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Factors associated with mental health burdens in physical therapists during the late stage of the COVID-19 pandemic

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Abstract

Introduction. It has been a long time since the emergence of COVID-19 in China and its spread worldwide. Vaccines are a promising solution to overcome COVID-19 infection. Still, vaccine hesitancy is the only barrier to controlling the pandemic, as thinking about its side effects induces psychological exhaustion. There is still a lack of research targeting the mental health of Physical Therapists (PTs), especially during the late stage of the COVID-19 pandemic, so the study's main aim was to identify the prevalence of anxiety, depression and insomnia and identify risk factors that influence anxiety and depression.
Methods. A cross-sectional online survey via anonymous questionnaires and questions about socio-demographic information was launched on social media in the second half of February 2021.
Results. Prevalence of anxiety, depression, and insomnia was 42.7%, 50.10%, and 89.30%, respectively, among physical therapists. Common factors that induce anxiety and depression were having children and needing psychological support. Other risk factors for anxiety only were working in a quarantine hospital, being infected with COVID-19, self-isolation after return from the hospital, and hesitance about vaccine effectiveness. Treating COVID-19 patients and having a family member who had died from COVID-19 were risk factors for depression. Consulting a psychiatrist reduced this risk of depression.
Conclusions. Elevated mental health disturbances triggered the alarm for urgent psychological rehabilitation to prevent the failure of health care systems in this critical period. Additionally, fighting the anti-vaccine movement should be a priority along with enhancing telerehabilitation programs in hospitals.
Key words: mental illness, physical therapist, vaccine hesitance, anti-vaccine movement

Introduction

Since COVID-19 emerged in China and spread worldwide, it has attracted global awareness [1]. This unique biodisaster is related to anxiety, depression, and insomnia [2]. Health care workers (HCWs) were at the highest risk of infection and death over other populations, negatively influencing their mental status and affecting productivity. Recent studies recommend regular screening the mental health of HCWs who are involved in diagnosing and treating COVID-19 patients [3, 4].

Despite multiple studies concerning mental illness among medical professionals during the early stages of the COVID-19 pandemic [2, 5, 6], few focused on physical therapists' (PTs) mental status [7, 8]. No studies discussed PTs' mental health during the chronic phase of COVID-19, especially during the period of COVID-19 vaccine availability for the human population. Previous studies illustrated that medical teams, particularly those working in emergency units, intensive care units, and infectious disease wards, are at higher risk for adverse psychiatric events [9]. They are vulnerable to being infected more rapidly and carrying it to their families, which will threaten their lives; this puts them at psychological risk and risks sleep disturbances, which are more pronounced than for the rest of the medical community.

Even as countries make global protective efforts to prevent the spread of the infection, vaccines are one of the most reliable and cost-effective public health interventions to save the lives of millions of people [10]. In January 2021, the Egyptian health ministry approved COVID-19 vaccines. The World Health Organization (WHO) declared that vaccine hesitancy is one of the barriers to world health. Vaccine hesitancy also affects healthcare workers [11]. A low confidence level of its effectiveness and the fear of its side effects causes this hesitancy [11, 12]. Previous studies showed variability in resistance or hesitancy to accept the COVID-19 vaccine [13]. These factors could further induce psychological overload (anxiety, depression, and insomnia) within PTs, negatively affecting their decision-making and productivity in dealing with physically disabled patients.

Therefore, the main aim of the study was to identify the prevalence of anxiety, depression, and insomnia during the late stage of COVID-19 (period of vaccine availability for human use) among physical therapists. The second objective was to recognise the risk factors influencing anxiety and depression.

We hypothesise that the above factors will negatively affect psychological well-being rather than the onset of COVID-19.

Subjects and methods

Study design

PTs played an integrated role during the COVID-19 pandemic; their responsibilities in an intensive care unit (ICU)

and inpatient rehabilitation settings enhanced the rapid and adequate discharge of COVID-19 patients and outpatient service to ensure care for persons with residual functional disabilities [14].

The inclusion criteria for this study were as follows:

1 – Egyptian PTs only who were living or working in Egypt during this pandemic.

2 – Have Facebook or WhatsApp and accepted to participate in this study.

The exclusion criteria were as follows:

1 – PTs with psychiatric illness.

2 –PTs who refused to participate in the study.

A survey used convenience sampling and was distributed to the participants and collected in the second half of February 2021. The guided online link lead to several questions about socio-demographic information plus three different questionnaires to assess anxiety, depression, and sleep quality, with a consent form, and was designed by authors using Google forms. The link was launched on social media such as Facebook and WhatsApp groups specialised for Egyptian PTs. All survey questions and consent forms were in English and followed the tenets of the Declaration of Helsinki.

By opening the link, the PTs found the study's aims, questions of whether they lived or worked in Egypt during the pandemic, and if they want to participate in this study or not. By clicking OK, they accepted participating in our research. After that, different questions appeared. It took only 10–15 minutes to finish all questions. After completing all questions, the PTs clicked OK to submit their answers. All data saved and collected on the Google website was linked to the first author's email address.

Sampling

The sample size was calculated using the Epi Info™ 7 software, Version: 7.2.6. Based on a previous study performed in Egypt about mental health among healthcare workers, the sample size was 502 contributors [5]; at a 99.9% confidence interval, the calculated sample size was 323 participants. The expected frequency of insomnia was 70%, and the confidence limit was 5%.

Methods

We implemented a questionnaire consisting of three parts: Assessment of the socio-demographic characteristics included (age, gender, having children, marital status, and presence of any chronic diseases, smoking status, and nature of work. In addition, treating COVID-19 patients in isolation hospitals, being infected with COVID-19, having relatives die from COVID-19, wearing Personal Protective Equipment (PPE) at work and thinking about the need for psychological support. Also included were thinking that social media negatively affects your psychological status, having family members have chronic diseases, consulting a psychiatrist or not, performing self-isolation after returning from the hospital, performing regular exercise, intention to take the COVID-19 vaccine or not, thinking about vaccine efficacy, getting sufficient information about the COVID-19 vaccine, and source of information about the COVID-19 vaccine.

We focused on anxiety, depression, and insomnia symptoms for all PTs using English versions of three validated questionnaires widely used as screening tools [15–17].

Measurement of anxiety

We checked for the presence of anxiety, which was measured using the Generalised Anxiety Disorder scale (GAD-7) over the previous14 days. This questionnaire is used in clinical practice and research due to its diagnostic reliability and efficiency [15]. It was developed by Spitzer et al. for screening in primary care settings [18]. It has a sensitivity of 74% and a specificity of 54%. Cronbach's alpha of this scale was 0.83 [15]. It includes seven items ranging from zero (Not at all sure) to three (nearly every day). The entire score varies from 0 to 21, with subscale scores fluctuating from (0–4) for normal, (5–9) mild, (10–14) moderate, to (15–21) for severe anxiety [15]. This study used 10 points or above to indicate generalised anxiety symptoms [15].

Measurement of depression

The 9-item Patient Health Questionnaire (PHQ-9) was used to assess depression over the previous two weeks. It was introduced by Kroenke et al. in 2001 [19]. It is the 9-question depression scale of the PHQ, which is part of Pfizer's larger suite of trademarked products, called the Primary Care Evaluation of Mental Disorders (PRIME-MD). It includes nine items ranging from zero (Not at all) to three (Nearly every day). It is a fast depression measurement tool that uses10 points as the cut points for depression [16], with a scale subdivided from (0–4) for normal, (5–9) for mild, (10–14) for moderate, to (15–27) for severe depression [16]. Scores > 10 had a sensitivity of 88% and a specificity of 88%. Cronbach's alpha of this scale was 0.89. This scale was used for healthcare workers during COVID-19 in Egypt.

Measurement of sleep quality

The 9-item Pittsburgh Sleep Quality Index (PSQI) questionnaire is a self-administered questionnaire used to assess the subject's sleep quality over the past two weeks using an 18-item scale with a score value of 0to 21, where higher scores represent poorer sleepers [17]. It was developed in 1988 by Buysse and his colleagues to measure information about the subjective nature of people's sleep habits, and provides a clear index that both clinicians and patients can use [20]. The PSQI scale contains seven components (subjective sleep quality, duration, latency, habitual sleep efficiency, use of sleep medications, sleep disturbance, and daytime dysfunction). The score for each component ranges from 0 to 3 points. This scale was used for medical participants in earlier studies in China [21]. A score > 5 yields a sensitivity of 89.6% and a specificity of 86.5%. Cronbach's alpha for this scale was 0.83. A participant with a score of less than 5 indicates a good sleeper, while an elevated PSQI score indicates insomnia [17].

Statistical analysis

Data on socio-demographic features were summarised using descriptive statistics. Categorical variables, such as number (n) and percentage (%), were used to the describe data. Spearman's test was used to determine the association between socio-demographic characteristics and anxiety and depression. A multivariate logistic regression test was used to determine risk factors for anxiety and depression. SPSS version 20 (Armonk, NY, IBM Corp) was used to analyse all the data. The adjusted odds ratio (ORa) and 95% confidence interval were calculated. Statistical significance was defined as a p-value < 0.05.

Ethical approval

The research related to human use has complied with all the relevant national regulations and institutional policies, has followed the tenets of the Declaration of Helsinki, and has been approved by the Faculty of Physical Therapy, Beni-Suef University (approval No.: BSUPT 1.1.2021).

Informed consent

Informed consent has been obtained from all individuals included in this study. All participants accepted an online informed consent to participate in the study before completing the questionnaire.

Results

Approximately 365 graduated PTs throughout all governorates in Egypt completed our survey. About two-thirds of the sample were women, and one-third were men, at 72.1% and 27.9%, respectively. Nearly half of the participants (50.1%) were aged 20–30. About a third of the participants treated COVID-19 patients, and 40.3% had been infected with COVID-19 themselves. Around a third of the participants (38.4%) had at least one relative who had died from COVID-19. A large percentage (74.5%) wear PPE in their work, while more than half (54.8%) think they need psychological support. About 88.5% of PTs think social media negatively

Table 1. Socio-demographic data of the participants

Variables		n	%
Age	20–30	183	50.1
	30–40	149	40.8
	40–50	33	9.0
Gender	women	263	72.1
	men	102	27.9
Do you have children?	no	186	51.0
	yes	179	49.0
Marital status	single	179	49.0
	married	177	48.5
	widow	3	0.8
	divorced	6	1.6
Do you have a chronic disease?	no	315	86.3
	yes	50	13.7
Type of chronic disease?	DM	11	3.0
	HTN	19	5.20
	IHD	7	1.90
	epilepsy	5	1.40
	asthma	4	1.10
	lymphatic tumour	2	0.50
	HIV	2	0.50
Are you a smoker?	no	314	86.0
	yes	51	14.0
Nature of work	outpatients	206	56.4
	staff member	33	9.0
	isolation hospital	48	13.2
	inpatient	78	21.4
Do you treat COVID-19 patients in isolation hospitals?	no	235	64.4
	yes	130	35.6
Have you been infected with COVID-19?	no	144	39.5
	yes	147	40.3
	maybe	74	20.3

Variables		n	%
Do you have any relatives who died from COVID-19?	no	225	61.6
	yes	140	38.4
Do you wear PPE at your work?	no	93	25.5
	yes	272	74.5
Do you think that you need psychological support?	no	165	45.2
	yes	200	54.8
Do you think that social media negatively affects your psychological status?	no	42	11.5
	yes	323	88.5
Do you have family members who have a chronic disease?	no	111	30.4
	yes	254	69.6
Have you consulted a psychiatrist recently?	no	342	93.7
	yes	23	6.3
Do you perform self--isolation after returning from the hospital?	no	209	57.3
	yes	156	42.7
Do you perform regular exercise?	no	269	73.7
	yes	96	26.3
Do you intend to take the COVID-19 vaccine?	no	81	22.2
	yes	96	26.3
	hesitated	188	51.5
Do you think vaccination will be effective?	no	41	11.2
	yes	81	22.2
	may be	243	66.6
Do you have sufficient information about the COVID-19 vaccine?	no	296	81.1
	yes	69	18.9
Source of information about the COVID-19 vaccine	social media	167	45.8
	television	72	19.7
	colleges	117	32.1
	others	9	2.5

DM – diabetes mellitus
IHD – ischemic heart disease
HTN – hypertension
HIV – human immunodeficiency virus
PPE – personal protective equipment

Table 2. Prevalence of anxiety, depression, and insomnia among Egyptian PTs during the late stage of COVID-19

Scale	Mean ± *SD*	Variables	*n*	%
GAD_7 scale	9.8 ± 5.49	no anxiety anxiety	209 156	57.30 42.70
GAD_7 subscales		no anxiety mild moderate severe	69 140 88 68	18.90 38.40 24.10 18.60
PHQ_9 scale	10.93 ± 6.69	no depression depression	182 183	49.90 50.10
PHQ_9 subscales		normal mild moderate severe	55 127 78 105	15.10 34.80 21.40 28.80
(PSQI) scale	9.97 ± 4.49	no insomnia insomnia	39 326	10.70 89.30
Minutes to fall asleep each night		< 15 16–30 31–60 > 60	35 66 74 190	9.60 18.10 20.30 52.10

GAD_7 – General Anxiety Disorder questionnaire
PHQ_9 – Patient Health Questionnaire
PSQI   – Pittsburgh Sleep Quality Index

affects their psychological status and 81.5% do not have sufficient information about vaccine efficacy. More than half 51.5% were hesitant to take the COVID-19 vaccine, while 66.6% doubted the vaccine's effectiveness.

The prevalence of anxiety was 42.7%, with 18.6% suffering from severe anxiety. Nearly half of the participants had depression (50.10%) with 28.8% suffering from severe depression.

The prevalence of insomnia among the participants was 89.3%, and few (10.7%) were sleeping soundly. With an analysis of the required duration to fall asleep every day, we found that more than half (52.1%) took more than one hour, a fifth (20.3%) took from half an hour to an hour, and almost another fifth (18.1%) took more than15 minutes to less than half an hour. A distinct minority (9.6%) took less than 15 minutes to fall asleep (see Table 2).

Table 3 illustrates the association between socio-demographic data and the anxiety and depression scales using the Spearman test.

Our results demonstrated a common significant positive correlation between these factors with anxiety and depression, respectively. It includes treating COVID-19 patients $p = (0.211^{**}) (0.254^{**})$, being infected with COVID-19 $p = (0.272^{**}) (0.157^{**})$, need for psychological support $p = (0.404^{**}) (0.378^{**})$, family members had a chronic disease $(0.159^{**}) (0.194^{**})$, and getting sufficient information about vaccine intake $(0.114^{*}) (0.103^{*})$.

Table 3. Association between socio-demographic data and both anxiety and depression scales

Variables	Anxiety	Depression
Gender	−0.063	−0.069
Age	0.018	−0.033
Do you have children?	−0.055	−0.088
Marital status	−0.021	0.091
Do you have a chronic disease?	0.114*	0.039
Are you a smoker?	0.081	0.122*
Nature of work	0.060	−0.013
Do you treat COVID-19 patients?	0.211**	0.254**
Have you been infected with COVID-19?	0.272**	0.157**
Do you have any relatives who died from COVID-19?	0.077	0.097
Do you wear (personal protective equipment) PPE at your work?	0.033	0.107*
Do you think that you need psychological support?	0.404**	0.378**
Do you believe that social media negatively affects your psychological status?	0.048	0.079
Do you have family members who have a chronic disease?	0.159**	0.194**
Have you consulted a psychiatrist recently?	0.073	−0.010
Do you perform self-isolation after returning from the hospital?	−0.157**	−0.130*
Do you perform regular exercise?	−0.039	−0.026
Do you intend to take the COVID-19 vaccine?	−0.109*	−0.144**
Do you think vaccination will be effective against COVID-19?	−0.115*	−0.220**
Do you have sufficient information about the COVID-19 vaccine?	0.114*	0.103*
Source of information about the COVID-19 vaccine	−0.096	−0.105*

* Spearman correlation is significant at the level of 0.05 (2-tailed).
** Spearman correlation is significant at the level of 0.01 (2-tailed).

While having a chronic disease only correlates with anxiety (0.114*), both being a smoker (0.122*) and wearing PPE at work (0.107*) positively correlate with depression only.

The common factors that are negatively associated with anxiety and depression were performing self-isolation after returning from the hospital (–0.157**) (–0.130*), intending to take the vaccine (–0.109*) (–0.144**), and thinking the vaccine will be effective against COVID-19 (–0.115*) (–0.0220**). In contrast, the results showed that the source of information about COVID-19 (–0.105*) only negatively correlated with depression.

In a multivariate logistic regression to demonstrate factors more likely to contribute to the development of anxiety, those with children were 2.5 times more likely to experience anxiety than participants with no children, working in an isolation hospital or inpatient unit, personal experience of infection with COVID-19, need for psychological support, performing self-isolation after returning from the hospital, while the highest level of anxiety was reported by participants who were hesitant about the effectiveness of the vaccine; they reported a 5-times higher anxiety level (Table 4).

Table 4. Demonstrated risk factors of anxiety and depression

Variables	OR	Anxiety 95% CI. lower	Anxiety 95% CI. upper	p-value	OR	Depression 95% CI. lower	Depression 95% CI. upper	p-value
Gender (man)	1.41	0.762	2.633	0.270	1.340	0.716	2.506	0.360
Do you have children (yes)	2.50	1.39	4.501	0.002*	2.243	1.24	4.038	0.007*
Do you have a chronic disease (yes)	1.00	0.430	2.360	0.987	1.064	0.479	2.365	0.879
Are you a smoker (yes)	0.784	0.343	1.790	0.563	0.540	0.239	1.220	0.138
Nature of work				0.005*				0.280
Working in isolation hospital	0.328	0.164	0.652	0.001*	0.587	0.304	1.136	0.114
Working a staff member	1.07	0.341	3.358	0.907	0.374	0.120	1.170	0.091
Working in inpatient units	0.391	0.154	0.995	0.049*	0.760	0.287	2.012	0.580
Do you treat COVID-19 patients (yes)	0.668	0.338	1.322	0.247	0.256	0.122	0.537	0.000*
Have you been infected with COVID-19				0.000*				0.332
(yes)	0.198	0.091	0.431	0.000*	0.632	0.297	1.342	0.232
(maybe)	0.415	0.187	0.922	0.031*	0.576	0.259	1.283	0.177
Do you have any relatives who died from COVID-19 (yes)	0.477	0.274	0.832	0.009*	0.484	0.273	0.856	0.013*
Do you wear PPE at your work (yes)	1.78	0.899	3.542	0.098	0.746	0.375	1.484	0.404
Do you think that you need psychological support (yes)	0.243	0.138	0.429	0.000*	0.222	0.126	0.394	0.000*
Do you believe that social media negatively affects your psychological status (yes)	2.17	0.941	5.007	0.069	1.890	0.821	4.352	0.135
Do you have family members who have a chronic disease (yes)	0.712	0.377	1.344	0.295	0.837	0.455	1.539	0.567
Have you consulted a psychiatrist recently (yes)	0.714	0.212	2.411	0.588	10.73	2.63	43.69	0.001*
Do you perform self-isolation after returning from the hospital (yes)	2.04	1.16	3.610	0.013*	1.145	0.653	2.008	0.637
Do you perform regular exercise (yes)	0.673	0.360	1.256	0.213	0.696	0.364	1.330	0.273
Do you intend to take the vaccine				0.195				0.555
(yes)	1.25	0.598	2.646	0.546	1.050	0.505	2.182	0.896
(hesitant)	0.583	0.258	1.319	0.195	1.536	0.689	3.425	0.294
Do you think vaccination will be effective against COVID-19				0.005*				0.161
(yes)	0.897	0.321	2.510	0.836	1.073	0.403	2.855	0.888
(hesitated)	5.00	1.79	13.96	0.002*	2.565	0.967	6.803	0.058
Do you have sufficient information about the COVID-19 vaccine (yes)	2.09	0.835	5.233	0.115	0.693	0.292	1.646	0.406
Source of information about COVID-19vaccine				0.026*				0.222
(television)	0.931	0.043	20.31	0.964	0.590	0.091	3.816	0.580
(colleges)	0.281	0.012	6.321	0.424	0.299	0.043	2.094	0.224
(others)	0.716	0.033	15.57	0.831	0.332	0.051	2.153	0.248

CI – confidence interval, PPE – personal protective equipment

In contrast, factors significantly contributing to the development of depression were treating COVID-19 patients, the presence of family relatives who died from COVID-19 infection, not consulting a psychiatrist, and need psychological support. All were statistically significant at $p < 0.005$.

Discussion

Our results revealed a high percentage of mental health symptoms at the late stage of COVID-19 during the period of vaccine availability for human use. Overall, 42.7%, 50.1%, and 89.3% of our participants reported anxiety, depression, and insomnia symptoms, respectively. Our results were much higher than the anxiety reported (12.5%) among medical staff in China during earlier phases of the COVID-19 pandemic [2]. Besides results of a recent systematic review reported that anxiety was 36.92% and insomnia was 36.72% despite using similar questionnaires [22] and were higher than the reported results among PTs, where the overall anxiety and depression were 32.3% and18.5%, respectively. However, no difference in scales was used to assess anxiety and depression in our study and this one [8]. Our results were consistent with the results of a study performed in China on medical team who treated COVID-19 patients, in which about 44.6% had anxiety and 50.4% had depression [15], and research performed in Argentina among medical staff during this pandemic, where anxiety, depression and insomnia were 76.5%, 81.0%, and 84.7%, respectively [23]. A high percentage of mental health problems within such a medical team in the late phase of COVID-19 is an alarming situation where the medical team is part of the first-line defence during the crisis. Fast access to psychological support during this crucial period and regular follow-ups on mental health are required, as we do not know when COVID-19 will disappear from the world. Previous studies show that psychiatric morbidity might still be significant even after recovering from SARS [24]

Risk factors in common between anxiety and depression

Identifying and managing contributing factors for anxiety and depression is the best way to solve this global headache. Our results showed that the need for psychological support was a common risk factor for anxiety and depression. Our results are constituent with previous results that social support is a significant protective factor for reducing anxiety and stress, improving self-efficacy and coping under this stress [25]. Motivations to eliminate negative thinking and online psychological support could assist these pandemics by enhancing their positive behaviours. Psychological support is necessary through different routes, including family, friends, consultation with a psychiatrist, motivation lectures, and regular vacations to uplift this negative mood. The inner feelings of the participants that they require urgent psychological care were an alarm during this period, indicating that they were psychologically overloaded. Recent studies confirmed that Internet-based integrated interventions focusing on relaxation, self-care, and raising the sense of personal safety have significantly reduced depression and anxiety symptoms in COVID-19 patients [26].

Risk factors for anxiety

Having children was a risk factor for anxiety, as family safety was the primary concern for all participants. Our results align with previous studies among PTs and demonstrated

that having a child resulted in a higher risk of anxiety [8]. The results of a prior study reported that a large percentage of pregnant females had depression and anxiety during the COVID-19 pandemic [27]. According to the results of a recent systematic review, it is hard for children to become infected with COVID-19; they accounted for only 1–5% of reported cases of COVID-19 [28]. They have milder COVID-19 symptoms than adults, with a very low incidence of death. Still, in the case of being infected, it is hard for them to be in self-isolation without their caregivers, who usually spend most of their time in the hospital or stay for several days in isolation hospitals, which induces even more worries.

Our results showed that working in an isolation hospital in an ICU and inpatient unit was a risk factor for anxiety. The exaggerated anxiety level might be due to our participants not having enough training to deal with COVID-19 cases, work overload and staying away from their families for a long time. Our results are consistent with previous studies that not being ready to work in a quarantine hospital significantly predicts stress, and being female could also significantly predict anxiety [6]. Furthermore, the working nature of PTs close to infected persons during rehabilitation made them more vulnerable to becoming infected, despite most of our participants wearing PPE during work. There is little evidence supporting the effectiveness of face masks in reducing the risk of COVID-19 infection [13, 28]. Evidence supports the continuous use of airborne precautions in the hospital wards. This puts healthcare workers at a higher risk of infection [29]. Our participants were extra alert about their behaviour, which also induces further anxiety and worry. Anxiety, in turn, increases work pressure sensitivity and negatively affects self-efficacy [30].

Our results illustrated that personal infection experience with COVID-19 induced a risk of anxiety. Our results match previous studies that reported that infection with COVID-19 evokes significant emotional stress [31]. In addition to the side effects of medical treatments, social isolation, fear of infecting others, and stigma were potential factors for anxiety. The virus is transmitted mainly through respiratory droplets found on beds, toilets, and personal items, such as cell phones. The presence of the virus in the surrounding environment heightens anxiety levels [32]. In turn, chronic stress provokes the simultaneous inhibition and boost of the immune response by changing the cytokine expression pattern, which induces immunosuppressive consequences [33]. Previous studies demonstrated that survivors with post-COVID syndrome have increased suicide attempts, while others without post-COVID syndrome may also be at elevated suicide risk [34]. However, attempting suicide is not common in Egyptian culture for religious reasons. Further studies are required to identify if there are thoughts of suicide among Egyptian medical workers or not?

Our results demonstrated that self-quarantine or mandatory loneliness after returning from the hospital deleteriously contributes to anxiety. Our results matched with the results of a recent systematic review. Social isolation and loneliness amplified the risk of depression, with mild-to-moderate associations with anxiety ($0.18 \leq r \leq 0.54$). These mental health problems may extend up to 9 years after the events that induced them [35]. However, our study was performed more than a year after the WHO declared COVID-19 the pandemic. Longitudinal follow-up of the mental health of PTs is required as the length of loneliness appears to predict future mental health problems [33]. Recent studies reported that being in contact with COVID-19 patients and taking sleep medication during the mandatory social isolation were relevant predictors for insomnia, anxiety, and depression [23].

Although our results showed no significant association between self-isolation and depression or insomnia, further studies are required to identify this relationship.

Our results demonstrated that hesitance about vaccine efficacy was a risk factor for anxiety. Our results matched a previous study performed in Egypt among medical teams where half of the participants were hesitant, and the majority did not have sufficient information about the COVID-19 vaccine [36]. Although the COVID-19 vaccine is the best solution to overcome this global nightmare, if it is accepted by people, hesitance is still the dominant barrier to world health. Being willing to take the COVID-19 vaccine is related to a higher level of its effectiveness at the population level [37]. An international study in low- and middle-income countries demonstrated the lowest acceptance rate for receiving COVID-19 vaccine in African countries [37]. Despite Egypt being the largest and most populous country in Africa based on the COVID-19 vaccination tracker, updated on 13 July 2021, only about 1.2% of the whole population was vaccinated, which seems to be the lowest vaccine uptake rate of all countries. This situation may be explained by the anti-vaccine movement, which claims the vaccine is more dangerous than the disease by involving vaccines with other illnesses. The COVID-19 anti-vaccine trend looks fuelled by fabricated theories, mistaken views, and a lack of confidence in vaccine policies, safety and efficacy [36]. This may further extend the duration, morbidity and mortality of the COVID-19 pandemic, leading to further exacerbation of this health crisis and an ever bigger drop in mental health status of the population. In Egypt, taking the vaccine is still optional. The vaccine hesitancy model can be modulated through education about the vaccine and psycho-social interventions. Fighting the anti-vaccine movement within the medical team is the target, as they have an influential role in persuading the public about the importance of the vaccine. Societies should also monitor social media to change the anti-vaccine movement to increase vaccine acceptance by the community [38].

Risk factors for depression

Treatment of COVID-19 patients was a risk factor for depression. Our results are supported by previous studies that nurses, women, frontline health care workers, and those working in Wuhan, China, reported more severe degrees of all measurements of mental health symptoms [15], while the results of a previous study showed that a medical team working in a fever hospital was at a higher risk of severe depression [5]. Patients during the early phases of rehabilitation require complete assistance of PTs, especially those hospitalised in ICUs or inpatient clinics, and patients with neurological manifestations obligate PTs to be in close contact with infected persons.

Applying new, innovative modalities, such as telerehabilitation, could protect PTs from infection and, in turn, decrease the physical and mental burden on the PTs.

Consulting a psychiatrist was negatively associated with a reduced risk of depression by ten times over those participants who did not consult a psychiatrist. Evaluation and management by a consultation-liaison psychiatrist remain the gold standard. Our results suggest the need for systematic psychiatric screening for individuals diagnosed with or treated for COVID-19 and whether they had attempted suicide or not. Based on previous studies, individuals suffering from depression are at a 25 times greater risk of suicide than the general population [39]. Quick treatment of mental health status is therefore warranted.

Our results demonstrated that the existence of a family member who died from COVID-19 was also a risk factor for depression. The sudden loss of a beloved one and never seeing them again prolonged a person thinking of death threatening to take their own life. Corona virus-related death is unexpected, and this grief characteristic may lead to difficulty accepting this new reality [40].

Limitations

First, an online cross-sectional self-reported is susceptible to over- and underestimation of the results. Second, it included only people who had access to social media, meaning there is a lack of data about participants working in ICUs in quarantine hospitals who may have had limited access to social media during this pandemic or whose work overload that made it difficult to reach them. In addition, elderly PTs generally have less access to social media than younger people. Third, we used the GAD_7, PHQ_9 and PSQI questionnaires, which may underestimate our results due to their psychometric properties. Fourth, we only studied anxiety, depression, and insomnia and did not study suicide attempts or thoughts, as suicide itself is rare in Egypt due to the population's religious background, which inhibits such attempts. Fifth, it is hard to generalise our results for all medical teams as we specify only PTs.

Conclusions

High rates of anxiety, depression, and insomnia were presented within Egyptian PTs. Having children, working in isolation hospitals and inpatient units, personal experience of COVID-19, an inner feeling of the need for psychological support, self-isolation after returning from the hospital, hesitance about vaccine efficacy, treatingCOVID-19 patients, and existence of a relative who died from COVID-19 are associated with adverse psychological symptoms. At the same time, consulting a psychiatrist positively affected PTs' psychological well-being. Beyond proper rest during working hours, psychological support is also important. Regular exercise is an integral part of a healthy lifestyle, as it is the best predictor of mental and physical health. The Ministry of health should enhance telerehabilitation programs, primarily in isolation hospitals.

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