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Psychological distress among primary health care workers during COVID-19 pandemic: a cross-sectional study in Mansoura, Egypt

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Abstract

Background The COVID-19 pandemic is putting a lot of pressure on primary healthcare (PHC) workers globally. The study aimed to estimate the level of psychological distress among PHC workers during the current COVID-19 pandemic and its associated factors in Mansoura, Egypt.

Methods A cross-sectional study on 415 PHC workers was implemented using self-administered questionnaire. The questionnaire included socio-demographic, work-related data, and Arabic COVID-19 Psychological Distress Scale. Multiple logistic regression analysis was used to identify significant predictors of psychological distress.

Results More than half (53.3%) of PHC workers had high psychological distress. Multiple logistic regression showed that the significant predictors of high distress level were Para-medical PHC staff (AOR = 1.6; 95% CI 1.0–2.6), smoking (AOR = 3.6; 95% CI 1.4–9.5), having or suspected corona infection (AOR = 3.4; 95% CI 1.5–7.8), afraid from contracting corona (AOR = 7.4; 95% CI 3.6–15.3), worry about family (AOR = 2.6; 95% CI 1.0–6.9), worry at the beginning of the pandemic (AOR = 4.1; 95% CI 2.1–8.4), non-practice of sport (AOR = 1.8; 95% CI 1.1–2.9), and non-training to deal with corona cases (AOR = 1.9; 95% CI 1.1–3.3).

Conclusions High psychological distress level was observed among PHC workers. Psychological support and timely programs should be planned to alleviate stress among PHC workers especially at-risk groups during the current pandemic.

Keywords COVID-19, Distress, Health workers, Pandemic, Egypt

Background

Coronavirus disease 2019 (COVID-19) has infected humans, Causing extraordinary numbers of deaths and significant psychological disturbance [1].

COVID-19 pandemic hurts people's psychological well-being. Anxiety and depression can be brought on by the fear of infection itself as well as the lack of effective antiviral medication and vaccinations at an earlier stage of the pandemic [2].

Pandemics can also trigger a massive international medical response, with thousands of healthcare workers (HCWs) being placed in a precarious position on the frontlines. To name a few, there is pathogen exposure; long working hours; psychological discomfort; tiredness; burnout; stigma; and both [3, 4]

During pandemics, primary health care (PHC) personnel play a critical role in public health response, infection control, and risk management, as well as continued provision of health services for ongoing or acute health conditions unrelated to the pandemic [5]. This overburden PHC staff [6].

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A study conducted amongst Australian PHC workers at COVID-19 found stress-inducing workplaces, job insecurity, and insufficient resources to be important contributors to PHC workers' mental health and well-being [5].

An immense stress was created from the general public on PHC workers as a result of COVID-9. Inadequate protection, loss of control, and a lack of experience are all frequent issues. Managing the disease, being overworked, and obtaining negative feedback from patients, stigmatization, significant lifestyle changes, quarantine, and a lack of Family support has been linked to psychological problems with regard to the pandemic [7].

Many previous researches explored the effect of COVID-19 on mental health status of health care workers in hospital including a previous Egyptian study [8] that found higher stress level among sample of health care providers, but as far as we know, there is a scarcity of studies that examine the psychological distress experienced by PHC employees during the pandemic in Egypt. Hence, this study aimed to estimate the level of psychological distress among PHC workers during the COVID-19 pandemic and its associated factors in Mansoura, Egypt.

Methods

Study design

This cross-sectional study was conducted over eight months (January 2022–August 2022).

Setting and target population

This study was conducted in PHC centers, Mansoura District, Egypt. Mansoura Health Administration includes 54 PHC facilities (42 ruraland 12 in urban). A systematic random sample of nine PHC facilities (2 urban and 7 rural) were taken from the list of 54 facilities. All cadres of health care workers of the chosen facilities on duty were targeted in the study with a response rate of 100%.

Sample

The sample size was calculated using G power (http://www.ats.ucla.edu/ stat/ g power) with the following assumptions: prevalence of severe distress among PHC physicians was 55.4% from a recent Egyptian study [9], with an effect size of 0.1, 5% precision and power of 99%. The calculated size was to be at least 392.

Data collection

The data collected by face to face predesigned questionnaire prepared by the researcher during the study period to collect:

Socio-demographic and Corona-related data

Age, sex, marital status, occupation, education, residence, chronic diseases, smoking, having children, having corona or suspected infection, afraid of contracting the Corona virus, worried about family from contracting the Corona virus, time of worry about the corona virus, and doing sports.

Work-related status of PHC workers

Working hours per week, duration of work, pervious contact with Corona patients in the work environment, training to deal with Corona cases, availability of personal protective equipment, and taking corona vaccine.

Arabic COVID-19 Psychological Distress Scale (CPDS) [10]

The initial version of the CPDS included 30 items divided into two sub-scales: physiological (e.g., shortness of breath; headache) and emotional (e.g., fear; anxiety) to be answered on a five-point Likert-type intensity scale, as follows: (1) no, (2) a little, (3) moderate, (4) much, and (5) very much. The final tool included 12 items answered on a five-point Likert-type intensity scale, as follows: (1) no, (2) a little, (3) moderate, (4) much, and (5) very much. These items were analyzed using median as a cutoff point for the level of distress, being < 2.5 presented as low level of psychological distress and ≥ 2.5 as high level of it [11]. The Cronbach alpha of this tool in this study was 0.89.

Statistical analysis

Data were collected, coded, and analyzed using IBM SPSS version 26 (Armonk, NY: IBM Corp.). No missing data were detected. Data were tested for normality using the Kolmogorov–Smirnov test. Quantitative data were summarized as mean and standard deviation for normally distributed data and median for non-parametric ones. Qualitative data were summarized as number and percent. A chi-square test was done for comparison of categorical variables. Bivariable analysis was performed to find out factors contributing to psychological distress. Crude odds ratios (OR) and their 95% confidence interval (CI) were calculated. Significant associations in bivariable analysis were entered into a multivariable binary logistic regression model to identify the independent predictors of psychological distress. Adjusted odds ratios (AOR) and their 95% confidence interval were calculated. *P* value ≤ 0.05 was considered statistically significant.

Results

Table 1 shows that 37.6%, 33.5%, 29.9%, and 32.8% of participants were preoccupied with the idea of being infected by corona virus, worried for health, felt tense

Table 1 Distribution of COVID-19 Psychological Distress Scale according to subjective severity

Items	No *N* (%)	little *N* (%)	Moderate *N* (%)	Much *N* (%)	Very much *N* (%)
I am afraid of being infected with coronavirus	118(28.4)	109(26.3)	109(26.3)	58(14)	21(5.1)
I am preoccupied with the idea of being infected by Coronavirus	109(26.3)	91(21.9)	156(37.6)	47(11.3)	12(2.9)
I am worried for my health because of the coronavirus Outbreak	106(25.5)	82(19.8)	139(33.5)	62(14.9)	26(6.3)
I am afraid to even think about going out into the streets because of the coronavirus	152(36.6)	94(22.7)	127(30.6)	29(7.0)	13(3.1)
I have heart palpitations when I hear of a case of coronavirus Infection	97(23.4)	137(33)	126(30.4)	38(9.2)	17(4.1)
I feel tense and anxious for my family since the outbreak of Coronavirus	69(16.6)	104(25.1)	124(29.9)	62(14.9)	56(13.5)
I hardly sleep from thinking so much about being infected by Coronavirus	146(35.2)	110(26.5)	124(29.9)	24(5.8)	11(2.7)
I shudder from fear of being infected with the coronavirus	130(31.3)	113(27.2)	125(30.1)	30(7.2)	17(4.1)
I feel short of breath when I hear news about coronavirus	128(30.8)	114(27.5)	136(32.8)	24(5.8)	13(3.1)
I am preoccupied with the idea that the end of the world is near because of the outbreak of coronavirus	134(32.3)	107(25.8)	130(31.3)	37(8.9)	7(1.7)
My head aches when I receive news about new cases of coronavirus infection	141(34)	117(28.2)	129(31.1)	17(4.1)	11(2.7)
I have become more afraid of death	170(41.0)	70(16.9)	139(33.5)	26(6.3)	10(2.4)
Total score: mean ± SD	2.32 ± 0.74				
Levels of distress:					
Low (< 2.5)	194(46.7%)				
High(≥ 2.5)	221(53.3%)				

and anxious for family, and felt shortness of breath when hearing corona news respectively. While the least of them reported fear from being infected with corona virus, had heart palpitations when hearing of a case of corona virus infection, had hardly sleep from thinking about being infected by corona, and reported fear from death. Moreover, the prevalence of severe distress about the pandemic of COVID-19 was 53.3%.

Table 2 shows that higher significant odds ratio of severe distress was among para- medical PHC staff (clerks, technicians, supervisors) (COR = 1.5), smokers (COR = 2.9), had or suspected corona infection (COR = 3.2), afraid from contracting corona infection (COR = 8.3), worried about family (COR = 11.3), worried at the beginning of the pandemic (COR = 4.4), and those not practicing sports (COR = 2.03).

Table 3 shows that those previously contacted with corona cases in work (COR = 1.7), not trained to deal with corona cases (COR = 1.6), and had not available PPE or had and not used it (COR 1.8) had significantly higher odds ratio of severe distress.

Table 4 shows that the significant independent predictors of severe psychological distress among PHC workers were para-medical PHC staff (AOR = 1.6), smoking (AOR = 3.6), having or suspected corona infection (AOR = 3.4), afraid from contracting corona (AOR = 7.4), worry about family (AOR = 2.6), worry at the beginning of the pandemic (AOR = 4.1), non-practice of sport (AOR = 1.8), and non-training to deal with corona cases (AOR = 1.9).

Discussion

Health care workers (HCWs) in primary health care during a pandemic were more vulnerable to anxiety and stress due to overburdened health care systems and fear of contracting the infection, causing significant short- and long-term psychological impact.

The current study showed that the prevalence of severe psychological distress among PHC workers was 53.3% during the current pandemic of COVID-19. This result is similar to a previous study in Egypt (55.4%) [9]. However, previous studies handled the psychological distress of PHC workers in Greece (67%) [13], South Africa (97.5%) [14], and Saudi Arabia (25.4%) [15]. The higher level of stress among these PHC workers is likely due to the fact that they were under enormous pressure from the general population as a result of the COVID-19 pandemic in Egypt, as well as dealing with suspected or confirmed COVID-19 cases from the community and fellow coworkers. When providing medical care during an infectious outbreak, healthcare workers are stressed about becoming infected or infecting others in their household, according to research [16].

The present study showed that about third of PHC workers experienced moderate sleep disorders due to COVID-19 pandemic. Such result is consistent with a previous Greek study [13]. Front-line workers are the most vulnerable to this situation, as they have unusually high levels of insomnia [17].

The current study's bivariate analysis revealed that younger PHCWS were more distressed than older ones.

Table 2 Socio-demographic characters of studied primary health care workers

Factors	Total	Severe distress *N* (%)	Significance	COR (95% CI)
Overall	415	221(53.3%)		
Age				
< 40	194	105(54.1)	$\chi 2 = 0.11$	1.1(0.7–1.6)
≥ 40	221	116(52.5)	$P = 0.7$	*r*(1)
Sex				
Male	106	57(53.8)	$\chi 2 = 0.02$	*r* (1)
Female	309	164(53.1)	$P = 0.9$	0.9 (0.6–1.5)
Marital status				
Married	345	184(53.3)	$\chi 2 = 0.01$	1.02(0.6–1.7)
Single/divorced/widow	70	37(52.9)	$P = 0.9$	*r* (1)
Occupation				
Doctors/dentists/pharmacists/nurse	170	80(47.1)	$\chi 2 = 4.43$	*r* (1)
Others*	245	141(57.6)	$p = 0.04$	1.5 (1.02–2.26)
Residence				
Rural	338	179(53)	$\chi 2 = 0.06$	*r* (1)
Urban	77	42(54.5)	$p = 0.9$	1.1(0.6–1.8)
Education				
< Secondary	13	8(61.5)	$\chi 2 = 0.4$	1.4(0.4–4.4)
≥ Secondary	402	213(53)	$p = 0.6$	*r*(1)
Chronic diseases				
Yes	93	50(53.8)	$\chi 2 = 0.01$	1.03(0.6–1.6)
No	322	171(53.1)	$p = 1$	*r* (1)
Smoking				
Yes	36	27(75)	$\chi 2 = 7.4$	2.9(1.3–6.2)
No	379	194(51.2)	$p = 0.008$	*r* (1)
Having children				
Yes	323	169(52.3)	$\chi 2 = 0.5$	*r* (1)
No	92	52(56.5)	$p = 0.5$	1.2(0.7–1.9)
Having or suspected corona				
Yes	54	41(75.9)	$\chi 2 = 12.8$	3.2(1.6–6.1)
No/Do not know	361	180(49.9)	$p \leq 0.001$	*r*(1)
Afraid from contracting corona				
Yes	297	198(66.7)	$\chi 2 = 75.5$	8.3(4.9–13.8)
No	118	23(19.5)	$p \leq 0.001$	*r*(1)
Worry about family				
Yes	343	212(61.8)	$\chi 2 = 75.5$	11.3(5.4–23.5)
No	72	63(12.5)	$p \leq 0.001$	*r*(1)
Time of worry				
At the beginning of pandemic	353	206(58.4)	$\chi 2 = 24.7$	4.4(2.4–8.2)
After some time	62	15(24.2)	$p \leq 0.001$	*r*(1)
Practicing sports				
Yes	184	80(43.5)	$\chi 2 = 12.7$	r (1)
No	231	141(61)	$p = 0.001$	2.03(1.4–3.01)

COR crude odds ratio, *CI* confidence interval

* Clerks/Raeda/health supervisors/Technician

* Raeda is a female member of the community health workers chosen by the communities, accountable to the needs and priorities of the communities, and supported by the health system. She provides health education, preventive care, home visits, follow-up procedures, and timely referrals of cases requiring advanced health care facilities [12]

Table 3 Work-related status of studied primary health care workers

Factors	Total	Severe distress *N* (%)	Significance	COR (95% CI)[a]
Overall	415	212(53.3)		
Working hours per week				
< 40	189	104 (55)	$\chi2 = 0.44$	1.1(0.8–1.7)
≥ 40	226	117(51.8)	$p = 0.5$	*r*(1)
Duration of work (years)				
< 15	194	107 (55.2)	$\chi2 = 0.53$	1.2(0.8–1.7)
≥ 15	221	114(51.6)	$p = 0.5$	*r* (1)
Previous contact with corona cases in work				
Yes	293	167(57)	$\chi2 = 5.61$	1.7 (1.1–2.6)
No	122	54(44.3)	$p = 0.02$	*r* (1)
Training to deal with corona cases				
Yes	107	48 (44.9)	$\chi2 = 4.08$	*r* (1)
No	308	173(56.2)	$p = 0.05$	1.6(1–2.5)
Availability of PPE[b]				
All available and used	70	30(42.9)		*r* (1)
Some available and used	133	70(52.6)	$\chi2 = 1.8, p = 0.2$	1.5(0.8–2.7)
Not available/available and not used	212	121(57.1)	$\chi2 = 4.3, p = 0.04$	1.8(1.0–3.1)
Taking COVID-19 vaccine				
Yes	106	52(49.1)	$\chi2 = 1.01$	*r* (1)
No	309	169(54.7)	$p = 0.4$	1.3(0.8–2.0)

[a] *COR* crude odds ratio, *CI* confidence interval

[b] *PPE* personal protective equipment

This could be explained by the young being exposed to social media, which transmits a large amount of information about the pandemic, some of which is necessary, while some is disturbing, compared to the older, who can manage their stress due to better knowledge about the pandemic. This is similar to previous studies [18, 19].

Being a female HCW increases vulnerability for distress due to hormonal changes which amplify the magnitude of stress responses, so it was expected a significant association between female HCWs and severe distress as reported in previous studies [20, 21]. But, the present study results reported non-significant association between female sex and distress. This is in line with previous studies [19, 22].

When compared to medical PHC providers, the multivariable analysis revealed that para-medical PHC providers (technicians, supervisors, clerks, and raeda) were a significant predictor of severe distress. Para-medical staff may have less medical knowledge about COVID-19, less advanced training on personal protective equipment and infection control measures, and the majority of them did not receive the COVID-19 vaccine. This is similar to previous research [23, 24].

The current study found that smoking significantly predicts a high level of distress among PHC workers. This is consistent with previous research [25, 26]. These findings may have clinical implications because smoking is a modifiable risk factor. Thus, risk reduction strategies centered on smoking cessation may be beneficial in reducing the potentially negative effects of COVID-19 on the mental health of PHC workers.

The present study showed that the majority of PHC workers had or suspected corona infection were severely distressed versus those with no or do not know about corona infection. This is in line with previous study conducted in Saudi Arabia [15]. This could be explained by their fear from the complications of corona.

Moreover, the current study reported fear from contracting corona infection was a significant predictor for severe distress. This is similar to previous study in South Africa [14] and Greece [13]. The possible explanation is their fear from spreading corona infection to their families.

The present study reported worrying about the family was a significant predictor for high stress among PHC workers. This is similar to previous studies [14, 27]. This indicating the critical need of support for PHC worker's mental health.

Furthermore, the current study reported that the worry of infection at the beginning of the pandemic

Table 4 Multiple logistic regression analysis of independent predictors severe distress among studied primary health care workers

Factors	β	*p*	AOR (95% CI)[a]
Occupation			
Doctors/dentists/pharmacists/nurse			*r* (1)
Others	0.5	0.05	1.6(1–2.6)
Smoking			
Yes	1.3	0.009	3.6(1.4–9.5)
No			*r* (1)
Having or suspected corona			
Yes	1.2	0.004	3.4(1.5–7.8)
No/do not know			*r* (1)
Afraid from contracting corona			
Yes			7.4(3.6–15.3)
No	2.0	≤ 0.001	*r* (1)
Worry about family			
Yes	1.0	0.04	2.6(1–6.9)
No			*r* (1)
Time of worry			
At the beginning of pandemic	1.4	≤ 0.001	4.1(2.1–8.4)
After some time			*r* (1)
Practicing sports			
Yes			*r* (1)
No	0.6	0.01	1.8(1.1–2.9)
Training to deal with corona cases			
Yes			*r* (1)
No	0.6	0.02	1.9(1.1–3.3)
Constant	2.96,	2.96,	2.96,
Model $\chi 2$	146.36, $p \leq 0.001$	146.36, $p \leq 0.001$	146.36, $p \leq 0.001$
% Correctly predicted	72.8%	72.8%	72.8%
-2 log like hood	427.192	427.192	427.192

[a] *AOR* adjusted odds ratio, *CI* confidence interval

significantly predicts high distress among PHC workers. This is in keeping with previous studies [28, 29]. The possible explanation is that at the beginning of the pandemic, there is no enough information about natural history of the disease, no available vaccine against it and PHC workers were not trained on precautionary measures.

According to the bivariate analysis, the majority of PHC workers were physically inactive. This is consistent with previous research [30]. Furthermore, PHC workers who did not participate in sports had a higher significant odds ratio of experiencing high levels of distress. Similarly, previous research supported the same conclusion [14, 26]. This could be the result of a national state of emergency during the epidemic, when gyms were closed and walking or running in public places was prohibited. As a result, it is critical to raise awareness about the various types of home exercises and their benefits to mental health.

The current study's bivariate analysis revealed that PHC workers who had previous contact with Corona cases experienced greater distress than those who had not, which is consistent with previous research [31, 32]. This is most likely due to their concern about infection, complications, and spreading it to their families.

Another finding of the current study is that non-training to deal with corona cases significantly predicts high distress levels, which could be explained by the fact that training and good hospital guidance relieve distress [33]. This is consistent with previous studies [34, 35].

In this study, insufficient precautionary measures were found to be significantly associated with a higher risk of severe distress among PHC workers. This is consistent with previous Nepalese research [36, 37]. This could be because a lack of precautionary measures, such as PPE, can lead to compromised working conditions, a sense of insecurity, and increased infection exposure. As a result, these findings call attention to the Egyptian government's

failure to provide adequate protective measures to reduce psychological burden among PHC workers.

Strengths and limitations

The strength of the current study lies in being the first Egyptian and Arab study to assess psychological distress among primary health care workers during COVID 19 pandemic, as well as its use for the first time, the Arabic COVID-19 Psychological Distress Scale, which was recommended for Arab use. But, there are some limitations: first, the inability to take the sample from all primary health care centers and therefore it cannot be generalized to the community. Secondly, the inherent limitation of cross-sectional study is unable to account for potential changes in psychological disorders over a longer period of time. Third, more studies are needed to explore the psychological disorders in healthcare workers of PHC settings during the COVID-19 pandemic and thereafter in Egypt. Despite the end of the peak of the pandemic, it was still ongoing during the data collection phase with the same preventive measures in all health care facilities. Also, there was a possibility for a recall bias. Finally, there were few studies on the level of psychological distress among PHC worker during the COVID-19 pandemic to compare with.

Conclusions

This study estimated the level of psychological distress among PHC workers during the COVID-19 pandemic and its associated factors in Mansoura, Egypt. High psychological distress level was observed among PHC workers. Psychological support and timely programs should be planned to alleviate stress among PHC workers especially at-risk groups during the pandemic.

Abbreviations

AOR	Adjusted odds ratio
CI	Confidence interval
COR	Crude odds ratio
COVID-19	Corona virus disease 2019
CPDS	COVID-19 Psychological Distress Scale
HCWs	Health care workers
IRB	Institutional Research Board
PHC	Primary health care
PPE	Personal protective equipment

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Authors' contributions

SH M contributed to the conception and design of the study; helped to acquire, analyze, and interpret the data; drafted the manuscript; and revised the manuscript for important intellectual content. AH helped in putting the design of the manuscript and revised it for important intellectual content. S M helped to collect the data. All the authors read, approved the manuscript, and consented to publish.

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Availability of data and materials

Data are available upon request from the corresponding author.

Declarations

Ethics approval and consent to participate

The proposal was approved by the Institutional Research Board (IRB), Faculty of Medicine—Mansoura University (Reference number R.21.08.1390.R1). Informed consent was obtained from all PHC workers who were willing to participate in the study after ensuring confidentiality.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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