Health anxiety to COVID-19 virus infection and its relationship to quality of life in a sample of health care workers in Egypt: a cross-sectional study

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Summary

Aim of the study: Healthcare workers (HCWs) are more prone to extraordinary fears of COVID – 19 virus infection. This study aimed to explore the frequency and predictors of health anxiety to COVID-19 virus infection among HCWs and identify its relationship to their quality of life (QOL).

Material and methods: A cross-sectional study was conducted among a sample of HCWs in hospitals of Sharkia Province, Egypt from June 30 to July 16, 2020. A total of 218 HCWs were interviewed using the short health anxiety inventory (SHAI), Symptom Check List-90-Revised (SCL-90-R), and The World Health Organization Quality of Life – BREF (WHOQOL-BREF).

Results: The frequency of health anxiety to COVID-19 virus among HCWs was 28%. Symptoms of depression, hostility, phobia and somatization, and history of chronic medical illnesses showed greater odds of health anxiety to COVID-19 virus (OR: 6.7, 9.1, 7.3, 7.7, and 12.6, respectively). Being physicians and the increased number of sleeping hours were less likely associated with health anxiety to COVID-19 virus (OR: 0.1 and 0.5, respectively). Health anxiety to COVID-19 virus was inversely correlated with all domains of QOL among HCWs.

Conclusions: Health anxiety to Covid-19 virus infection is common among HCWs, and it negatively affects their QOL.

Egypt, health anxiety to Covid-19, health care workers (hcws), quality of life (qol)

INTRODUCTION

In March 2020, the COVID-19 outbreak was declared by the World Health Organization as a global pandemic. Severe acute respiratory syndrome coronavirus-2 COVID-19 (SARS-CoV-2), which was a newly emerging virus, was recognized as the offending agent of COVID-19 virus infection that began first in December 2019 in Wuhan, China and spread worldwide [1]. Globally, as of 7 August 2020, there have been around 19 million confirmed cases of COVID-19, including about 710 thousand deaths, affecting more than two hundred Countries and Territories across the world [2].

The current COVID-19 pandemic put healthcare workers (HCWs) around the world under extraordinary pressures. First, ensuring the safety and efficient protection of HCWs from being infected during the epidemic was very essential not only to maintain continuous and safe patient care but also to control outbreaks.[3] It was documented that HCWs who were caring for patients during the previous outbreaks like severe acute respiratory syndrome (SARS) and the Middle East respiratory syndrome (MERS)

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were under persistent stress due to the increased risk of infection, stigmatization, deficient training, limited numbers of medical staff, deficient medical equipment and uncertainty [4, 5]. Second, the HCWs would have to make life-saving decisions under extreme pressures. These decisions included how to judiciously utilize the limited resources equally to patients, how to stabilize the balances between their own physical and mental wellbeing needs with those of their patients, and between their duty commitments to patients with those to their families and friends, and how to continue providing the medical care for all affected patients with limited or inadequate resources [6].

All these challenges may result in some to experience a wide array of psychological problems. It was stated that the HCWs were fearful, anxious, and frustrated and were at higher risk of emotional disturbances, during the last SARS and MERS epidemics [4, 5]. The situation would be the same during Covid-19 pandemic; studies have found that HCWs working with patients with COVID-19 have greater risks of psychiatric disturbances, such as anxiety, depression, insomnia, and stress [7-9]. The extraordinary circumstances of sustained fear and apprehension may negatively affect the quality of life (QOL) among HCWs [10]. Work-related risks in combination with psychological quests, ethical dilemmas, and the patients' demands can be a burden on the professional's emotional state [11]. Numerous studies reported that the reluctance to work or contemplating resignation was usually seen among HCWs who feared contagion [12]. Furthermore, sustained anxiety and tensions could lead to lower quality of care, which in its turn could lower professional satisfaction and consequently their QOL [13].

The HCWs including physicians, nurses, technicians, and health workers are working at the frontlines facing COVID-19 pandemic in Egypt, with a sustained risk of being infected. To our knowledge, there is no sufficient data regarding the psychosocial impact of the COVID-19 virus infection on the QOL among HCWs during the pandemic in Egypt. The current study aimed to identify the sociodemographic as well as the clinical factors associated with the health anxiety to Covid-19 infection and to identify its relationship with the QOL among HCWs in Egypt.

METHODS

Study Setting

The HCWs enrolled in this study, were working during the outbreak of the COVID-19 pandemic in the major three public hospitals in Sharkia Province, where separate isolation units were devoted to COVID-19 patients. Sharkia Province, located in the Eastern Nile Delta, is the 2nd most populated province in Egypt, after the Great Cairo region, with about 8.0 million inhabitants.

Study design and sampling

This is a cross-sectional study conducted during the period from June 30 to July 16, 2020. The study was performed during the peak of the COVID-19 epidemic outbreak in Egypt among HCWs including physicians, nurses, technicians, and health workers. A total of 218 HCWs from all ages and both sexes were randomly enrolled in this study, calculated according to the Epi Info 6.0, at 80% power of the study, 95% confidence level [14], as the total number of Egyptian HCWs who are currently working in the general hospitals in Sharkia Province is 41898 [15]. A systematic random sampling method was assigned by item selection from an ordered population utilizing a skip or sampling interval. The data were collected via telephone due to lockdown measures, and the local health authorities banned face-to-face contact.

Data collection and assessment measures

Exposure Ascertainment:

The main exposure variable was the health anxiety to COVID-19 virus infection among HCWs, assessed by the short health anxiety inventory (SHAI) [16]. The SHAI is an 18-item measure that contains two sections; the main section is a 14-item subscale evaluating the symptoms of health anxiety (hypochondriasis), and the second section is a 4-item subscale assessing people's attitudes to how awful it would be if they were to develop a particular illness (Covid-19 virus infection). Each SHAI item consists

of four responses rated from "0 to 3", and the total score ranges from 0 to 54. A cut-off of 27 was applied to differentiate between hypochondriacal health anxiety and normal anxiety reaction [17]. The SHAI has established comparable reliability and validity [18].

Outcome Ascertainment:

The primary outcome was the QOL of HCWs, measured by the World Health Organization Quality of Life – BREF (WHOQOL-BREF) [19]. The WHOQOL-BREF is a self-report questionnaire that contains a total of 26 questions assessing four domains of QOL namely; physical Health (7 items), psychological Health (6 items), social Relationships (3 items), and lastly environment (8 items). Besides, 2 items measure general health and overall QOL. Items scored 1-5, and the raw score of each domain is the sum of scores of its items. The mean of items within each domain is multiplied by four to yield the domain score (range 4–20); total domain scores are then normalized to a range of 0-100. Higher scores denote higher QOL.

Covariates:

Demographic and clinical variables and co-morbid psychological symptoms were considered as potential confounders. A semi-structured checklist was designed to obtain the socio-demographic and clinical data including age, sex, education, occupation, marital status, residence, profession, and history of psychiatric and physical conditions. The Symptom Check List-90-Revised (SCL-90-R) is used to estimate a wide range of underlying psychological problems [20]. They include symptoms of somatization, obsessive-compulsion, interpersonal sensitivity, hostility, depression, paranoid ideation, phobic anxiety, and psychoticism. This 90-itemed self-report scale was rated on a 5-point Likert scale (from 0 "not at all" to 4 "extremely") for each item. Subscale scores ≥2 indicate potential psychological issues. Three additional global indices provide measures of overall psychological distress called the General Symptoms Index, the Positive Symptoms Index Total, and the Positive

Symptoms Distress Index. The scale was broadly utilized as a clinical tool in several settings, particularly in the area of mental health [21, 22].

Administrative design

The study was approved by the Zagazig University institutional review board (IRB no. 6215/29-6-2020). All study participants were interviewed via telephone by expert psychiatrists during their work duty hours to discuss the study objectives, confirm confidentiality, and obtain their informed written consent for participation. All study procedures were conducted within the ethical guidelines as outlined in the Declaration of Helsinki and its later amendments.

Statistical Analysis

SPSS (Statistical Package for Social Science) statistical software version 16.0 was used for data analysis. Quantitative data were represented as arithmetic means and standard deviations; the analysis of variance test (ANOVA) was used for continuous variables. Qualitative data were represented as frequencies and percentages; the Chi-square test ($\chi 2$) was carried out for categorical variables. The Pearson correlation coefficient was used to evaluate the degree of relationship between two variables with a linear relationship. To obtain odds ratios (OR) and 95% confidence intervals (CI), logistic regression analysis was used for the identification of the potential predictors of health anxiety to COVID-19 virus infection among HCWs. All results were considered statistically significant when the significant probability was less than 5% ($p < 0.05$).

RESULTS

This study included 218 HCWs from both sexes and all ages and professions. The mean age of the participants was 39.5 ± 8.5 years, and the mean numbers of weekly working days were 5.3 ± 1.1 days. The majority were females (n=156, 72%), nurses (n=111, 51%), and married (n=192, 88%). The lifetime prevalence rates of smoking, chronic medical illnesses, and chronic psychiatric illnesses among HCWs were 15%, 24%, and 6%, respec-

tively. The frequency of health anxiety to COVID-19 virus infection as measured by the SHAI was 28%. The most prevalent positive psychological dimensions were obsessive-compulsive, depression, and psychoticism (20.6%, 20.6%, and 19.3%) respectively. Tables 1 & 2 describe the distribution of participant characteristics according to the health anxiety to COVID-19 virus infection.

Table 1. Sociodemographic and clinical characteristics, and health anxiety to COVID-19 virus infection among HCWs (n=218)

Variables	Health anxiety to COVID-19 virus infection			X^2, ANOVA, P
	Total	Yes	No	
	No. (%), Mean (SD)			
Age	39.5 (8.5)	40.9 (9.0)	38.9 (8.3)	2.7, 0.104
Gender (Male)	62 (28)	16 (25.8)	46 (29.5)	0.3, 0.587
Marital status				
Married	192 (88)	53 (85.5)	139 (89.1)	0.6, 0.457
Unmarried	26 (12)	9 (14.5)	17 (10.9)	
Residence				
Urban	107 (49.1)	28 (45.2)	79 (50.6)	0.5, 0.466
Rural	111 (50.9)	34 (54.8)	77 (49.4)	
Profession				
Physicians	74 (34.0)	9 (14.5)	65 (41.7)	15.5, <0.001
Nurses	111 (50.9)	43 (69.4)	68 (43.6)	
Others	33 (15.1)	10 (16.1)	23 (14.7)	
Number of working (days/week)	5.3 (1.1)	5.7 (0.8)	5.2 (1.1)	10.6, 0.001
Number of sleeping (hours/day)	7.4 (0.9)	6.8 (0.9)	7.6 (0.8)	34.6, <0.001
Smoking (yes)	32 (14.7)	7 (11.3)	25 (16.0)	0.8, 0.373
History of chronic medical illnesses (yes)	53 (24.3)	27 (43.5)	26 (16.7)	17.4, <0.001
History of chronic psychiatric illnesses (yes)	12 (5.5)	6 (9.7)	6 (3.9)	2.8, 0.096

Table 2. Psychological dimensions and health anxiety to COVID-19 virus infection among HCWsa (n=218)

Psychological dimensions	Health anxiety to COVID-19 virus infection			X^2, P
	Total	Yes	No	
	No. (%)			
Obsessive-Compulsive	45 (20.6)	22 (35.5)	23 (14.7)	11.7, 0.001
Depression	45 (20.6)	21 (33.9)	24 (15.4)	9.3, 0.002
Psychoticism	42 (19.3)	18 (29.0)	24 (15.4)	5.3, 0.021
Anxiety	39 (17.9)	12 (19.4)	27 (17.3)	0.1, 0.722
Hostility	39 (17.9)	22 (35.5)	17 (10.9)	18.3, <0.001
Phobic anxiety	36 (16.5)	19 (30.6)	17 (10.9)	12.6, <0.001
Paranoid ideation	36 (16.5)	12 (19.4)	24 (15.4)	0.5, 0.476
Somatization	33 (15.1)	18 (29.0)	15 (9.6)	13.0, <0.001
Interpersonal sensitivity	30 (13.8)	6 (28.4)	24 (15.4)	1.2, 0.270
Positive global indices of distress				
*GSI	42 (19.3)	21 (33.9)	21 (13.5)	11.9, 0.001
**PST	39 (17.9)	21 (33.9)	18 (11.5)	15.1, <0.001
***PSD	21 (9.7)	6 (9.7)	15 (9.6)	0.0, 0.989

aCategorization was based on "t" transformation of SCL R-90 scores. Positive dimensions were considered when "t" scores are higher than 60.

*GSI= Global Severity Index, **PST= Positive Symptoms Total, ***PSD= Positive Symptoms Distress Index

Those who reported higher levels of health anxiety to COVID-19 virus infection were more likely to be identified as nurses (69.4%), working more days weekly (5.7 ± 0.8 days), having lower sleeping hours (6.8 ± 0.9 hours), and reporting a history of chronic medical illnesses (43.5%). The psychological dimensions associated with health anxiety to COVID-19 virus infection were obsessive-compulsive (35.5%), depression (33.9%), phobia (30.6%), somatization (29%), psychoticism (29%), and hostility (19.4%).

Table 3 describes the results from the adjusted logistic regression identifying the predictors of the health anxiety to COVID-19 virus infection among HCWs. Those who had positive depression, hostility, phobia, and somatization dimensions, or reported a history of chronic medical illnesses showed greater odds of health anxiety to COVID-19 virus infection (OR 6.7, 9.1, 7.3, 7.7, and 12.6 respectively). Being physicians and an increased number of sleeping hours were less likely associated with health anxiety to COVID-19 virus infection (OR 0.11 and 0.5, respectively).

Table 3. Predictors of health anxiety to COVID-19 virus infection among HCWs

Variable	B	S.E.	Wald	*P*	OR	95.0% C.I.	
Profession (others)							
Nurses	-1.425	0.864	2.723	0.099	0.240	0.044	1.307
Physicians	-2.193	0.749	8.584	**0.003**	0.112	0.026	0.484
Number of working (days/week)	0.631	0.405	2.422	0.120	1.879	0.849	4.161
Number of sleeping (hours/day)	-0.783	0.261	8.955	**0.003**	0.457	0.274	0.763
History of chronic medical illnesses (No) Yes	2.531	1.008	6.312	**0.012**	12.569	1.745	90.550
Obsessive-Compulsive (No) Yes	0.473	0.548	0.745	0.388	1.605	0.548	4.702
Depression (No) Yes	1.904	0.607	9.842	**0.002**	6.716	2.043	22.070
Psychoticism (No) Yes	-1.117	0.740	2.278	0.131	0.327	0.077	1.396
Hostility (No) Yes	2.217	0.642	11.920	**0.001**	9.177	2.607	32.299
Phobic anxiety (No) Yes	1.987	0.561	12.539	**<0.001**	7.294	2.428	21.906
Somatization (No) Yes	2.044	0.700	8.537	**0.003**	7.725	1.960	30.442

Adjusted logistic regression for potential demographic, clinical, and psychological risk factors associated with increased health anxiety to COVID-19 virus infection

Bold text indicates statistical significance where 95 % confidence intervals do not include the null value (1.00)

Table 4 illustrates the relationship between health anxiety to COVID-19 virus infection and QOL among HCWs. The Health anxiety to COVID-19 virus infection was found to be inversely correlated with all domains of QOL among HCWs.

Table 4. Correlation between health anxiety to COVID-19 virus infection and quality of life among HCWs

Quality of life (QOL) domains	Health anxiety to COVID-19 virus infection	
	r	*P*
Physical health	-0.409	<0.001
Psychological	-0.453	<0.001
Social relationship	-0.224	0.001
Environmental	-0.385	<0.001

r: Pearson's correlation coefficient

Table 5 describes the distribution of characteristics of HCWs according to their profession. Compared to other HCWs, physicians were more likely to be younger (34.5 ± 5.9 years), males (39.2%), unmarried (18.9), of urban residency (75.7%), working lesser numbers of days weekly, sleeping more hours daily, having depressive symptoms (28.4%), and reporting better physical health (55.2 ± 14.5). However, physicians were less likely to report chronic medical illnesses (10.8%), and somatization symptoms (0%).

Table 5. Comparison between physicians and other HCWs

Variables	Physicians *n* = 74	Other HCWs *n* = 144	X^2, ANOVA, P
	No. (%), Mean (SD)		
Age	34.5 (5.9)	42.0 (8.5)	47.1, <0.001
Gender (Male)	29 (39.2)	33 (15.1)	6.4, 0.012
Marital status			
Married	60 (81.1)	132 (91.7)	5.2, 0.022
Unmarried	14 (18.9)	12 (8.3)	
Residence			
Urban	56 (75.7)	51 (35.4)	31.7, <0.001
Rural	18 (24.3)	93 (64.6)	
Number of working (days/week)	4.2 (1.0)	5.9 (0.4)	324.0, <0.001
Number of sleeping (hours/day)	7.7 (0.7)	7.2 (1.0)	15.2, <0.001
Smoking (yes)	14 (18.9)	18 (12.5)	1.6, 0.205
History of chronic medical illnesses (yes)	8 (10.8)	45 (31.2)	11.1, 0.001
History of chronic psychiatric illnesses (yes)	3 (4.1)	9 (6.4)	0.5, 0.480
Psychological dimensions			
Obsessive-Compulsive	12 (16.2)	33 (22.9)	1.3, 0.247
Depression	21 (28.4)	24 (16.7)	4.1, 0.043
Psychoticism	18 (24.3)	24 (16.7)	1.8, 0.175
Anxiety	12 (16.2)	27 (18.8)	0.2, 0.644
Hostility	9 (12.2)	30 (20.8)	2.5, 0.114
Phobic anxiety	12 (16.2)	24 (16.7)	0.1, 0.932
Paranoid ideation	15 (20.3)	21 (14.6)	1.1, 0.284
Somatization	0 (0.0)	33 (22.9)	20.0, <0.001
Interpersonal sensitivity	6 (8.1))	24 (16.7)	3.0, 0.082
Quality of life (QOL) domains			
Physical health	55.2 (14.5)	49.2 (15.7)	7.8, 0.006
Psychological	58.7 (17.3)	56.1 (14.3)	1.4, 0.233
Social relationship	60.8 (20.2)	64.0 (19.2)	1.3, 0.262
Environmental	49.6 (16.8)	49.2 (14.1)	0.1, 0.863

DISCUSSION

HCWs are the first-line fighters during the battle against COVID-19 pandemic in Egypt. To meet their work requirements, HCWs are exposed to stressful work shifts and face an increased and sustained risk of being infected. Our study found that the majority of participants with higher levels of health anxiety to COVID-19 virus infection were nurses (69.4%), which was consistent with the results of a study investigating the mental health wellbeing among physicians and nurses during COVID-19 epidemic in China and found that about 60% of the participants experiencing psychological symptoms were nurses [23]. This may be explained as the nurses, who were mostly females, were facing a greater risk of exposure to COVID-19 patients as they spent more time onwards, provided direct care to the patients, and were responsible for the collection of sputum for virus detection.

During the COVID-19 epidemic, the numbers of HCWs, who spent long hours dealing with patients with limited periods of rest and sleep, were substantial which might contribute to symptoms of anxiety and depression among them. In this study, those who reported higher levels of health anxiety to COVID-19 virus infection were more likely to be identified as working more days weekly (5.7 ± 0.8 days) and having lower sleeping hours (6.8 ± 0.9 hours). Numerous studies investigated the relationship between increased working duty hours and the development of psychological symptoms. A study examined the associations between duty hours and emergence of anxiety and depressive symptoms among full-time employees and concluded that increased working hours (> 55 hours per week) was related to 1.65 and 1.68-fold risks of depressive and anxiety symptoms, respectively [24]. Moreover, several studies concluded that insomnia would be a potential predictor of psychological distress among medical staff [25-29].

Regarding the underlying psychological symptoms, the current study found the most prevalent symptoms associated with health anxiety to COVID-19 virus infection were obsessive-compulsive (35.5%), depression (33.9%), phobia (30.6), somatization (29%), psychoticism (29%), and hostility (35.5%). Similarly, a study found that the prevalence of psychological dis-

tress, anxious symptoms, and depressive symptoms among the medical staff during the COVID-19 outbreak were 15.9%, 16%, and 34.6% respectively.[30] Another study, which compared the psychosocial problems using the Symptom Check List-90-revised (SCL-90-R) between the medical and non-medical health workers during the COVID-19 outbreak, found that the medical staff reported higher and significant rates of anxiety, depression, somatization, and obsessive-compulsive symptoms than nonmedical health workers [26].

Following logistic regression adjusted for potentially significant variables, this study found that symptoms of depression, hostility, phobic anxiety, somatization, reduced hours of sleep, and history of chronic medical illnesses were the most powerful predictors of health anxiety to COVID-19 virus infection among HCWs. These results confirmed the findings of a study that compared 927 medical HCWs (680 physicians and 247 nurses) to 1,255 nonmedical HCWs and found that the medical HCWs reported higher rates of insomnia, anxiety, depression, somatization, and obsessive-compulsive symptoms than nonmedical ones [26]. Also, the history of organic diseases was a common risk factor for anxiety among both medical and nonmedical health workers. Furthermore, it was found that medical HCWs had higher odds for mood disorders, anxiety disorders, sleep disorders, and any psychiatric disorders than nonmedical HCWs [31]. It was claimed that time pressure, insufficient support from supervisors and managers, increased workload, sleep deprivation due to night-shift work, confusion regarding decisions, and reduced autonomy would negatively affect HCWs' mental wellbeing [32].

In this study, health anxiety to COVID-19 virus was found to be inversely correlated with all domains of QOL among healthcare workers. Consistent with this finding, a study showed that frontline medical staff working with COVID-19 patients exhibited more depressive/anxiety symptoms and significantly lower scores on physical and social functioning, and mental health scales of SF-36 than medical staff working in other departments [33]. Another study was conducted to assess the relationship between the long-term psychiatric disturbances and QOL in severe acute respiratory syndrome (SARS) sur-

vivors where 30% of the study participants were HCWs [34]. Though the study was conducted at 2.5 years post – epidemic, it was found that HCWs showed poorer performance in all domains of their QOL. The lack of information about the duration of the crisis, confusion about effective therapies, obligations to provide direct care to infected patients with COVID-19 with the fear of being infected, and shortages of health care resources would hurt different life aspects of HCWs which would be reflected upon assessing the QOL among them [35].

When the HCWs, in this study, were evaluated according to their profession, it was found that physicians were more likely to have depressive symptoms, work lesser numbers of days weekly, sleep more hours daily, and report better physical health than other HCWs. These results were consistent with those of Zhu et al., who estimated the prevalence of depressive symptoms in frontline medical staff (79 physicians and 86 nurses participated in the survey). The prevalence rate of depressive symptoms was higher among doctors (45.6%) than nurses (43.0%) [36]. Another study stated that HCWs who experienced worse self – reported physical health, reported more than sixty working hours weekly, and twice or more night shifts per week with subsequent insufficient sleep resulting in higher rates of anxiety symptoms than their counterparts, nonetheless this study did not compare between physicians and other HCWs [37].

Clinical implications and Recommendations

Mental health services like psychological support and counseling should be accessible to all health care members during the COVID-19 outbreak of HCWs to help them control the expected symptoms of depression, anxiety, insomnia, and psychological distress.

Limitations

This study would be claimed for several limitations. First, the relatively small-sized sample and selection of participants from one Egyptian Province, despite being one of the largest provinces, would affect the generalizability of the re-

sults. Second, the inability to conduct direct face-to-face interviews owing to the outbreak restrictions, and utilizing self-rating measures would increase the probability of response bias. Third, the cross-sectional design of this study does not help to identify the cause-effect relationship. So, further future large-sized longitudinal studies are warranted. Despite these limitations, to our knowledge, this study would be the first to assess the health anxiety to COVID-19 virus infection and identify its relationship with the QOL among HCWs during the pandemic in Egypt.

CONCLUSIONS

Health anxiety to Covid-19 virus infection is common among HCWs, with a negative influence on their QOL. The COVID-19 pandemic has caused heavy psychological impact among HCWs. Future studies are warranted to evaluate the effectiveness of the possible psychological interventions for health care workers as they are first taking part in public health emergencies.

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