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ORIGINAL ARTICLE

Assessment of anxiety among the residents of family medicine during the COVID-19 pandemic in Saudi Arabia

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ABSTRACT

Background: Healthcare providers face a great pressure of diagnosing, isolating, and treating patients who are affected by COVID-19 as well as the fear of being infected with the virus and passing it on to loved ones and family members. This study aimed to assess the anxiety among the residents of family medicine during the COVID-19 pandemic in Saudi Arabia.

Methodology: This study was a cross-sectional survey of multicenter hospitals in Saudi Arabia. A self-administered English questionnaire was used for data collection.

Results: Out of 349 participants, 52.1% of the residents were male, 75% were between 25 and 30 years of age. Results showed that three-quarters of the participated residents suffered from anxiety and most of them had mild (32%) and moderate anxiety (33%).

Conclusion: The COVID-19 pandemic affected the family medicine residents' program, the change that happened in their rotation and exam date affected the family residents psychologically. It is necessary to do a psychological intervention to improve the mental health of the family resident during the pandemic.

Keywords: COVID-19, anxiety, family medicine residents.

Introduction

On 31 December 2019, a pneumonia case of unknown cause was detected in Wuhan, China. As of early February 2020, the World Health Organization announced the new novel coronavirus to be the cause of COVID-19, which caused many countries around the world to prepare and increase their supplies to face COVID-19, which had a high infectious rate as compared to the other coronaviruses (MERS-CoV and SARS-CoV). The World Health Organization declared the novel coronavirus disease 2019 (COVID-19) outbreak as a global pandemic on March 11, 2020 [1], with almost around 97.9 million confirmed cases worldwide along with a global cumulative death toll of 1.75 million people till December 2020. Saudi Arabia reported 361,903 confirmed cases in December 2020, while in Eastern Mediterranean, Saudi Arabia ranked second in the confirmed cases of COVID-19 [2]. However, coping with the pandemic and mental health is no less important and these may result in long-term negative impacts. Aside from the side effects the disease can cause, this pandemic imposed enormous pressure on the government, ministry of health and healthcare providers, and the general public. The isolation measures, academic delays, large number of patients, and fear of side effects and death reportedly have an influence on the mental health for the general population [3-6].

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On the other hand, the general population was not the only ones facing psychological distress as a result of this pandemic. Healthcare providers face the pressure of diagnosing, isolating, and treating patients, who are affected by this pandemic as well as the fear of being infected with the virus and passing it on to loved ones and family members. Along with trainees including residents, interns and students might face difficulty as they have to cope with pandemic, and this might also affect the academic year schedules [7-9].

Many studies have reported the difficulties faced by healthcare providers, who deal with COVID-19 patients as front liners [7-9]. Therefore, this study aimed to assess the effect of the ongoing epidemic on the family medicine residents in Riyadh city, Saudi Arabia.

Subjects and Methods

This study was a cross-sectional survey of multicenter hospitals in Saudi Arabia conducted between 8th of July and 8th of September, 2020. The target population of this study was registered residents in family medicine Saudi Board Program. According to Saudi Commission for Health Specialties, there were 1,566 family medicine residents as of 2019 [10]. This study included 349 family medicine residents. Sample size was calculated using Raosoft sample size calculator with a 10% margin of error and a 95% confidence interval.

An anonymous online self-administered English questionnaire was used. The questionnaire consisted of three main sections including questions about demographic data, generalized anxiety disorder (GAD-7) scale, stressors, and concerns about COVID-19. The GAD-7 scale was used to assess the level of anxiety in the included family medicine residents during COVID-19 pandemic. The GAD-7 scale includes seven items based on seven main symptoms and inquires the frequency with which participants suffered from any of these symptoms during the last 2 weeks [11]. Participants reported their symptoms using a 4-item Likert rating scale ranging from 0 (not at all) to 4 (almost every day), with a total score ranging from 0 to 21. Cut-off values of 0, 5, 10, and 15 were used to define no anxiety, mild, moderate, and severe, respectively.

Statistical analysis was carried out using Statistical Package for Social Studies.

Result

A total of 349 family medicine residents completed the questionnaire. Out of 349 participants, 52.1% of the residents were male, 75% were between 25 and 30 years of age. Regarding the place of residency, 47% of them were in the central region. Moreover, 29% were in PGY1 and 28.6 in PGY4. Additionally, around three-quarters of the residents were not smokers (Tables 1 and 2).

Results showed that three-quarters of the participated residents suffered from anxiety and most of them had mild (32%) and moderate anxiety (33%) Figure 1.

There was strong statistical correlation between the concern about academic delays due to COVID-19 pandemic, the impact of COVID-19 on daily life, and their family members getting infected by COVID-19; their level of anxiety was measured on the GAD-7 scale (Table 3).

There was significant statistical strong correlation between the GAD-7 score and a history of contact with an individual with suspected COVID-19 infection, having a relative, household or colleague who died from COVID-19, being concerned about academic delays due to COVID-19 pandemic, the impact of COVID-19 on their daily life (*p*-value = 0.000), and being concerned for having a family member getting infected by COVID-19 with for each of these factors (*p*-value = 0.001). There was also statistically significant correlation among GAD-7 anxiety score range and having a relative, household or colleague infected with COVID-19, and facing a shortage

Table 1. *Demographic features of residents by postgraduate year (PGY).*

Residency year	Gender		Age groups				Region		
	Female	Male	25-30	31-35	36-40	≥41	Central region	Eastern region	Western region
PGY1	51	51	93	9	0	0	38	36	28
	14.6%	14.6%	26.6%	2.6%	0.0%	0.0%	10.9%	10.3%	8.0%
PGY2	42	56	80	15	3	0	75	15	8
	12.0%	16.0%	22.9%	4.3%	0.9%	0.0%	21.5%	4.3%	2.3%
PGY3	24	37	40	16	5	0	19	28	14
	6.9%	10.6%	11.5%	4.6%	1.4%	0.0%	5.4%	8.0%	4.0%
PGY4	50	38	50	34	2	2	32	33	23
	14.3%	10.9%	14.3%	9.7%	0.6%	0.6%	9.2%	9.5%	6.6%
Total	167	182	263	74	10	2	164	112	73
	47.9%	52.1%	75.4%	21.2%	2.9%	0.6%	47.0%	32.1%	20.9%

Table 2. *Demographic features of residents (by region).*

	Gender		Age groups				Smoking		
	Female	Male	25-30	31-35	36-40	≥41	Ex-Smoker	Not smoker	Smoker
Central region	78	86	149	11	4	0	11	126	27
% of Total	22.3%	24.6%	42.7%	3.2%	1.1%	0.0%	3.2%	36.1%	7.7%
Eastern region	61	51	62	42	6	2	0	88	24
% of Total	17.5%	14.6%	17.8%	12.0%	1.7%	0.6%	0.0%	25.2%	6.9%
Western region	28	45	52	21	0	0	4	38	31
% of Total	8.0%	12.9%	14.9%	6.0%	0.0%	0.0%	1.1%	10.9%	8.9%
Count	167	182	263	74	10	2	15	252	82
% of Total	47.9%	52.1%	75.4%	21.2%	2.9%	0.6%	4.3%	72.2%	23.5%

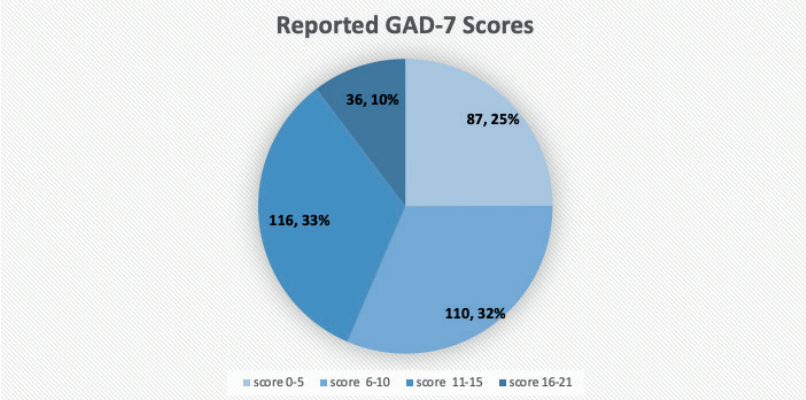

Figure1. *Distribution of the GAD7 score among family medicine residents.*

Table 3. *Correlation between concerns and severity of the anxiety among residents (N = 349).*

Area of concern		Range				Total	*p* value
		0-4	5-9	10-14	15-21		
The academic delays due to COVID-19 pandemic	No	36	9	16	4	65	.000
	%	10.3%	2.6%	4.6%	1.1%	18.6%	
	Yes	46	76	122	40	284	
	%	13.2%	21.8%	35.0%	11.5%	81.4%	
The impact of COVID-19 on daily life	No	31	11	9	2	53	.000
	%	8.9%	3.2%	2.6%	0.6%	15.2%	
	Yes	51	74	129	42	296	
	%	14.6%	21.2%	37.0%	12.0%	84.8%	
Family members getting Infected by COVID-19	No	5	8	0	0	13	.001
	%	1.4%	2.3%	0.0%	0.0%	3.7%	
	Yes	77	77	138	44	336	
	%	22.1%	22.1%	39.5%	12.6%	96.3%	

in personal protective equipment (PPE) in hospital during the pandemic (*p*-value = 0.005).

However, there was statistically significant correlation between the GAD-7 anxiety score range and diagnosis with COVID-19 (*p*-value = 0.682), history of contact with an individual with confirmed COVID-19 infection (*p*-value = 0.013), or having a relative, household or colleague who developed severe complications of COVID-19 (*p*-value = 0.042). All the seven elements in the GAD-7 score had a very strong statistical correlation and the score range (*p*-value= .000) for each of them (Table 4).

Table 4. *Correlation between severity of anxiety and exposure to COVID-19 among residents (N = 349).*

Factor compared to GAD-7 score range		Range				DF		
		0-4	5-9	10-14	15-21	X^2		*p*-value
Diagnosis with COVID-19	No	73	77	126	42	1.502	3	0.682
	%	20.9%	22.1%	36.1%	12.0%			
	Yes	9	8	12	2			
	%	2.6%	2.3%	3.4%	0.6%			
History of contact with an individual with confirmed COVID-19 infection	I don't know	26	36	39	9	16.238	6	0.013
		7.4%	10.3%	11.2%	2.6%			
	No	24	23	25	12			
		6.9%	6.6%	7.2%	3.4%			
	Yes	32	26	74	23			
	%	9.2%	7.4%	21.2%	6.6%			
History of contact with an individual with suspected COVID-19 infection	I don't Know	33	24	16	9	45.837	6	0.000
		9.5%	6.9%	4.6%	2.6%			
	No	17	12	9	10			
		4.9%	3.4%	2.6%	2.9%			
	Yes	32	49	113	25			
	%	9.2%	14.0%	32.4%	7.2%			
Having a relative, household or colleague infected with COVID-19	I don't Know	2	4	2	5	18.559	6	0.005
		0.6%	1.1%	0.6%	1.4%			
	No	30	22	30	6			
		8.6%	6.3%	8.6%	1.7%			
	Yes	50	59	106	33			
		14.3%	16.9%	30.4%	9.5%			
A relative, household or colleague who developed severe complications of COVID-19	Count	32	26	32	11	17.470	9	0.042
			7.4%		3.2%			
	I don't know	32	31	43	15			
	%	9.2%	1.4%	12.4%	1.1%			
	No	42	38	72	26			
		12.0%	10.9%	20.6%	7.4%			
	Yes	8	16	23	3			
	%	2.3%	4.6%	6.6%	0.9%			
A relative, household or colleague who died from COVID-19	Count	32	26	32	11	32.144	9	0.000
	%	9.2%	7.4%	9.2%	3.2%			
	I don't know	0	2	12	0			
		0.0%	0.6%	3.4%	0.0%			
	No	44	39	83	30			
		12.6%	11.2%	23.8%	8.6%			
	Yes	6	18	11	3			
	%	1.7%	5.2%	3.2%	0.9%			
Being concerned about academic delays due to COVID-19 pandemic	No	36	9	16	4	45.332	3	0.000
	%	10.3%	2.6%	4.6%	1.1%			
	Yes	46	76	122	40			
	%	13.2%	21.8%	35.0%	11.5%			
Being concerned about the impact of COVID-19 on your daily life	No	31	11	9	2	44.815	3	0.000
	%	8.9%	3.2%	2.6%	0.6%			
	Yes	51	74	129	42			
	%	14.6%	21.2%	37.0%	12.0%			

Continued

Factor compared to GAD-7 score range		Range				DF		
		0-4	5-9	10-14	15-21	X^2		*p*-value
Being concerned about your family members getting infected by COVID-19	No	5	8	0	0	15.994	3	0.001
	%	1.4%	2.3%	0.0%	0.0%			
	Yes	77	77	138	44			
	%	22.1%	22.1%	39.5%	12.6%			
Facing any shortage in PPE in your hospital during the pandemic	I don't know	4	6	20	9	18.763	6	0.005
	%	1.1%	1.7%	5.7%	2.6%			
	No	20	34	43	7			
	%	5.7%	9.7%	12.3%	2.0%			
	Yes	58	45	75	28			
	%	16.6%	12.9%	21.5%	8.0%			

DF: Degree of freedom.

There was strong statistical correlation between the GAD-7 score and the residents' gender (*p*-value = 0.000), age (*p*-value = 0.000), marital status (*p*-value = 0.002), year in the residency program (*p*-value = 0.000), having a chronic medical condition (*p*-value = 0.000), having a psychological or mental illness (*p*-value = 0.000), and the involvement with confirmed or suspected COVID-19 cases (*p*-value = 0.001). On the other hand, there was no statistically significant correlation between the GAD-7 score and the residents' region in Saudi Arabia, smoking, and the involvement as frontline staff dealing with suspected or confirmed COVID-19 cases (Table 5).

Discussion

This study aimed to assess the anxiety level among family medicine residents during the COVID-19 pandemic. It was found that 182 out of 349 (52.1%) of the family medicine residents had scored more than 9 in the GAD-7 score, which indicated moderate to severe anxiety. The residents were psychologically affected by the changes in their program's rotations and residency exams date together with some of them dealing with COVID-19 patients. In another cross-sectional study conducted in medical students to evaluate anxiety and depression disorders during COVID-19 pandemic, they found 46.17% of the students scored more than 9 in GAD-7 score [12]. While a cross-sectional study conducted in China reported that only 24.2% of the health workers suffered from psychological symptoms during the COVID-19 pandemic [13]. Another meta-analysis study found that 31.9% of the general population had anxiety [14]. In another study, 13.9% had severe anxiety during the COVID-19 pandemic in the general Saudi population [15]. Another systematic review found that 46% of the health workers during SARS pandemic had anxiety, as other combined studies were conducted during influenza and coronavirus found that 45% of the health workers had anxiety [16].

In the present study, feeling nervous, anxious or on edge was seen more in female residents as compared to male residents, where female residents were more susceptible to have more severe feelings and for longer duration. The same was found in a study conducted in Copenhagen university hospital, Denmark, their results were that female gender was a risk factor for psychiatric symptoms among healthcare workers [17]. Moreover, male gender was found to have a more severe and longer duration of not being able to stop or control worrying. Another study conducted in China reported that women had more severe symptoms of anxiety, depression, and distress [18].

Another finding in the present study indicated that residents who dealt with confirmed COVID-19 cases were more at risk to gain the feeling of worrying too much about different things. This result was similar to Wuhan study finding, which found that working as frontline healthcare worker with direct engagement of patients with COVID-19 was an independent risk factor [18].

There was a significant association between having depression and feeling afraid as if something awful might happen. Same behavior was seen in a study about health workers in China, during the COVID-19 pandemic that had high prevalence rates of severe insomnia, anxiety, depression, somatization, and obsessive-compulsive symptoms [19].

In the present study, male gender was positively associated with feeling afraid as if something awful might happen. This finding was in contrast to a cross-sectional study conducted in Wuhan, where the female gender was positively associated with anxiety symptoms [20].

The current study did not find any relation between smoking or non-smoking and the feeling of being afraid. Another study conducted in the Western Pomerania region in Poland, found a relationship between smoking and the risk of having anxiety symptoms [21].

A significant proportion of residents who directly dealt with confirmed COVID-19 cases had more severe feelings of anxiety symptoms in the current study, which was similar to Poland cross-sectional study, where symptoms

Table 5. *Correlation between severity of the anxiety and demographic features of residents, previous medical conditions, and involvement with COVID-19 cases (N = 349).*

Demographic features			GAD-7 score range				X^2	df	*p*-value
			0-4	5-9	10-14	15-21			
Gender	Female	Count	32	18	91	26	45.917[a]	3	0.000
		%	9.2%	5.2%	26.1%	7.4%			
	Male	Count	53	64	47	18			
		%	15.2%	18.3%	13.5%	5.2%			
Age	25-30	Count	52	62	114	35	32.076[a]	9	0.000
		%	14.9%	17.8%	32.7%	10.0%			
	31-35	Count	33	15	20	6			
		%	9.5%	4.3%	5.7%	1.7%			
	36-40	Count	0	5	2	3			
		%	0.0%	1.4%	0.6%	0.9%			
	More than 41	Count	0	0	2	0			
		%	0.0%	0.0%	0.6%	0.0%			
Marital status	Divorced	Count	4	3	1	0	20.670[a]	6	0.002
		%	1.1%	0.9%	0.3%	0.0%			
	Married	Count	36	43	74	10			
		%	10.3%	12.3%	21.2%	2.9%			
	Single	Count	45	36	63	34			
		%	12.9%	10.3%	18.1%	9.7%			
Year in the residency program	PGY1	Count	17	32	34	19	35.562[a]	9	0.000
		%	4.9%	9.2%	9.7%	5.4%			
	PGY2	Count	29	30	31	8			
		%	8.3%	8.6%	8.9%	2.3%			
	PGY3	Count	20	8	32	1			
		%	5.7%	2.3%	9.2%	0.3%			
	PGY4	Count	19	12	41	16			
		%	5.4%	3.4%	11.7%	4.6%			
5. Region in Saudi Arabia	Central region	Count	40	32	66	26	4.983[a]	6	0.546
		%	11.5%	9.2%	18.9%	7.4%			
	Eastern region	Count	28	31	43	10			
		%	8.0%	8.9%	12.3%	2.9%			
	Western region	Count	17	19	29	8			
		%	4.9%	5.4%	8.3%	2.3%			
6. With whom does the resident currently live	Alone	Count	21	20	17	8	19.698[a]	9	0.020
		%	6.0%	5.7%	4.9%	2.3%			
	Other	Count	0	0	3	2			
		%	0.0%	0.0%	0.9%	0.6%			
	With family	Count	64	62	112	32			
		%	18.3%	17.8%	32.1%	9.2%			
	With friends	Count	0	0	6	2			
		%	0.0%	0.0%	1.7%	0.6%			
7. Chronic medical conditions	Allergic Rhinitis	Count	1	0	0	0	96.609[a]	48	0.000
		%	0.3%	0.0%	0.0%	0.0%			
	Asthma	Count	3	10	5	8			
		%	0.9%	2.9%	1.4%	2.3%			
	depression and anxiety	Count	0	0	1	0			
		%	0.0%	0.0%	0.3%	0.0%			

Continued

Demographic features			GAD-7 score range				X^2	df	*p*-value
			0-4	5-9	10-14	15-21			
	Diabetes	Count	0	0	2	3			
		%	0.0%	0.0%	0.6%	0.9%			
	DLP	Count	0	0	0	1			
		%	0.0%	0.0%	0.0%	0.3%			
	GERD and heart burn increase with stress	Count	1	0	0	0			
		%	0.3%	0.0%	0.0%	0.0%			
	Hypertension	Count	0	0	0	2			
		%	0.0%	0.0%	0.0%	0.6%			
	Hypothyroidism	Count	1	0	0	0			
		%	0.3%	0.0%	0.0%	0.0%			
	IgA nephropathy	Count	1	0	0	0			
		%	0.3%	0.0%	0.0%	0.0%			
	Migraine headache	Count	0	0	1	0			
		%	0.0%	0.0%	0.3%	0.0%			
	Migraine headache	Count	0	0	0	1			
		%	0.0%	0.0%	0.0%	0.3%			
	none	Count	1	0	0	0			
		%	0.3%	0.0%	0.0%	0.0%			
	None	Count	76	72	126	27			
		%	21.8%	20.6%	36.1%	7.7%			
	Post-sleeve gastrectomy 1yr4mon	Count	0	0	0	1			
		%	0.0%	0.0%	0.0%	0.3%			
	Rheumatological diseases	Count	0	0	3	0			
		%	0.0%	0.0%	0.9%	0.0%			
	SCD	Count	1	0	0	0			
		%	0.3%	0.0%	0.0%	0.0%			
8. Previous diagnosis with any psychological or mental illnesses	ADHD, Anxiety	Count	0	0	0	1	42.537[a]	15	0.000
		%	0.0%	0.0%	0.0%	0.3%			
	Anorexia	Count	0	0	0	1			
		%	0.0%	0.0%	0.0%	0.3%			
	Anxiety and depression	Count	1	0	0	0			
		%	0.3%	0.0%	0.0%	0.0%			
	Anxiety disorder	Count	9	1	10	0			
		%	2.6%	0.3%	2.9%	0.0%			
	Depression	Count	10	0	11	8			
		%	2.9%	0.0%	3.2%	2.3%			
	None	Count	65	81	117	34			
		%	18.6%	23.2%	33.5%	9.7%			
9. Smoking cigarette, e-cigarette or shisha	Ex-Smoker	Count	4	0	11	0	11.931[a]	6	0.064
		%	1.1%	0.0%	3.2%	0.0%			
	No	Count	60	59	97	36			
		%	17.2%	16.9%	27.8%	10.3%			
	Yes	Count	21	23	30	8			
		%	6.0%	6.6%	8.6%	2.3%			

Continued

Demographic features			GAD-7 score range				X^2	df	*p*-value
			0-4	5-9	10-14	15-21			
10. Involvement as *frontline* staff dealing with suspected or confirmed COVID-19 cases	No	Count	41	42	49	16	7.137[a]	3	0.068
		%	11.7%	12.0%	14.0%	4.6%			
	Yes	Count	44	40	89	28			
		%	12.6%	11.5%	25.5%	8.0%			
11. Involvement as backline staff dealing with confirmed or suspected COVID-19 cases	No	Count	11	20	39	2	15.636[a]	3	0.001
		%	3.2%	5.7%	11.2%	0.6%			
	Yes	Count	74	62	99	42			
		%	21.2%	17.8%	28.4%	12.0%			

of anxiety, depression, and insomnia, prevailed over 90% in the group of employees who had direct contact with persons suspected or infected with SARS-CoV-2 [21].

In the present study, there were several limitations. First, the current study was only limited to the family medicine residents. However, assessing the anxiety among the other specialty residents during the pandemic needs further investigations. Also, future studies could include all health workers and not only residents. Lastly, the study was only limited to the central, eastern, and western regions.

Conclusion

The current study showed that during the COVID-19 pandemic more than half of the family medicine residents, who were included in the study, suffered from moderate to severe anxiety. Level of anxiety of the family medicine residents significantly associated with some factors such as gender, age, marital status, having a medical illness, and dealing with COVID-19 cases. Female residents were associated with having severe anxiety for a longer duration, while male residents had a longer duration for the inability to control their worrying. The COVID-19 pandemic affected the family residents' program, the change that happened in their rotation and exam date affected the family residents psychologically. It is necessary to do a psychological intervention to improve the mental health of the family medicine residents during the pandemic.

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Conflict of interests
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Consent to participate
Informed consent was obtained from the participants.

Ethical approval
This research was approved by the Institutional Review Board of the medical research center, Imam Mohammad ibn Saud Islamic University (48-2020) dated 21-6-2020.

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References

1. Cucinotta D, Vanelli M. WHO declares COVID-19 a pandemic. Acta Bio Medica: Atenei Parmensis. 2020;91(1):157.
2. World Health Organization. WHO coronavirus disease (COVID-19) dashboard; 2020 [cited 2021 Jan]. Available from: https://covid19.who.int
3. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. Int J Environ Res Public Health. 2020;17(5):1729. https://doi.org/10.3390/ijerph17051729
4. Haider II, Tiwana F, Tahir SM. Impact of the COVID-19 Pandemic on Adult Mental Health. Pak J Med Sci. 2020;36(COVID19-S4). https://doi.org/10.12669/pjms.36.COVID19-S4.2756
5. Otu A, Charles CH, Yaya S. Mental health and psychosocial well-being during the COVID-19 pandemic: the invisible elephant in the room. Int J Ment Health Syst. 2020;14(1):1–5. https://doi.org/10.1186/s13033-020-00371-w
6. Ćosić K, Popović S, Šarlija M, Kesedžić I. Impact of human disasters and Covid-19 pandemic on mental health: Potential of digital psychiatry. Psychiatr Danubina. 2020;32(1):25–31. https://doi.org/10.24869/psyd.2020.25
7. Tsamakis K, Rizos E, Manolis AJ, Chaidou S, Kympouropoulos S, Spartalis E, et al. [Comment] COVID-19 pandemic and its impact on mental health of healthcare

professionals. Exp Ther Med. 2020;19(6):3451–3. https://doi.org/10.3892/etm.2020.8646

8. Taylor L. Psychological stress of COVID-19 frontline healthcare workers: rational safety behaviors, evidence-based self-help interventions, and remote mental health support. Psychosociol Issues Hum Resour Manag. 2020;8(1):61–6. https://doi.org/10.22381/PIHRM81202010
9. Hou T, Zhang T, Cai W, Song X, Chen A, Deng G, et al. Social support and mental health among health care workers during Coronavirus Disease 2019 outbreak: a moderated mediation model. PLos One. 2020;15(5):e0233831. https://doi.org/10.1371/journal.pone.0233831
10. Training statistics; 2019. Available from: https://www.scfhs.org.sa/MESPS/Pages/statistics.aspx
11. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch Intern Med. 2006;166(10):1092–7. https://doi.org/10.1001/archinte.166.10.1092
12. Sartor CI, Spinardi FB, State SP, Zip B. 1 - Botucatu Medical School, São Paulo State University, UNESP. Botucatu, Brazil 2- Educational Foundation of Municipatility of Assis, FEMA Medical School. Assis, Brazil 3 - The Faculty of Medicine of the University of São Paulo, FMUSP. Sao Paulo, Brazil. 2020;1–20.
13. Wang H, Huang D, Huang H, Zhang J, Guo L, Liu Y, et al. The psychological impact of COVID-19 pandemic on medical staff in Guangdong, China: a cross-sectional study. Psychol Med. 2020:1–9. https://doi.org/10.1017/S0033291720002561
14. Salari N, Hosseinian-Far A, Jalali R, Vaisi-Raygani A, Rasoulpoor S, Mohammadi M, et al. Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-analysis. Global Health. 2020;16(1):57. https://doi.org/10.1186/s12992-020-00589-w
15. Alkhamees AA, Alrashed SA, Alzunaydi AA, Almohimeed AS, Aljohani MS. The psychological impact of COVID-19 pandemic on the general population of Saudi Arabia. Compr Psychiatry. 2020;102:152192. https://doi.org/10.1016/j.comppsych.2020.152192
16. Muller RA, Stensland RS, van de Velde RS. The mental health impact of the covid-19 pandemic on healthcare workers, and interventions to help them: a rapid systematic review. Psychiatry Res. 2020:113441. https://doi.org/10.1016/j.psychres.2020.113441
17. Vindegaard N, Benros ME. COVID-19 pandemic and mental health consequences: systematic review of the current evidence. Brain Behav Immun. 2020;89:531–42. https://doi.org/10.1016/j.bbi.2020.05.048
18. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. JAMA Netw Open. 2020;3(3):e203976. https://doi.org/10.1001/jamanetworkopen.2020.3976
19. Zhang WR, Wang K, Yin L, Zhao WF, Xue Q, Peng M, et al. Mental health and psychosocial problems of medical health workers during the COVID-19 epidemic in China. Psychother Psychosom. 2020;89(4):242–50. https://doi.org/10.1159/000507639
20. Zhou Y, Wang W, Sun Y, Qian W, Liu Z, Wang R, et al. The prevalence and risk factors of psychological disturbances of frontline medical staff in china under the COVID-19 epidemic: Workload should be concerned. J Affect Disord. 2020;277:510-514. doi: 10.1016/j.jad.2020.08.059.
21. Wańkowicz P, Szylińska A, Rotter I. Assessment of mental health factors among health professionals depending on their contact with COVID-19 patients. Int J Environ Res Public Health. 2020;17(16):5849. https://doi.org/10.3390/ijerph17165849