The effect of COVID-19 pandemic on the mental wellbeing and coping strategies of health care providers in Kasr Al-Ainy Hospital

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Objective
The pandemic of coronavirus 2019 (COVID-19) in Egypt has represented a distinctive threat in terms of psychological distress for health care providers. The first studies on the effect of the COVID pandemic on health care professionals were developed in China, but with the spread of the pandemic, other countries started to conduct studies analyzing the psychological response of health care workers to the pandemic. This study aims to investigate the mental well-being in terms of depression and anxiety, coping strategies, along with quality of life (QoL) among health care providers working in Kasr Al-Ainy Hospital during the COVID-19 outbreak.

Patients and methods
Self-administered questionnaires were distributed online through Google forms to health care providers (*N*=108) working in Kasr Al-Ainy Hospital from beginning of June to end of August 2020. The questionnaires measured depression, anxiety, coping strategies, QoL, and COVID-19 exposure among Egyptian health care providers.

Results
Overall, ~40% of health care providers in our study were directly involved in the management of patients infected with COVID-19. They showed higher mean Beck Depression and Beck Anxiety Inventories total scores. Participants perceived their current mental health to be worse during the COVID-19 pandemic as compared with before the outbreak.

Conclusions
Both immediate-term and long-term psychiatric services for health care workers in Kasr Al-Ainy Hospital should be implemented to re-establish psychological well-being and enhance QoL and resilience for them during times of severe distress.

Keywords:
anxiety, coping, COVID-19, depression, health care providers, Kasr Al-Ainy Hospital, quality of life

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Introduction

In December 2019, the first pneumonia cases of unknown origin were identified in Wuhan, and the pathogen had been identified as a novel RNA coronavirus (COVID), which was then named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), as it was found to have a phylogenetic similarity to SARS-CoV (Guan *et al.*, 2020). COVID has provoked approximately 4 98 000 deaths among 9.9 million confirmed cases worldwide (John Hopkins University, 2020). Health care professionals (HPs) found themselves confronted by unprecedented traumatic experiences during this pandemic, especially in countries that had not experienced similar epidemic outbreaks (Braquehais *et al.*, 2020). Many health care workers have been redeployed to areas outside their specialty and/or expertise, often working extra shifts to meet high-volume patient demand and are at very high risk for acquiring and possibly transmitting the infection to their patients, colleagues, and family (Shechter *et al.*, 2020). Earlier studies on other infectious diseases, including the SARS, and the Ebola virus disease, time after time showed that many HPs reported symptoms of anxiety and depression, both during and after the outbreak, causing a severe effect on their coping abilities, unfortunately in some cases with long-lasting enduring effects (Arafa *et al.*, 2020; Bettinsoli *et al.*, 2020; Gómez-Duran *et al.*, 2020; Shaukat *et al.*, 2020).

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Braquehais *et al.* (2020) and Pappa *et al.* (2020) further stated that HPs working in the first line of care, with higher clinical responsibilities and those who have been infected have had higher incidence of anxiety and depressive symptoms. A study conducted by Zhang *et al.* (2020) found that medical health workers compared with nonmedical health workers had a higher prevalence of anxiety (13.0 vs. 8.5%; $P<0.01$), depression (12.2 vs. 9.5%; $P<0.04$), somatization (1.6 vs. 0.4%; $P<0.01$), and obsessive–compulsive symptoms (5.3 vs. 2.2%; $P<0.01$). Over and above, in developing countries, where the health care system is overburdened, surges of COVID-19 cases provoked severe anxiety and irritation among medical personnel. This might be compounded by the insufficient hospital supply of required personal protective equipment among HPs, who are at the highest risk of transmission (Dubey *et al.*, 2020). Over and above, remaining separated from family during an infectious disease outbreak may exact an enormous emotional toll on HPs (Chen *et al.*, 2020).

Quite the opposite, health care providers who are not involved in direct care of patients with COVID-19 and thus have to stay at home for imprecise periods during lockdowns experienced feelings of isolation, loneliness, and worthlessness with respect to their inability to effectively contribute to the present crisis (Dubey *et al.*, 2020).

In fact, a big concern is that HPs may be reluctant to ask for help if needed. Self-treatment, denial, rationalization, or minimization may be initial defense mechanisms used to confront stressful situations but may result in not seeking appropriate help when developing a mental disorder (Lu *et al.*, 2020).

In the existing pandemic, health care providers from all professions are facing significant challenges in coping with the crisis. There have been previous research studies that have investigated the coping strategies that medical staff can use during disease epidemics. Personality traits, such as optimism and resilience, have previously shown to have positive effects on reducing psychological tension (Park *et al.*, 2018). COVID-19 pandemic was also associated with impaired quality of life (QoL) among local residents (Zhang and Ma, 2020). Yet there are not enough data till the moment on the QoL in HPs during the COVID-19 pandemic. Impaired QoL can disrupt the efficiency of medical personnel in providing medical services and may lead to a reconsideration of the chosen profession. It is important not to lose the sense of what they are doing and for them to have the experience that they are not fighting all alone (Stojanov *et al.*, 2020).

The aim of this work was to assess the level of depression and anxiety among health care staff working in Kasr Al-Ainy Hospital during COVID-19 pandemic, to measure their coping strategies in the face of these stressful circumstances, and also to evaluate the effect of the pandemic on their QoL.

Patients and methods

This is a cross-sectional study performed via an online survey during the first wave of COVID-19 in Egypt from June to August 2020 distributed among medical personnel working in Kasr Al-Ainy Hospital.

Patients

A total of 108 medical health providers (physicians, nurses, and other medical personnel) completed an online survey using Google forms that took ~20 min to complete. They worked in different specialty departments in Kasr Al-Ainy Hospital.

Measures

The survey included sociodemographic data, COVID-19-related data, Beck Depression Inventory, Beck Anxiety Inventory, Brief COPE scale, and Quality-of-Life scale (QoLS).

The first section of the study included questions about sociodemographic data, field of specialty, academic position, and COVID-19-related data such as whether participants were in direct contact with COVID-19-infected patients, were infected with COVID-19, or knew someone who was infected with COVID-19. This was followed by Beck Depression Inventory-II, which is a 21-item, multiple-choice inventory. Respondents are asked to rate each item based on four response choices according to the severity of the symptoms, ranging from the absence of a symptom to an intense level, during the past week. It has a reasonable reliability and validity for psychiatric and nonpsychiatric population (Steer *et al.*, 1997). The Beck Anxiety Inventory (Beck *et al.*, 1988) is a self-report questionnaire measuring 21 common somatic and cognitive symptoms of anxiety. It has convergent and discriminant validity and internal consistency reliability.

The Brief COPE scale was designed to assess a broad range of coping responses among adults. It contains 28 items and is rated by the four-point Likert scale, ranging from 'I haven't been doing this at

all' (score 1) to 'I have been doing this a lot' (score 4) (Carver, 1997). Finally, the QoLS 16-item version was used; it was created originally by John Flanagan (1970) and had been adapted for use in chronic illness groups. Reliability, content, and construct validity testing has been performed on the QoLS. The QoLS is a valid instrument for measuring QoL across patient groups and cultures and is conceptually distinct from health status or other causal indicators of QoL. The participants chose one of seven responses: 'delighted' (7), 'pleased' (6), 'mostly satisfied' (5), 'mixed' (4), 'mostly dissatisfied' (3), 'unhappy' (2), 'terrible'(1). All participating health care providers approved to participate in the survey, and their responses were anonymous (Burckhardt *et al.*, 2003).

Statistical analysis

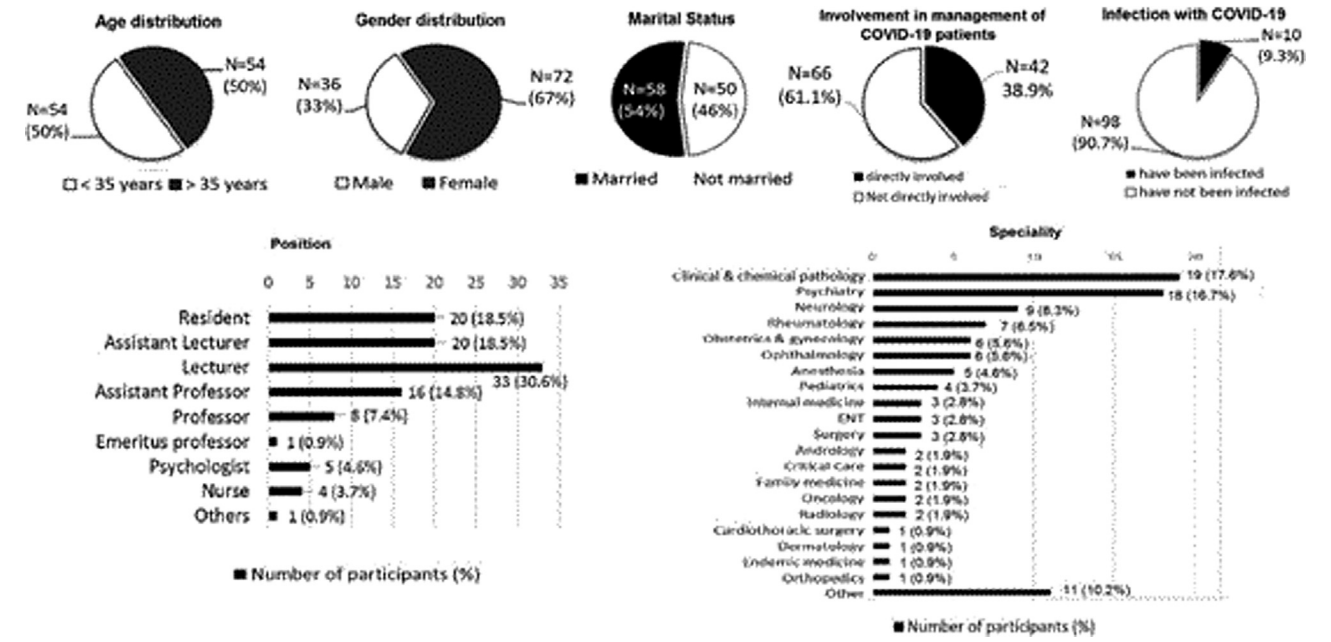
Data were analyzed using SPSS, version 20 (IBM, 2011) (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.). Data were presented using mean and SD for quantitative variables and frequency and percentage for qualitative ones. Comparison between groups for qualitative variables was performed using χ^2 or Fisher's exact tests, whereas for quantitative variables, the comparison was conducted using independent sample *t* test (if normally distributed) or Mann–Whitney test (if not normally distributed). *P* values less than or equal to 0.05 were considered statistically significant. Ethical approval was obtained from Department of Psychiatry scientific committee for this study.

Results

(1) Regarding the demographic data, in this study, the total number of participants was 108. The age range of the participants was 19–75 years old (35.8±8.21), where 50% were under 35 years old. Regarding the sex distribution and marital status of the study sample, 33.3% of the participants were males and 66.7% were females, 53.7% were married, whereas 46.3% were single. The participants were recruited from various departments in Cairo University Hospitals. Most of the participants were physicians (90.8%), whereas 3.7% were nurses and 4.6% were other medical health providers. Only 9.3% of the participants had been infected with COVID-19 themselves and 96.3% of all participants had known a person infected with COVID-19. The demographic data of the participants in this study are represented in Fig. 1.

(2) Comparison between participants directly involved in the management of patients infected with COVID-19 (group 1) and those not directly involved (group 2) was as follows: 38.9% of the participants were directly involved in the management of patients infected with COVID-19 (group 1) and 61.1% were not directly involved in their management (group 2). As shown in Table 1, group 2 showed a greater mean age than group 1, with a statistically significant difference (*P*=0.005). The number of participants infected by COVID-19 in group 1

Figure 1



Demographic data of the participants.

Table 1 Group demographics and comparison between groups

	Demographics				Beck Depression Inventory		Beck Anxiety Inventory			Quality of Life Scale	
	Age (years) (mean ±SD)	Sex (male/ female)	Marital status (not married/ married)	Infected/ non-infected	Self-criticalness (mean±SD)	Total score (mean ±SD)	Feeling hot (mean ±SD)	Terrified or afraid (mean ±SD)	Total score (mean ±SD)	Socializing (mean ±SD)	Total score (mean ±SD)
Group 1[a] (*N*=42)	33.07 ±5.97	18/24 (42.9%/ 57.1%)	20/22 (47.6%/ 52.4%)	9/33 (21.4%/ 78.6%)	1±1.04	15.43 ±11.61	0.76 ±0.96	0.9±0.98	12.6 ±11.35	4.6±1.71	77.43 ±18.88
Group 2[b] (*N*=66)	37.48 ±9.04	18/48 (27.3%/ 72.7%)	30/36 (45.5%/ 54.5%)	1/65 (1.5%/ 98.5%)	0.59±0.76	13.45 ±8.94	0.36 ±0.6	0.53±0.79	9.18 ±8.16	3.82±1.83	76.12 ±18.92
	P=0.005	*P*=0.094	*P*=0.826	*P*=0.001	*P*=0.043	*P*=0.636	*P*=0.029	*P*=0.035	*P*=0.214	*P*=0.031	*P*=0.753

[a]That has been directly involved in the management of coronavirus 2019-infected patients. [b]That has not been directly involved in the management of coronavirus 2019-infected patients.

was significantly higher than in group 2 (*P*=0.001), probably owing to their greater exposure. When comparing depressive symptoms in both groups, group 1 showed a generally higher mean Beck Depression Inventory total score than group 2 (*P*=0.636); however, the difference was not statistically significant. Group 1 showed a particularly higher self-criticalness subscore than group 2 (*P*=0.043), though the two groups did not show a significant difference in the other subscores (as shown in Table 1). As per Table 1, when comparing the two groups regarding their anxiety level, group 1 showed generally higher Beck Anxiety Inventory mean subscores and total score than group 2, indicating higher levels of anxiety in group 1; however, only 'feeling hot' and 'terrified or afraid' subscores showed a statistically significant difference between both groups (*P*=0.029 and 0.035, respectively). However, both the total mean Beck Depression Inventory and Beck Anxiety Inventory total scores in both groups revealed only mild levels of depression and anxiety. When we compared the coping styles of both groups using the Brief COPE questionnaire, no significant difference was found, except in the coping style of 'trying to see it in a different light, to make it seem more positive,' where this mean subscore in group 2 was higher, with a statistically significant difference (*P*=0.046). We also assessed the effect of COVID-19 on the QoL in both groups using the QoLS. The scores of the latter scale have not revealed significant differences between both groups except in the score related to satisfaction with socializing with others, where group 1 showed more satisfaction with socialization (i.e. a higher mean score), with a statistically significant difference (*P*=0.031) (as shown in Table 1). The greater satisfaction with socialization in group 1 may be related to their possible need for any support or socialization amidst their daily overwhelming responsibility and stressful work.

(3) Comparison between female and male participants:

The mean age of the female participants (37.3±9) was greater than that of the male participants (32.69±5.4), with a statistically significant difference (*P*=0.012). More than half of the female participants (56.9%) were above 35 years old, in contrast to only 36.1% in the male group (*P*=0.041). The percentage of married participants in the female group was 51.4% which was not significantly different than the male group 58.3% (*P*=0.495). Overall, 50% of the male participants were directly involved in the management of patients infected with COVID-19 in contrast to 33.3% of the female participants, with no statistically significant difference (*P*=0.094). In addition, the number of participants infected by COVID-19 in both the male and female groups was comparable. When comparing both the male and female participants regarding depressive and anxiety manifestations using Beck Depression Inventory and Beck Anxiety Inventory, respectively, no significant difference was found between any of the mean scores in both groups, revealing relatively similar degrees of mood and anxiety symptoms. Both groups generally showed mild degrees of depression and anxiety as revealed by the mean total Beck Depression Inventory and Beck Anxiety Inventory in both male and female participants. Regarding the Brief COPE questionnaire, the female group showed some significantly higher mean subscores than male participants (as shown in Table 2), revealing particularly more frequent use of some coping strategies among the female participants, like saying things to let their unpleasant feelings escape (*P*=0.036), trying to get help and advice from other people (*P*=0.014), expressing their negative feelings

Table 2 Comparison between male and female participants regarding the Brief COPE scale

	Male (*N*=36) (mean±SD)	Female (*N*=72) (mean±SD)	*P* value
Saying things to let unpleasant feelings escape	1.81±0.92	2.22±1.01	0.036
Doing something to think about it less. Such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping	1.94±0.98	2.56±1.03	0.004
Expressing negative feelings	1.67±0.89	2.19±0.88	0.002
Trying to get advice or help from other people	1.83±0.94	2.28±0.94	0.014

(*P*=0.002), and doing recreational activities to think less about the stressful condition (*P*=0.004). Finally, no significant difference was found between male and female participants, when we compared the degree of satisfaction with their current QoL, using the QoLS.

Discussion

Most of the health care staff was females (66.7%), and the majority was physicians (90.8%), probably owing to their close and frequent contact with patients and longer working hours. Approximately 53.7% of the participants were married, and the mean age of the participants was 35.8±8.21 years, with an age range of 19–75 years. Overall, 96.3% of all participants had not been infected with COVID-19 but had known a person infected with the disease. Approximately 38.9% of the participants were directly involved in the management of patients infected with COVID-19.

When comparing between participants directly involved in the management of patients infected with COVID-19 (group 1) and those not directly involved (group 2), there was a statistically significant difference in the mean age between both groups, where group 1 showed younger mean age of 33.07±5.97 years, as most of the physicians who were involved in the direct management of patients infected by COVID-19 were the residents, assistant lecturers, and lecturers (*P*=0.005). The number of infected health care workers in group 1 was higher than group 2, as group 1 was in direct and close contact with COVID-19-infected patients and more prone to infection (*P*=0.001).

Results of the study showed that both groups had mild degree of depression and anxiety. The results of the study were consistent with the results of the study done by Lai *et al.* (2020) in China, which was conducted on the health care providers and showed that 71.5% of all participants reported symptoms of depression and anxiety. Another Chinese study done by Zhang *et al.* (2020) showed high prevalence of depression and anxiety in health care providers. The fact of the high and rapid infectious spread of the disease, changes in the work due to increased duration of working, and increase in suspected and actual cases of patients, as well as concerns about safety of self could have increased depressive and anxiety symptoms among them (Lai *et al.*, 2020; Zhang *et al.*, 2020). The mild degree of the depressive and anxiety symptoms in the current study might be related to that most of the participants are not in direct management with the COVID-19-infected patients (61.15) and 96.3% of all participants had not been infected with COVID-19.

Although there were no statistically significant differences between both groups on the total score of Beck Depressive Inventory (*P*=0.636) and Beck Anxiety Inventory (*P*=0.214), the results showed higher mean total score of depression and anxiety among group 1, indicating higher levels of depressive and anxiety symptoms. On the contrary, group 1 showed a statistically significant difference regarding self-criticalness subscore (*P*=0.043) and 'feeling hot' and 'terrified or afraid' subscores (*P*=0.029 and 0.035, respectively). These results might be related to being in the frontline and in direct contact with the COVID-19-infected patients; the high level of burden, stress, and professional responsibility toward the patients; the high morbidity and mortality rates of the patients in this pandemic; the shortage in personal protective equipment; the increased number of infected health care providers with COVID-19 in group 1; being isolated; the fear of they or their family members becoming infected; and the absence of an effective treatment and vaccine on the immediate horizon. This result was concordant with the Chinese studies done by Lai *et al.* (2020) and Zhang *et al.* (2020), which showed that working in the frontline, directly treating patients with COVID-19, appeared to be an independent risk factor for all psychiatric symptom compared with working in second-line positions (Lai *et al.*, 2020; Zhang *et al.*, 2020).

Another Chinese study conducted by Cai *et al.* (2020a) on 1173 medical workers showed that frontline medical workers had statistically significant higher rates of depressed mood and anxiety symptoms than

nonfrontline medical workers, which was consistent with the results of this study, which showed more depressive and anxiety symptoms in group 1, although differences are statistically nonsignificant between both groups. This might be related to the large number of participants recruited in the Chinese study (Cai *et al.*, 2020a). The results of the current study were also consistent with the results of the Arab study done in Oman by Badahdah *et al.* (2020) on 194 participants where most of them where females, young physicians, which showed that COVID-19 affected physicians' mental health, especially female and young physicians. The study by Badahdah *et al.* (2020) showed that physicians experienced similar amounts of anxiety regardless of their contact with COVID-19-infected patients.

Results of the current study showed that no statistically significant differences were found between both groups regarding the effect of COVID-19 on the QoL and coping strategies except in the score related to satisfaction with socializing with others (P=0.031). Group 1 showed higher level of satisfaction with socialization with others and doing things. This result might be related to the possibility of trying to cope with the stress and burden of the work as well as overcoming the anxiety and depressive symptoms. This result was consistent with a Chinese study done by Cai *et al.* (2020b) on the psychological effect and coping strategies of frontline medical workers, which showed that increase in the motivational factors and coping strategies among the medical staff through joking with colleagues and chatting with coworkers and friends, as well as positive work environment among their familiar friends, colleagues, and leaders who work with them in the field, decreases the level of stress and encourages the continuation of work. Coping strategies that were used by health care providers to reduce stress during the COVID-19 pandemic is an important topic that requires further long-term studies to investigate (Cai *et al.*, 2020b). Social support has been consistently a protective factor that decreases the level of distress during the pandemic (Braquehais *et al.*, 2020). In addition, a study conducted by Wang *et al.* (2020) in the early stage of the COVID-19 pandemic in China concluded that negative coping processes were associated with higher level of psychological distress, and they recommended urgent psychological interventions targeting coping strategies during the outbreak (Wang *et al.*, 2020).

Previous studies have shown that sex differences exist regarding the ability to cope with stress. Women in society and at work are more likely than men to develop social and personal mechanisms to cope with stress. Factors of reducing stress had larger effect on female health providers. Correct guidance and effective safeguards for prevention from disease transmission reduced the anxiety of the female health providers. Women utilized significantly more emotional and instrumental support to cope with stress (Eisenbarth, 2019; Hunan Provincial Center for Disease, 2020). The results of the current study were consistent with the previous studies' results, as in this study, the female group showed some significantly higher mean subscores than male participants on the Brief COPE questionnaire, revealing particularly more frequent use of some coping strategies among the female participants, like saying things to let their unpleasant feelings escape (P=0.036), trying to get help and advice from other people (P=0.014), expressing their negative feelings (P=0.002), and doing recreational activities to think less about the stressful condition (P=0.004).

Strengths and limitations of this research

To the knowledge of the researchers, this is the first study to be conducted in Kasr Al-Ainy Hospital to assess severity of depression, anxiety, coping strategies, and QoL among medical personnel during the COVID pandemic. Anonymity of the responders allowed for more participation among health care providers who are almost always reluctant to seek psychiatric help for fear of stigma in Egypt. It actually alarmed them that they are suffering from a problem, and they are in a need to seek consultation.

As for the limitations, first, the psychological assessment was based on an online survey which had to done this way to keep social distancing during the pandemic and limit spread of the infection, yet the use of clinical interviews in future studies will give a more comprehensive psychiatric assessment of the participants. Second, further studies with a larger randomized sample would help to give more precise data representing health care providers.

Conclusions

Higher prevalence of psychiatric symptoms was found among health care providers working in Kasr Al-Ainy Hospital during COVID-19 outbreak. Medical health care providers are in need of health protection and content working conditions, for example, provision of necessary and sufficient medical protective equipment, arrangement of adequate rest, as well as recovery programs aimed at increasing the resilience and psychological well-being. Special interventions to promote psychological well-being in health care

providers during the COVID pandemic need to be immediately implemented with particular attention to the frontline health care providers to protect them as much as possible before the second wave of the pandemic.

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Conflicts of interest

There are no conflicts of interest.

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