Original Article :

Depression, Anxiety, And Insomnia Among Health Practitioners During Covid-19 Pandemic In Taif, Saudi Arabia

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Abstract

Background & Aims:

Health practitioners are facing stressful situations during COVID-19 outbreak which may affect their mental health. This study aimed to assess depression, anxiety, and insomnia among health practitioners and possible risk factors during COVID-19 outbreak in Taif, Saudi Arabia.

Methods:

A cross-sectional study was done among health practitioners in Taif governorate from April to June 2020, using online questionnaires including: the 9-item Patient Health Questionnaire (PHQ-9), the 7-item Generalized Anxiety Disorder (GAD-7) scale, the 7-item Insomnia Severity Index (ISI).

Results:

Total number of participants was 804; of them, 541 (67.4%) were males and 64.3% were Saudi. The mean age of study participants was 36.7 years (SD ±8.27). The majority were nurses (48.1%) followed by doctors (21.9%). Among all participants, the prevalence of 'significant' depression, GAD, and insomnia was 31.1%, 19.1%, and 15.6% respectively. Proportions were much higher when including those who have even mild symptoms; and they were 58%, 44.1%,

الملخص

الخلفية و الاهداف :

الاكتئاب والقلق والأرق لدى الممارسين الصحيين خلال جائحة كوفيد-١٩ في الطائف، المملكة العربية السعودية. هدفت هذه الدراسة إلى تقييم الاكتئاب والقلق والأرق لدى الممارسين الصحيين وعوامل الخطر المحتملة أثناء تفشي جائحة كوفيد-١٩ في الطائف بالمملكة العربية السعودية.

طريقة البحث :

دراسة مقطعية كمية أجريت على الممارسين الصحيين في محافظة الطائف في الفترة من ابريل الى يونيو ٢٠٢٠، باستخدام الاستبيانات عبر الإنترنت والتي تضمنت: العوامل الاجتماعية الديموغرافية، استبيان صحة المريض المكون من ٩ عناصر (PHQ-٩)، ومقياس اضطراب القلق العام المكون من ٧ عناصر (GAD-٧)، مؤشر شدة الأرق المكون من ٧ عناصر (ISI).

النتائج :

بلغ العدد الإجمالي للمشاركين ٨٠٤ شخصا؛ منهم ٥٤١ (٦٧,٤٪) ذكور و٦٤,٣٪ سعوديون. كان متوسط عمر المشاركين ٣٦,٧ سنة (SD ± ٨,٢٧). كانت الغالبية من الممرضين (٤٨,١٪) يليهم الأطباء (٢١,٩٪) ثم المجالات الأخرى. كان معدل انتشار الاكتئاب، واضطراب القلق العام، والأرق بين جميع المشاركين ٣١,١٪ و١٩,١٪ و١٥,٦٪ على التوالي. أما عند تضمين أولئك الذين لديهم أعراض خفيفة فقد كانت النسب أعلى بكثير؛ حيث بلغت ٥٨٪ و٤٤,١٪ و٤٣,٧٪ على التوالي. أظهرت الدراسة ارتباط الاضطرابات النفسية التي تم فحصها بالإناث، وبالسعوديين، والأصغر عمرا، ومن كان

and 43.7%, respectively. Female gender, being Saudi, younger age and direct contact with COVID-19 patients were the main risk factors for psychiatric disorders investigated, while having children and age ≥40 years were protecting factorsc .

Conclusion:

High rates of mental health problems among health practitioners were found which require immediate intervention to protect, support and treat those in need. Mental health research among this special group is recommended.

Keywords:

Coronavirus, COVID١٩-, Health personnel, Mental Health, Saudi Arabia

لهم اتصال مباشر بمرضى كوفيد -١٩، في حين أن إنجاب الأطفال وكون العمر من ٤٠ عاماً فما فوق كانت عوامل وقائية.

الخلاصة:

ارتفاع معدلات مشاكل الصحة النفسية بين الممارسين الصحيين يتطلب تدخلاً فورياً لحماية ودعم وعلاج المحتاجين. يوصى الباحثون بإجراء مزيد من بحوث الصحة النفسية بين هذه المجموعة الخاصة.

Introduction

In mid-December 2019 a Novel Coronavirus Infected Pneumonia (NCIP) has emerged in Wuhan, Hubei Province, China[1]. The World Health Organization (WHO) announced on January 30th, 2020, the appearance of the new coronavirus (nCOV-19) and declared Public Health Emergency of International Concern (PHEIC) [2]. Kingdom of Saudi Arabia (KSA) has taken the first response on the beginning of February 2020 to the declared PHEIC ordering the evacuation of its citizens from Wuhan, Beijing, and then Hong Kong, Then WHO officially named the novel coronavirus as Corona Virus Disease 2019 (COVID-19) on the 11th of February 2020 [2]. The First case of COVID-19 was confirmed in KSA on the 2nd of March 2020 [3] and a few days later, WHO characterized COVID-19 as a pandemic [2]. In response to this, KSA suspended all international flights.

While preparing this paper, certainly at the beginning of June 2020, numbers of confirmed COVID-19 cases exceeded 6 million with more than 372 thousand deaths worldwide, including more than 87 thousand confirmed cases with 525 deaths in KSA. Locally in Taif, Saudi Arabia, there were a total of 1,574 cases with two deaths so far [3].

Facing this critical situation, the world population is put under exceptional stress; the lockdown, social distancing, financial insecurities, etc. Healthcare workers are not an exception but are rather overwhelmed by the current health challenges especially those who are on the front line facing COVID-19 Pandemic. Previous studies have reported on negative psycho-

logical impact on medical staff due to 2003 SARS outbreak 4,6. Maunder R, Hunter J et al found that medical practitioners were afraid of transmitting infection to their family, friends, and colleagues, felt uncertain and stigmatized, and reported reluctance to work, or consider resignation [4]. Bai Y, Lin CC et al reported that healthcare workers experienced high levels of stress, anxiety [5]. Antoinette M Lee et al. added that healthcare workers also had depression symptoms, which could have long-term psychological implications [6].

Similar concerns about the mental health and adverse psychological reaction among medical staff taking care for patients with COVID-19 are now arising, since recent studies in China have shown that Health practitioners bear a significant psychological burden [7], Wen-Rui Zhang and Kun Wang et al found that healthcare workers had a higher prevalence of insomnia, anxiety, somatization, obsessive-compulsive symptoms and depression, [8] especially those having an underlying organic illness, living in rural areas 8, females, and front-line healthcare workers directly in contact with COVID-19 patients [8,9].

To deal with the secondary mental health problems involved in the COVID-19 pandemic, we need to understand the magnitude of the pandemic effect on mental health, define the most vulnerable groups and analyze the arising symptoms among healthcare workers, on local and international levels. This study aimed to provide an assessment of the mental health problems among Taif health practitioners, in terms of symptoms of depression, anxiety, and insomnia, with analyzing potential risk factors associated with these symptoms, which can serve as important evidence to direct the promotion of mental wellbeing among this special group.

Methods:

This is a quantitative cross-sectional study conducted among healthcare professionals in Taif, Kingdom of Saudi Arabia. Data were collected during the period from 29th of April to 20th of May 2020 through the use of anonymous self-reported questionnaires including the socio-demographic and work-related factors, and the 9-item Patient Health Questionnaire (PHQ-9) which has total scores ranging from 0-27 [10]. A score of 10 has been recommended by several studies as the cut-off score for diagnosing major depressive disorder [11, 12, 13]. The second scale was the 7-item Generalized Anxiety Disorder (GAD-7) scale which ranges from 0-21 as a total score [14] with a cut-off score of 10 for diagnosis [15, 16]. The last scale was the 7-item Insomnia Severity Index (ISI) which has a maximum score of 28 [17] and a cut-off score of 15 for

significant insomnia [18, 19].

The following equation was used to determine the sample size: N= (Z2PQ)/D2, While N is sampling size, Z is standard normal deviation at 95% confidence level (Z= 1.96), P is the proportion in target population from a previous study which was 50% 7, Q= 1–p, and D is degree accuracy which was set at 0.05. The sample size according to this equation was 384 but it was decided to increase the sample size by 100% to minimize the effect of any possible sampling error.

Stratified sampling was applied by defining the target population; health practitioners in Taif, Saudi Arabia, deciding the stratification variables which was the occupation; doctors, nurses, and others, then a proportional sampling intended to decide the size of each subgroup. But due to special regulations and precautions during COVID-19 pandemic, an online questionnaire was sent to official workgroups of health practitioners and some sort of self-selection affected sampling.

Data collected were analyzed using Statistical Package for social studies (IBM SPSS) version-24. Distribution and prevalence were presented in numbers and percentages. Analysis of variance (ANOVA) was used to compare means of different scales' results. Chi-square test and odds ratios with confidence intervals were used to examine the association between the presence of depression, anxiety, and insomnia and different socio-demographic and work factors. A P-value < 0.05 was chosen as the level of significance.

Ethical approval was obtained from the ethical committee of the Administration of Research and Studies, Ministry of Health in Taif. Informed consent was obtained from all participants. Confidentiality, anonymity, and voluntary participation was assured.

Results:

After excluding responses from outside Taif, the total number of health practitioners who completed the questionnaire was 804. Two-thirds of participants (67.4%) were males (n=541) and 64.3% were Saudi as shown in table 1. The mean age of participants was 36.7 years (SD= ±8.27) and they were from different health fields but the majority were nurses (48.1%) followed by doctors (21.9%). Six hundred (74.7%) were married, and 539 (67.1%) were having children. Participants' work experience was ranging from less than one year to 41 years, with a mean of 11.1 years (SD= ±7.98). Other respondents' characteristics are presented in table 1.

Among all participants, 250 (31.1%) scored 10 or more in PHQ-9 which considered the cut-off score for diagnosing de-

Table 1: Socio-demographic data of the participants:

Socio-demographic factors		N	%
Gender	Males	541	67.4
	Females	262	32.6
Nationality	Saudi	516	64.3
	Non-Saudi	287	35.7
Age	Below 30	137	17.1
	30-39	425	53
	40 or above	240	29.9
Health fields	Doctor	176	21.9
	Nurse	386	48.1
	Laboratory technologist	60	7.5
	Pharmacist	56	7.0
	Psychologist	9	1.1
	Social worker	42	5.2
	Others	74	9.2
Marital status	Single	178	22.2
	Married	600	74.7
	Divorced	23	2.9
	Widowed	2	0.2
Having children	Yes	539	67.1
	No	264	32.9
Educational level	Diploma	256	32.0
	Bachelor	377	47.2
	Master	75	9.4
	PhD or MD	34	4.3
	Board or Fellowship	57	7.1
Having chronic diseases	Yes	139	17.3
	No	664	82.7
Diagnosed with psychiatric disorders	Yes	24	3.0
	No	779	97.0
Line in facing COVID-19	First-line	399	49.7
	Second-line	404	50.3
Diagnosed with COVID-19	Yes	10	1.2
	No	793	98.8
Direct contact	Yes	389	48.4
	No	414	51.6
Treating COVID-19 patients	Yes	252	31.4
	No	551	68.6
Total		804	100%

pression ranging from moderate to severe (Table 2). Those who scored 10 or more in GAD-7 were 153 participants (19.1%). Regarding insomnia, 125 participants

(15.6%) were found to have moderate or severe insomnia according to ISI (Table 2). All participants who showed symptoms of depression, anxiety, and insomnia, including mild symptoms, were 467 (58%), 355 (44.1%), and 352 (43.7%) respectively.

Table 2: Depression, Anxiety, Insomnia scores among all health practitioners:

		Number	%
PHQ-9	Minimal or none	337	42.0
	Mild Depression	216	26.9
	Moderate Depression	131	16.3
	Moderately severe	78	9.7
	Severe Depression	41	5.1
GAD-7	Minimal or none	449	55.9
	Mild Anxiety	201	25.0
	Moderate Anxiety	81	10.1
	Severe Anxiety	72	9.0
ISI	Not significant	452	56.3
	Sub threshold	226	28.1
	Moderate insomnia	81	10.1
	Severe insomnia	44	5.5
Total		804	100%

PHQ-9 scores were found to be higher among female health practitioners; with mean scores of 8.28 (SD= ±5.98), compared with mean scores of males which was 6.85 (SD= ±6.30) a result which was statistically significant (P-value= 0.002). PHQ-9 scores were also significantly higher among Saudi participants, younger ages, single and widowed, those who don't have children, those who had only bachelor degree as a level of education (Table3), having direct contact with COVID-19 cases, and having fewer years of experience. Among doctors, residents had higher PHQ-9 scores compared with registrars and consultants.

Regarding anxiety, it was higher according to GAD-7 scores mean in female practitioners, Saudi, younger ages, those who don't have children, those who had diploma or bachelor degree, those who had chronic diseases, having a previous diagnosis of a psychiatric disorder, having direct contact with COVID-19 cases, pharmacists, having fewer years of experience, and residents compared with other doctors (Table 3).

Regarding insomnia, mean scores of ISI were higher among female gender, Saudi nationality, younger ages, being singles, having no children, having only bachelor degree, those who work in the COVID-19 first-line, those who had direct contact with COVID-19 cases, pharmacists com-

pared with other health practitioners, those with fewer years of experience, and among resident compared with other doctors (Table 3).

Table 3: Comparing Depression, Anxiety, insomnia scores according to socio-demographic factors and work factors in relation to COVID-19:

Socio-demographic and work factors Mean (SD)		PHQ-9		GAD-7		ISI	
		P-value	Mean (SD)	P-value	Mean (SD)	P-value	
Gender	Males	6.85 (6.30)	0.002*	4.90 (5.43)	0.016*	7.22 (6.74)	0.019*
	Females	8.28 (5.98)		5.91 (5.76)		8.41 (6.70)	
Nationality	Saudi	7.91 (6.60)	<0.001*	5.74 (5.89)	<0.001*	8.16 (7.24)	0.002*
	Non-Saudi	6.26 (5.34)		4.31 (4.77)		6.62 (5.64)	
Age	Below 30	9.50 (6.73)	<0.001*	6.17 (6.28)	<0.001*	9.55 (7.57)	<0.001*
	30-39	7.76 (5.97)		5.72 (5.66)		8.12 (6.42)	
	40 or above	5.33 (5.82)		3.83 (4.63)		5.62 (6.34)	
Marital status	Single	8.46 (6.32)	0.041*	5.72 (5.91)	0.436	9.21 (7.16)	0.003*
	Married	6.99 (6.17)		5.05 (5.45)		7.14 (6.61)	
	Divorced	6.78 (5.95)		6.09 (5.42)		7.91 (5.27)	
	Widowed	10.5 (10.61)		6.50 (7.78)		3.00 (2.83)	
Having children	Yes	6.71 (6.02)	<0.001*	4.92 (5.30)	0.025*	6.99 (6.45)	<0.001*
	No	8.56 (6.47)		5.86 (6.02)		8.86 (7.16)	
Educational level	Diploma	7.56 (6.35)	<0.001*	5.60 (5.84)	0.032*	7.85 (7.16)	0.003*
	Bachelor	8.03 (6.28)		5.56 (5.64)		8.21 (6.58)	
	Master	5.19 (5.24)		4.03 (4.98)		6.40 (6.53)	
	PhD/MD	5.00 (5.40)		3.71 (4.24)		4.12 (4.17)	
	Board/Fellowship	6.21 (6.00)		4.19 (4.72)		6.63 (6.71)	
Having chronic diseases	Yes	8.26 (6.75)	0.051	6.28 (6.13)	0.014*	8.41 (7.32)	0.123
	No	7.12 (6.10)		5.01 (5.41)		7.44 (6.61)	
Diagnosed with psychiatric disorders	Yes	9.75 (6.05)	0.052	7.79 (4.21)	0.022*	9.50 (5.81)	0.163
	No	7.25 (6.22)		5.15 (5.58)		7.55 (6.77)	
Line in facing COVID-19	First-line	7.69 (6.50)	0.097	5.55 (5.70)	0.108	8.17 (7.18)	0.019*
	Second-line	6.96 (5.94)		4.92 (5.40)		7.05 (6.25)	
Diagnosed with COVID-19	Yes	11.10 (7.13)	0.053	7.60 (6.90)	0.175	8.80 (7.30)	0.574
	No	7.27 (6.21)		5.20 (5.54)		7.59 (6.74)	
Direct contact	Yes	8.51 (6.59)	<0.001*	6.19 (5.92)	<0.001*	8.86 (7.24)	<0.001*
	No	6.20 (5.65)		4.33 (5.04)		6.43 (6.02)	
Health fields	Doctor	6.60 (5.85)	0.056	4.92 (4.88)	0.016*	6.69 (5.91)	0.029*
	Nurse	7.60 (6.36)		4.97 (5.55)		7.74 (6.80)	
	Laboratory technologist	6.68 (4.65)		4.88 (4.78)		8.45 (7.85)	
	Pharmacist	8.57 (6.63)		7.43 (7.00)		9.18 (6.88)	

Socio-demographic and work factors Mean (SD)		PHQ-9		GAD-7		ISI	
		P-value	Mean (SD)	P-value	Mean (SD)	P-value	
Health fields	Psychologist / social worker	5.76 (7.20)	0.056	4.65 (5.84)	0.016*	5.76 (7.39)	0.029*
	others	8.20 (6.24)		6.32 (5.93)		8.49 (6.44)	
Years of experience	Below 10 years	8.01 (6.25)	<0.001*	5.82 (5.82)	0.005*	8.34 (6.74)	0.001*
	10-19	7.27 (6.14)		4.95 (5.42)		7.37 (6.63)	
	20 or above	5.26 (5.95)		4.04 (4.83)		5.88 (6.69)	
Position for doctors	Resident	8.20 (5.97)	0.008*	6.05 (5.21)	0.029*	8.14 (6.25)	0.010*
	Registrar	6.23 (5.74)		4.79 (4.90)		6.69 (6.11)	
	Consultant	4.65 (5.29)		3.45 (3.95)		4.53 (4.36)	

According to table 4, risk factors of developing significant depression (PHQ-9 ≥10) included female gender, being Saudi, age <30, and direct contact. Having children appeared to act as protective factor as well as age ≥40. Risk factors of generalized anxiety disorder (GAD-7 ≥10) included being Saudi, age <30 and direct contact, while protective factors included having children, age ≥40 and being a doctor in comparison to other health fields. Regarding insomnia (ISI ≥15), risk factors were female gender, being Saudi, age <30, being in the first-line, and having direct contact. Protective factor of insomnia included age ≥40, having children, and being a doctor.

Table 4: Factors associated with depression, anxiety and insomnia in health practitioners dealing with the COVID-19 (P-value resulted from chi square test)

Independent Factors	Depression (PHQ-9 ≥10)				Anxiety (GAD-7 ≥10)				Insomnia (ISI ≥15)			
	P-value	OR	95% CI		P-value	OR	95% CI		P-value	OR	95% CI	
			Lower	Upper			Lower	Upper			Lower	Upper
Female	0.005*	1.58	1.15	2.17	0.053	1.43	0.99	2.07	0.044*	1.49	1.01	2.20
Saudi	0.014*	1.49	1.08	2.06	0.001*	1.95	1.31	2.91	<0.001*	2.20	1.42	3.42
Age <30	<0.001*	2.03	1.40	2.94	<0.001*	2.11	1.40	3.18	0.001*	2.13	1.38	3.29
Age ≥40	<0.001*	0.40	0.28	0.58	<0.001*	0.37	0.23	0.59	0.001*	0.46	0.28	0.74
Having children	0.011*	0.67	0.49	0.91	0.046*	0.69	0.48	0.99	0.005*	0.58	0.40	0.85
Doctor	0.168	0.77	0.53	1.12	0.037*	0.61	0.39	0.98	0.003*	0.44	0.25	0.76
First-line	0.341	1.61	0.86	1.56	0.559	1.11	0.78	1.58	0.015*	1.60	1.09	2.34
Direct contact	<0.001*	2.11	1.55	2.86	<0.001*	2.05	1.43	2.94	<0.001*	2.32	1.57	3.44

Discussion:

Previous studies during Severe Acute Respiratory Syndrome (SARS), the Middle East respiratory syndrome Coronavirus

(MERS-CoV), and recently during COVID-19 pandemic, have found considerable psychological effects on healthcare workers [20, 21, 22]. This current study included 804 health practitioners from Taif governorate during COVID-19 pandemic and showed a high prevalence of mental health symptoms; where 58%, 44.1%, and 43.7% of all participants reported symptoms of depression, anxiety, and insomnia, respectively. This is comparable to the findings of a recent study on COVID-19 in china where 50.4%, 44.6%, and 34.0% of health practitioners reported symptoms of depression, anxiety, and insomnia, respectively[7]. Some studies reported less prevalence of mental health symptoms during COVID-19 such as a study of Zhou Zhu et al. in Wuhan during COVID-19 which found that 29.8%, 13.5%, and 24.1% of health worker reported stress, depression, and anxiety symptoms [23]. This relatively lower prevalence was also found in Singapore, where proportions were 14.5% for anxiety, 8.9% for depression, 6.6% for stress, and 7.7% for Posttraumatic Stress Disorder [24]. On the other hand, other studies reported more prevalence such as a study done on health practitioners during Taiwan's SARS outbreak in 2003 and showed that 77.4% of health practitioners reported anxiety and worrying, and 74.2% reported depression[25]. As well, a study done in Hong Kong during SARS outbreak in 2003, found that 68% of healthcare workers have severe levels of job-related stress, and 57% have experienced psychological distress [26]. These remarkable variations between different studies may be attributed to several factors such as different scales used and different study areas where many factors may contribute to mental health problems, not only the exposure to the outbreak-related stressors. Another important notion is that even mild symptoms were included in some studies, while other studies considered only those with moderate to severe symptoms. Under the later condition, our current study proportions will be 31.1%, 19.1%, and 15.6% for the prevalence of depression, GAD, and insomnia, respectively.

Our study showed that females have higher scores of depression, anxiety, and insomnia according to the scales used, and female gender was a risk factor for developing significant levels of these disorders, e.g. OR= 1.58 for depression (table 4). This finding is similar to studies results from China and Italy during COVID-19 pandemic [27, 7], and it is expected since gender difference in depression and anxiety is already established [28, 29].

The second factor which showed significant association with more symptoms in all scales was younger age, and the risk

of having depression, generalized anxiety disorder, and insomnia is doubled in the age group <30 years. Again this is similar to previous studies results done in China and Italy during COVID-19 pandemic [27, 7]. Liang et al. in 2020 found that the younger age of healthcare workers (<30) was associated with higher self-rated depression scores, although this was not a statistically significant difference [30]. Some studies found age-group-related differences in the subject matter of worry; worries of health practitioners of younger ages were mainly about infecting their families, while in older ages they were more directed towards the patient's death [31, 22].

The effect of age may be related to the other result in this current study which was the years of experience since more symptoms of depression, anxiety, and insomnia were associated with little work experience among the surveyed healthcare workers. This result is supported by the previously mentioned studies in China and Italy[27, 7]. Being junior was an independent risk factor for anxiety and depression among healthcare workers according to Xiao et al. in 2020 [32]. Fewer years of experience may be associated with the junior position and so more obligations, more workload, and sometimes more contact with patients; factors that may increase stress.

Having direct contact with COVID-19 patients, per se, was associated with higher scores in all scales of interest in the current study and was an independent risk factor for developing significant depression, GAD, and insomnia. In agreement with this finding, the study of Xiao et al. in 2020 stated that contacting COVID-19 patients directly for all kinds of healthcare workers was independent risk factors for anxiety and depression [32]. The same results were proved by several studies [27, 7]. This was significant for actual contact with COVID-19 patients and not just being in the first-line since the difference in the latter case was significant only in insomnia in our study. This may be because those health workers in the first-line see different diagnoses and they may, or may not, contact suspected or confirmed cases of COVID-19.

Among socio-demographic factors, single health practitioners showed significantly higher scores in depression and insomnia scales compared with married ones, but the difference was not statistically significant when 'being single' was examined as a risk factor for moderate to severe depression, GAD, and insomnia. Having children was a protective factor from depression, GAD, and insomnia. This may be consistent with a study from Singapore that found that single doctors were at higher risk of developing psychological symptoms [23], as well as other studies with similar results in

the general population [33]. Having children is a protective factor from burnout [34], and even suicide [35].

The current study showed that being Saudi was a risk factor of developing depression, GAD, and insomnia, which seems to be unexpected since there are many studies that proved that foreigners have more psychological stressors, less support, and more symptoms of depression, adjustment disorders, or even suicidal ideation in comparison with native workers [36, 37, 38]. Although Saudi participants were significantly younger than non-Saudi ones, having significantly fewer years of experience, but these were not acting as confounders, since the result was significant after using logistic regression to adjust confounding factors including sex, age, years of experience, health field, working position (first-line or second-line), and having direct contact. So being Saudi was an independent risk factor for depression, GAD, and insomnia in this study population. One factor that can be suggested as an interpretation to this finding, it is that Saudi health workers may have an added stressor which is being afraid of transmitting infection to their extended families especially the elderly, and this is not applied to foreign health workers. The significance of this factor; being worried about harming family, was pointed out in a previous study among healthcare workers [31, 22]. However, our study finding needs more investigation to understand its reasons.

This study has a main limitation which is its sampling technique when online questionnaires sent to official workgroups of health practitioners, which allowed some sort of self-selection. Another limitation is that it gives information only about the situation at the time of data collection which may not reflect the whole picture as the COVID-19 pandemic is still expanding.

Conclusion:

Health practitioners in Taif, Saudi Arabia, reported high rates of depression, anxiety, and insomnia during the COVID-19 outbreak. The main risk factors for these problems were female gender, being Saudi, younger age and direct contact with COVID-19 patients. Researchers recommend immediate intervention to protect at-risk health practitioners, to support and treat those who are already suffering from mental health problems, and to promote mental health research among this special group.

Competing Interests:

The authors declare no conflicts of interest.

Authors' Contributions:

AI: designed the study, wrote methodology, carried out statistical analysis, interpreted results, and wrote most of discus-

sion and revised the whole manuscript.

IA: designed the questionnaire, participated in data collection, and wrote a part of discussion.

HH: wrote introduction and literature review.

AA: helped in data collection and communication with authorities.

All authors read and approved the final manuscript.

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