

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