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Abstract

Background: The COVID-19 pandemic has had a significant impact on public health, including healthcare workers and healthcare systems, worldwide.

Aims: To investigate COVID-19-related psychological impact on healthcare workers in 12 Arab countries.

Methods: This was a cross-sectional, hospital-based online survey conducted between 4 May

and 8 June 2020. We evaluated stress, depression, anxiety, and insomnia using the Depression Anxiety Stress Scale and Insomnia Severity Index.

Results: A total of 2879 respondents from 12 Arab countries completed the survey. Anxiety, depression, stress, and insomnia were reported by 48.9%, 50.6%, 41.4% and 72.1% of respondents, respectively. Lower-middle- and lower-income countries had a significantly higher prevalence of all the psychological outcomes than high-income countries. The prevalence of mental health symptoms was higher among healthcare workers aged 30–39 years, those who worked > 44 hours per week, and those in contact with COVID-19 cases, as well as healthcare workers who were not satisfied with the preventive measures. The prevalence of mental health symptoms was lower among male healthcare workers.

Conclusion: COVID-19 had a considerable impact on the mental and psychological health of healthcare workers in Arab countries. This was aggravated by the geopolitical location of some Arab countries and social norms usually observed during the month of Ramadan. Being a physician or a young healthcare worker, and long working hours were risk factors for greater psychological impact of the outbreak.

Keywords: healthcare workers, COVID-19, anxiety, depression, stress, insomnia, mental health

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Introduction

The COVID-19 pandemic poses a threat to the physical and mental health of individuals, particularly healthcare workers (HCWs), in low- and high-income countries (1,2). Several studies have identified factors that exacerbate psychological morbidity among HCWs during infection outbreaks. The sudden increase in workload due to extraordinary infection control and quarantine measures that result in severe staff shortages are among the most relevant factors worsening HCWs' mental health (3–5). The associated mortality and morbidity, and rapidly changing recommendations and preventive procedures also contribute to psychological morbidity (3,5). There are many changes in the social life of HCWs that contribute to psychological distress, such as fear of exposing their families to infection, avoidance of interaction with colleagues, changes in eating and drinking habits, and lack of face-to-face communication (3,5). Moreover, comprehensive media coverage of the outbreak and financial problems due to work restrictions can increase the psychological burden (3).

The psychiatric morbidity related to the 2002–2003 SARS outbreak persisted for up to 2 years following the outbreak, with worrying levels of depression, anxiety, post-traumatic symptoms, and high levels of stress among HCWs. The outbreak had important consequences for quality of care, such as missing work shifts, reduced face-to-face communication with patients, and behavioural problems (e.g. increased smoking and alcohol consumption) (6).

There are limited data available for the psychological impact of COVID-19 on HCWs in the Arab world. Therefore, this study aimed to establish the risk factors and measure the impact of the first wave of the COVID-19 pandemic on the mental health of HCWs in hospital environments in Arab countries.

Methods

Study design and setting

The study protocol was approved by the Institutional Review Board of the College of Medicine, King Saud University (Approval No. E-20-4848), Riyadh, Saudi Arabia. The study followed the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines (7). It was a cross-sectional, hospital-based online survey among HCWs to assess their mental health during the first wave of the COVID-19 pandemic, using an anonymous questionnaire in Arabic and English languages. The study targeted HCWs in hospitals in 12 Arab countries: high-income countries (HICs) represented by the Gulf Cooperation Countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates); upper-middle-income countries (UMICs)

represented by Lebanon and Jordan; lower-middle-income countries (LMICs) including Egypt, Tunisia and Palestine; and low-income countries (LICs) like Sudan (8).

The one-time web survey link was sent to the employees. Study data were collected and managed using REDCap (Research Electronic Data Capture) (9). To ensure consistency and privacy of the study data and avoid duplication in the analysis, a unique identifier was generated by the software and used to collect and store data pertaining to each respondent. The survey was conducted between May 4 and June 8, 2020. Supplementary Figures 1 and 2 show the number of confirmed cases/country and the case fatality during data collection (10).

Sampling technique and sample size

This was a cross-sectional study using a snowball convenient sampling technique. The starting points were the collaborators in each of the 12 countries that started independently a snowballing through a network of acquaintances. All HCWs who reported working in hospitals were eligible to participate. Because of the self-selected and nonprobabilistic nature of the sample, invitations and response rates could not be quantified and we did not need a list for the participants, as reported by American Association for Public Opinion Research reporting guidelines (11). The sample size was estimated using STATA-16. The proportion of HCWs with psychological comorbidities was estimated at 35% (6), study power was 99% ($\beta = 0.01$, $\alpha = 0.05$ and $\delta = 0.05$). The estimated minimal sample size was 2000, and we increased the sample size to 2897 to allow for subgroup analyses and to compensate for incomplete data.

Variables and data measurement

Depression, anxiety and stress

We measured depression, anxiety and stress using the Arabic and English short version of the Depression Anxiety Stress Scale (DASS-21), which measured the symptoms over the week preceding data collection (Supplemental Survey Questionnaire) (12). DASS-21 is a valid and reliable screening instrument both in English (13) and Arabic (14). The scale includes 21 items measured on a 4-point Likert scale ranging from 0 to 3. The scores were multiplied by 2 to calculate the final score after summing up the scores for each of the 3 components. Each subscale includes 7 items and the depression, anxiety and stress subscale scores are described in Figure 1. The cutoff scores for detecting symptoms of depression, anxiety and stress were > 9, > 7 and > 14, respectively (1,15).

Insomnia

We used the Arabic (16) and English (17) versions of Insomnia Severity Index (ISI) to assess insomnia over the 2 weeks preceding the survey. The instrument has robust psychometric proprieties and is a reliable tool for quantifying perceived insomnia severity (18). The ISI is a

7-item self-reported questionnaire with 5 ordinal scales: the first 3 questions are measured on a 5-point Likert scale ranging from 0 (no problem) to 4 (very severe problem). The responses of the last 4 questions range from 0 (very satisfied) to 4 (very dissatisfied). A total score range of 0–28, categorized into 4 levels, is described in Figure 1 (17). The cutoff score for detecting symptoms of insomnia was > 7 (19). Other data like sociodemographic and occupational data were included.

Statistical methods

We used SPSS for Windows version 21 (IBM Corp., Armonk, NY, USA) for data analysis. Descriptive analysis was used to describe demographic characteristics. The ranked data, derived from counts of each level for symptoms of depression, anxiety, stress and insomnia, were presented as numbers and percentages. The 2 test was used to determine the association between variables. We used multivariable logistic regression analysis to determine potential risk factors for symptoms of depression, anxiety, stress and insomnia. The associations between risk factors and outcomes are presented as adjusted odds ratios (ORs) and 95% confidence intervals (CIs), after adjustment for confounders, including, country and sociodemographic and occupational factors. Using two-tailed tests, P

Results

Data were complete for 2879 HCWs from 12 Arab countries. The highest response was from Saudi Arabia (27.3%), followed by Egypt (14.2%) and Jordan (12.8%), while participants from Sudan, Oman and Lebanon had the least response. Most participants were female (61.9%), aged 45 hours. More than 50% had work experience of 6–15 years, and about a third > 15 years. About two thirds of participants worked in hospitals equipped for treatment of COVID-19 patients (Supplementary Table 1).

Using the defined cutoffs of the DASS-21 and ISI revealed that anxiety, depression, stress and insomnia were identified in 48.9%, 50.6%, 41.4% and 72.1% of respondents, respectively. Distribution of these psychological outcomes was highest in LMICs, except for Palestine, where all the psychological outcomes and insomnia were lower than in most other countries regardless of economic status. For an example of an LMIC, in Egypt, the percentages of those positive for anxiety, depression, stress and insomnia were 65.0%, 69.0%, 58.0% and 87.0%, respectively, versus 43.0%, 36.0%, 24.0% and 60.0% in Saudi Arabia. In comparison to other Gulf countries, Saudi Arabia had the lowest prevalence of all the psychological outcomes and insomnia (Figure 2). The psychological outcomes and insomnia were substantially higher in countries with higher than lower case fatality rates (Supplementary Figure 2). It was common to have > 1 mental health problem; > 40% of physicians scored positive for 3 mental health disorders, compared to about 33% of nurses and allied HCWs. Multiple mental health disorders were more frequent among HCWs who had contact with COVID-19 cases (Supplementary Figure 3).

Table 1 shows distribution of anxiety, depression, stress and insomnia among all studied groups. All psychological outcomes and insomnia were more common in physicians; HCWs with direct contact with COVID-19 patients; HCWs with family members or friends diagnosed with COVID-19; HCWs not satisfied with hospital safety measures; HCWs who believed they were at high risk of acquiring COVID-19; HCWs who felt stigmatized by the community; and HCWs who smoked more during the pandemic. All the psychological outcomes and insomnia were significantly less frequent in HCWs who were married, aged ≥ 50 years, and with work experience > 15 years. Stress and insomnia were significantly higher among male HCWs, while anxiety was significantly higher among female HCWs. Living with family was associated with a higher rate of depression, stress and insomnia. Insomnia and depression were lower among HCWs who worked ≤ 20 hours/week. The prevalence of severe and very severe forms of anxiety, depression and stress and clinically severe insomnia was 21.2%, 17.9%, 16.6% and 9.7%, respectively. The severity of anxiety, depression, stress and insomnia was greater among HCWs who had contact with COVID-19 patients (Figure 1).

Adjusted analysis revealed that, anxiety, depression and stress were independently associated with feeling stigmatized, perceived higher risk of getting infection, dissatisfaction with hospital preventive measures, and working > 44 hours/week (Table 2). Also, the odds of anxiety, depression and stress were significantly higher among physicians than other professions, and in HCWs aged 30–39 years than other age groups. Direct contact with COVID-19 cases was independently associated with anxiety and stress, but not with depression, while living with family during the pandemic was independently associated with stress. Male gender significantly decreased the odds of anxiety. Age

The psychological outcomes and clinically significant insomnia according to country was tested by logistic regression adjusted for all variables (Table 3). We considered Saudi Arabia as a reference because it had the largest number of participants. Among HICs, Oman and Qatar did not differ significantly from Saudi Arabia, while Kuwait and United Arab Emirates had higher levels of stress. Among LMICs, Egypt had significantly higher levels of all the psychological outcomes, and odds of anxiety, depression and stress were about 2-fold higher than those of Saudi Arabia. Tunisia had a higher prevalence of depression and stress, while Sudan had a lower prevalence of insomnia. Among UMICs, Jordan had significantly higher prevalence of depression, stress and insomnia, while Lebanon had higher prevalence of stress. Palestine had significantly lower prevalence of anxiety, depression and insomnia.

Discussion

This study investigated mental health symptoms in 2879 HCWs from 12 Arab countries during the first wave of the COVID-19 pandemic. Anxiety, depression, stress and insomnia were identified in 48.9%, 50.6%, 41.4% and 72.1% of respondents, respectively. The prevalence of mental health symptoms was higher in HCWs aged 30–39 years; those who were working > 44 hours/week; those in contact with COVID-19 patients, including family and friends; those who

were not satisfied with the preventive measures; those who felt stigmatized; and those who perceived themselves to have higher susceptibility to infection. The prevalence was lower in HICs, male HCWs, and nurses.

The spectrum of mental health problems found in this study was similar to that reported for the previous SARS outbreak in 2002–2003 (20). Our results are consistent with 2 previous studies that investigated the psychological responses of HCWs to COVID-19 in China and Italy (2, 21). However, the prevalence of anxiety, depression and insomnia was higher than that reported in a systematic review on the current pandemic that included studies from China and Singapore (22). The higher prevalence of psychological problems may be attributed to the new experience of a pandemic as severe as COVID-19 for most Arab countries compared to other nations. The exception was Saudi Arabia, which had previous experience with an outbreak of Middle East respiratory syndrome (23). This observation is further supported by the low prevalence of all psychological problems among Saudi respondents compared to those from other countries. Nevertheless, the higher rate of mental health problems than in other studies may be explained by the high rate preceding COVID-19 due to armed conflict in many Arab countries. However other factors like reduced accessibility to formal psychological support (24), lack of medical information on the outbreak, lack of intensive training on personal protective equipment (PPE) and lack of infection control measures may have contributed (22).

Two recent studies that used DASS-21 among HCWs in Turkey and China reported a similar prevalence for severe and very severe anxiety (12.6–22.1%), depression (9.3–19.7%) and stress (19.1–19.4%) (15, 25). The prevalence was clearly higher than that reported among the general population of China (8.4%, 4.3% and 2.6% for very severe anxiety, depression and stress, respectively) (1).

In this study, the prevalence of clinically severe insomnia (72.1%) was higher than that reported by 2 studies from China (1.4% and 1%) (2, 26). A possible confounder to this high prevalence of insomnia relevant to our region was that most of the Muslim nations were observing Ramadan during the data collection. Fasting during Ramadan is associated with change in lifestyle and sleeping habits. We were surprised by our finding that the odds of developing insomnia were lower among HCWs who worked in hospitals for COVID-19 patients than in other hospitals. This may be explained by the longer period of work and off-work (14 days) in most hospitals for COVID-19 patients than other hospitals (27). This pattern of work may have allowed regulation of sleep pattern during the long period off work.

We noted variation in the prevalence of psychological morbidities between the participating Arab countries in our study. The data showed that LMICs and LICs like Egypt and Sudan had a

significantly higher prevalence of all the psychological outcomes than HICs such as Saudi Arabia, Oman and Qatar. The exception to this observation was the LMIC Palestine, where HCWs reported lower rates of mental health problems. This difference between LMICs and HICs may be explained by the differences in the availability of PPE, healthcare resources, hospital settings, and availability of intensive care unit beds, in addition to the existence of occupational health programmes that may have contributed to the lower prevalence of psychological problems in HICs (28, 29). Again, the exception was HCWs from Palestine, who showed a prevalence of mental health problems comparable to those in HICs rather than LMICs as expected. This may be explained by the fact that the epidemic had just started in Palestine with few patients and fatalities when the study was conducted. This explanation is supported by previous findings that Palestinian emergency HCWs in regions with more armed conflicts were more resilient than those in regions with fewer conflicts (30).

In contrast to earlier studies (2,28), our results showed that physicians had a higher level of mental health problems than nurses and other HCWs. These results may be confounded by the fact that the burden of examining and managing hospitalized patients in Arab countries lay heavily on their shoulders (31), as well as the possible shortage of physicians and higher workload than other countries (8), and their greater involvement in high-risk procedures such as intubation than other HCWs (32).

It is also notable that all the psychological outcomes and insomnia were more common in those who smoked more during the pandemic. It has been suggested that the impact of long working hours and rotational shift patterns on work-related stress is mediated by a set of maladaptive behaviours and coping responses such as increased smoking (33,34).

All the psychological outcomes and insomnia were significantly less frequent in married participants. Similar results were reported during previous outbreaks such as SARS (35). This may be explained by the fact that married individuals are in a supportive relationship that may provide protection from mental health problems (36). However, individuals living with their families, married or unmarried, can develop fear of transmitting infection to their families, as demonstrated by our results.

In this study, age and gender were significantly associated with adverse mental health outcomes. Younger age (30–39 years) was independently associated with depression, anxiety, stress and insomnia. Fewer years of experience and working > 44 hours/week were associated with adverse psychological outcomes, as reported previously (37). This is further supported by our finding that longer work experience of 6–10 years was protective against depression. Male HCWs showed fewer symptoms of depression, anxiety and stress, which is consistent with

other studies in which women were at higher risk than men for mental health symptoms (2, 28).

We identified a group of risk factors that were related to increased perception of danger of infection for HCWs or their families. Being in direct contact with patients was a source of anxiety and stress, while having a relative or friend with COVID-19 was associated with anxiety and depression. Dissatisfaction with preventive measures, and perceived higher risk of infection were associated with all outcomes. These results are consistent with studies from other countries (2,38). Other possible contributing factors included the high infectivity, long incubation period, potential fatality of COVID-19, shortage of and lack of training in PPE (5), in addition to rapid changes in infection control measures with emerging knowledge about the virus (38).

The impact of COVID-19 on mental health of HCWs was related to being stigmatized by the neighbourhood community. More than 37% of HCWs in our study felt stigmatized, and this was associated with adverse mental health outcomes. Similar findings from previous studies have been reported (4).

The findings of our survey could be a valuable source for the development of national or regional guidelines with the aim of reducing psychological problems among HCWs during pandemics. Additional measures may include increased staffing levels through task shifting and directed training and general education on management of epidemics. Social media could make a major contribution to reducing stigmatizing reports in the public domain. Although hospitals are required to have protocols for emergency mental health services, research is needed to address the gap in knowledge about mental and occupational health in Arab countries.

The large coverage of 12 Arab countries, including HICs and LMICs, highlighted the unique features of the impact of the COVID-19 pandemic on HCWs as a single group who share many geopolitical conditions, as well as its impact on different nations with different socioeconomic characteristics. The limitations of this survey included the low response from some countries, which may have skewed our results towards countries with higher response. However, low responses could not be avoided at the time of data collection because different countries were at different stages of the pandemic as well as at different stages of preparedness. Collecting data during Ramadan may have confounded some outcomes like insomnia; however, the study was conducted to advise policy and strategic planning at the outset of the pandemic. Furthermore, there may have been a selection bias due to the voluntary participation of respondents in the study.

Conclusions

The first wave of the COVID-19 pandemic had a considerable impact on the mental health of HCWs in Arab countries, and this was aggravated by particular geopolitical situations of some of the countries and social norms during Ramadan. Being a physician, a young HCWs, and long working hours are risk factors for greater psychological impact .

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Impact de la première vague de la pandémie de COVID-19 sur la santé mentale des agents de soins de santé dans 12 pays arabes

Résumé

Contexte : La pandémie de COVID-19 a eu un impact important sur la santé publique dans le monde entier, notamment sur les agents de santé et les systèmes de soins de santé.

Objectifs : Étudier l'impact psychologique associé à la COVID-19 sur les agents de santé dans 12 pays arabes.

Méthodes : Il s'agissait d'une enquête transversale en ligne, réalisée en milieu hospitalier entre le 4 mai et le 8 juin 2020. Nous avons évalué le stress, la dépression, l'anxiété et l'insomnie à l'aide de l'échelle Dépression Anxiété Stress et de l'Index de Sévérité de l'Insomnie.

Résultats : Au total, 2879 participants de 12 pays arabes ont répondu à l'enquête. L'anxiété, la dépression, le stress et l'insomnie ont été respectivement signalés par 48,9 %, 50,6 %, 41,4 %

et 72,1 % des répondants. La prévalence de tous les résultats psychologiques était significativement plus forte dans les pays à revenu intermédiaire de la tranche inférieure et les pays à revenu faible que dans les pays à revenu élevé. La prévalence des symptômes de santé mentale était plus élevée chez les agents de santé âgés de 30 à 39 ans, ceux qui travaillaient plus de 44 heures par semaine et ceux qui étaient en contact avec des cas de COVID-19, ainsi que chez les agents de santé qui n'étaient pas satisfaits des mesures de prévention. La prévalence des symptômes de santé mentale était plus faible chez les agents de santé de sexe masculin.

Conclusion : La COVID-19 a eu un impact considérable sur la santé mentale et psychologique des agents de santé dans les pays arabes. Cette situation a été aggravée par la situation géopolitique de certains pays arabes et les normes sociales habituellement observées pendant le mois de Ramadan. Le fait d'être médecins, jeunes agents de santé et les longues heures de travail étaient des facteurs de risque d'un plus grand impact psychologique de la pandémie.

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