MONITORING BURNOUT IN THE INTENSIVE CARE UNIT AND EMERGENCY DEPARTMENT DURING THE COVID-19 PANDEMIC: THE SAUDI ARABIAN EXPERIENCE

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Received: September 2020; Accepted: October 2020; Published: November1, 2020
Citation: Rasha Slmubark et al. Monitoring Burnout in the Intensive Care Unit and Emergency Department during the COVID-19 pandemic: the Saudi Arabian Experience. Middle East Journal of Nursing 2020; 14(2):12-21. DOI: 10.5742/MEJN2020.93790

Abstract

Background: Burnout among healthcare workers (HCWs) is a prolonged unhealthy response to chronic interpersonal and emotional stress originating in the workplace. Prior to the coronavirus disease 2019 (COVID-19) pandemic, burnout was prevalent among HCWs in many intensive care units (ICUs) and emergency departments (EDs) around the world. In the present study, we aimed to evaluate the prevalence of burnout among nurses working in the ICU and ED in Saudi Arabia during the COVID-19 crisis, and to investigate efforts that can be made to decrease the levels of burnout while the pandemic continues.

Methods: This work presents an interim analysis of data from one clinical site belonging to a larger study. An online anonymous survey was developed to measure the following domains: personal factors, occupational factors, personal opinions related to COVID-19, and burnout level. A link to this survey was distributed to ICU and ED nurses at four clinical sites by the site principal investigator. Data from one site were obtained and a descriptive interim analysis was conducted using R software.

Results: Forty-seven surveys were available for analysis. A majority (81%) of respondents worked in the pediatric ED, and 40% had worked over 80 hours in the past two weeks. Seventy percent of the subjects expressed they were afraid of infecting people at home with COVID-19, and 68% expressed fear of becoming infected themselves. Overall, 30% of respondents were classified as having moderate burnout, while only 11% had high burnout levels.

Discussion: Although burnout was prevalent in many ICUs and EDs before COVID-19, it is now more important than ever to manage and prevent it to maintain a robust healthcare workforce. The numbers from our study indicate a high prevalence of burnout among Saudi Arabian nurses, and are comparable to studies among European HCWs during the COVID-19 pandemic. A question is raised as to whether burnout is an inevitable response to working in healthcare and, in that case, what levels of burnout can be considered acceptable. A new approach is needed to monitor burnout among HCWs and implement policy interventions to reduce and prevent it.

Key words: Occupational health, burnout, nurse, intensive care unit, COVID-19, disease outbreak, Saudi Arabia.

Introduction

Burnout among healthcare workers (HCWs) has been defined as a prolonged deleterious response to chronic interpersonal and emotional stress arising from attending to patients as part of their work (1). Workplace circumstances that increase the risk of burnout include expending excessive effort and time at work without having enough subsequent recovery time to stabilize to normal (1).

A formalized measurement for burnout was established with the Maslach Burnout Inventory (MBI), which allowed measurement and study of burnout (1,2). Burnout is now recognized as an occupational hazard in healthcare, and is linked to many negative outcomes, including decreased HCW wellbeing, quality of care provided, and patient safety, among others (1). Most importantly, burnout in HCWs leads to the depletion of the workforce. Studies reveal a pattern where burned out HCWs have a high rate of job turnover and low job satisfaction (3,4). Burnout among HCWs also leads to absenteeism, since the worker develops symptoms that lead them to stay home from work (5,6). Burnout is also a factor influencing intention of early retirement in HCWs (7).

Prior to the global coronavirus disease 2019 (COVID-19) pandemic, there were already issues with high rates of burnout in healthcare workforces in different countries, especially among critical care nurses and HCWs in intensive care units (ICUs) and emergency departments (EDs) (8,9). These issues were exacerbated at the beginning of the COVID-19 epidemic, especially in areas that were hit hard, such as China (10). Since Wuhan, China, was the initial epicenter of the epidemic, the Chinese government dispatched over 40,000 HCWs to work in field hospitals in Wuhan and Hubei province (10). Since many field hospitals were deployed early in the outbreak in China, there was little knowledge of infection control around COVID-19 (10,11). Although personal protective equipment (PPE), isolation, disinfection of surfaces, and other measures were recommended, it was not clear that there was sufficient PPE for the workers early in the outbreak, and that there was sufficient knowledge of infection control measures (10,11). Sadly, over 3,000 Chinese HCWs became infected with COVID-19 and there were 22 deaths (10). Reviewing this situation, researchers found that not only were there issues with PPEs and infection control knowledge among HCWs, there was also mounting pressure on them due to work intensity and lack of rest, and this could have contributed negatively to their outcomes (10). This issue highlights the challenges of managing an ongoing pandemic such as COVID-19, where HCWs need to work long hours and learn a new protocol, are exposed to potential infection, and may not have all the supplies necessary throughout the crisis.

Researchers have studied the impact of COVID-19-related stay-at-home and other policies on the general public, and have found serious mental health consequences (12). Alkhamees and colleagues conducted an anonymous survey of the general public in Saudi Arabia using an online social media administration approach, and found that HCWs, women, students, and those with poor self-reported health scores were more likely to experience higher levels of stress, anxiety, and depression (13). This highlights the humanity of HCWs and the fact that, similarly to everyone else, they are also suffering because of the disruptions in their families and lifestyle due to COVID-19.

Saudi Arabia may have been better positioned than other countries to respond to COVID-19 (14). Saudi Arabia has experience with implementing changes to the healthcare system to respond to viral outbreaks during the Middle East Respiratory Syndrome (MERS)-related public health emergency, and has studied the impact on its health professionals (15,16). However, even though this experience has led to an extensive well-managed public health infrastructure, there are still lingering issues. Alsahafi and Cheng surveyed HCWs in Saudi Arabia in 2015 after what had been a prolonged MERS outbreak that started in 2012 (15). Their sample was comprised of approximately 57% nurses, and the rest were physicians and other HCWs (15). In this survey, researchers found that 61% of HCWs reported anxiety about contracting MERS, and among those who had been investigated for suspected MERS, half of them reported decreases in performance after the investigation (15). In the study, HCWs also seemed not to be well-informed about MERS: less than half of the physicians and only about 30% of the nurses and other HCWs were aware that MERS could be asymptomatic (15). The authors concluded that the knowledge about MERS in this occupational cohort was poor, and that better training to use PPEs and other infection control methods was needed (15). Another study of MERS knowledge in HCWs in the Najran region of Saudi Arabia was conducted more recently, and showed a similar result, with only 51% of participants having sufficient knowledge of MERS (16).

In Saudi Arabia, the healthcare workforce is comprised of both Saudis, and ex-patriate “non-Saudis” who are employed as guest workers. The greater proportion of the ICU and ED nurses in Saudi Arabia is made up of non-Saudis, although Saudis are welcome to work in these roles (17). Saudi Arabia’s healthcare system consists of a large, well-networked public system with medical cities centered in urban areas, with more distant regions served by primary healthcare centers (18). All healthcare services are offered to citizens by the government and to non-citizens through their employers. Starting on March 2, 2020, when Saudi Arabia saw its first case of COVID-19, Saudi’s health authority began implementing containment policies, and ordered that all individuals in Saudi Arabia would receive COVID-19 treatment free of charge. (19). However, cases climbed from 1,563 on April 1 to over 20,000 on April 29 (19). By summer, community transmission was brought under control and stabilized, and containment policies continued (19). Although the initial outbreak was under control, there was still risk of viral transmission through the population, and the disease continued to be deadly for some (19).

Management of COVID-19 patients in the ICU and the ED puts a high demand on HCWs because of the severe complications (20). Pre-COVID-19, Alharbi and colleagues surveyed 150 critical care nurses in Saudi Arabia and reported that they had moderate to high levels of burnout, and experienced low job satisfaction (21). A more recent study of anxiety in HCW in Saudi Arabia of those working during COVID-19 found that nurses were experiencing higher anxiety than other professions (22). It anticipated that, like with China, Saudi Arabia will need to plan for the situation of burnout becoming chronic in this workforce, which will be needed into the future. Now is the time to make efforts to prevent the progression of burnout in these HCWs to avoid as this could lead to a shortage of workers. Therefore, we conducted a study to evaluate the prevalence of burnout among nurses working in a public hospital in Saudi Arabia during COVID-19, and discussed the efforts that could be made to reduce the likelihood of continued burnout.

Methods

This study represents an interim analysis of data being collected as part of a larger study involving four medical centers in Saudi Arabia. The larger study is a cross-sectional survey of HCWs in ICUs and EDs in Saudi Arabia who are working during COVID-19 pandemic.

Participants and study setting

This study is being conducted at four public medical centers in Saudi Arabia. To be eligible to participate in the survey, respondents must be licensed nurses who are HCWs in an ICU or ED in one of these four public medical centers. Also, they need to have worked in the past two weeks in their position at the public medical center.

Questionnaire

The survey contained the following domains: personal factors, occupational factors, personal opinions related to COVID-19, and a measurement for burnout.

Personal and occupational factors

The survey asked about personal and occupational factors that constitute risk factors for burnout: age in years, sex (male or female), citizenship (Saudi or non-Saudi), number of adults and children in the household, primary practice location, number of clinical hours worked in the past two weeks, frequency of night shift work, length of shifts, treating or not treating COVID-19 patients at work, dealing or not dealing with end-of-life issues at work, and years of experience working in ICU or ED (1,10).

Personal opinions related to COVID-19

Respondents were asked to rate their agreement with eight statements on a scale of 1 to 5, with 1 meaning Strongly Disagree and 5 meaning Strongly Agree. No other anchoring labels were given to the levels of 2, 3, and 4, so these were added: 2 = Somewhat Disagree, 3 = Neither Agree nor Disagree, and 4 = Somewhat Agree). The statements were derived from fears reported by HCWs in China during the COVID-19 epidemic and from the burnout literature, and included not being able to control work schedules, shifts being too long, being afraid of getting COVID-19 due to lack of PPE, being afraid of not having access to a COVID-19 test, being afraid of getting sick and not being able to work, being afraid of getting sick and even dying which would cause a problem for the family, and bringing home COVID-19 infection to housemates (1,10).

Respondents were also asked what strategies they use to de-stress from work, since those can impact on burnout, and were given a checklist (23–26). The strategies "Exercise", "Meditation", "Engage in sports", "Prayer", and "Taking courses/education" were chosen for analysis because we considered that these could be promoted by workplace policies.

Burnout measurement

To measure burnout, the emotional exhaustion (EE) subscale of the Maslach Burnout Inventory-Human Services Survey (MBI-HSS) was used (2,27). This includes seven statements about how the HCW feels at work, which are rated with the following scale: 0 = Never, 1 = A few times per year, 2 = Once a month, 3 = A few times per month, 4 = Once a week, 5 = A few times per week, and 6 = Every day. An example statement is: "I feel emotionally drained by my work". The EE subscale is scored by adding together the points associated with the ratings for each statement. Scores of 17 or less are considered low burnout, scores of 18 through to 29 are considered moderate burnout, and scores of 30 and greater are considered high burnout.

Survey administration

The data of the larger study are still being collected anonymously through the online survey software, QPlatform (28). Data collection is currently taking place at four clinical sites which are public medical centers with multiple ICUs and EDs. For each site, the site principal investigator receives a unique link for the survey for respondents at that site. This site principal investigator e-mails this link to HCWs in the ICU and EDs at the site and encourages them to complete it. The study is anticipated to be completed in early 2021. The data analyzed here were collected from one of these four sites, a large hospital with over 1,000 beds, between August 22 and September 7, 2020, and included 50 respondents.

Data analysis

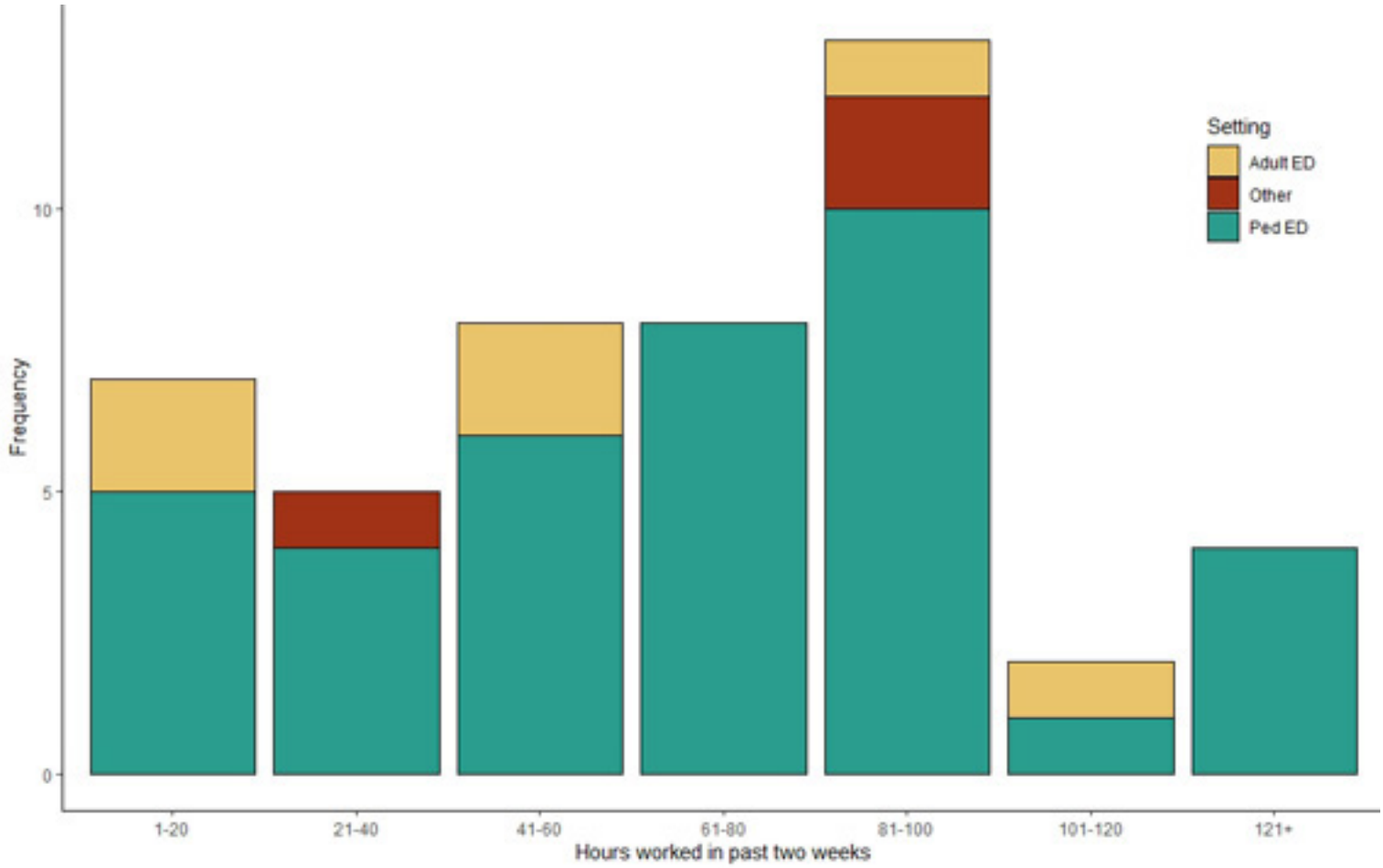
Data analysis was performed with R (29). ggplot2, Likert and upsetR packages were used for data visualization.

Results

At the time of the interim analysis, 50 records were available from one study site. Three records were missing data and were removed, leaving 47 complete records for further analysis. The distribution of number of hours worked in the past two weeks among those who responded was skewed left (see Figure 1).

As shown in Figure 1, most of the nurses completing the survey were from the ED setting, not the ICU. Table 1 (page 32) provides a descriptive analysis of the participants in the survey.

Figure 1: Figure 1. Distribution of hours worked in the past two weeks. Adult ED = adult emergency department, Ped ED = pediatric emergency department.



As shown in Table 1, most of the respondents worked in the pediatric ED (n = 38, 81%), were less than 35 years of age (n = 26, 55%), were female (n = 41, 87%), and were non-Saudi (n = 44, 94%). Very few lived alone (n = 4, 9%), and most lived in households without children (n = 39, 83%). Over two thirds had more than five years of experience working in the ED (n = 32, 68%). In the two weeks before they completed the survey, over half of the respondents reported treating COVID-19 patients (n = 29, 62%), and another fifth said they treated patients without knowing their COVID-19 status (n = 10, 21%). Over three quarters had worked more than twice on the night shift in the past two weeks (n = 37, 79%). Overall, a majority of the survey participants were in the low burnout category, but 14 (30%) had moderate burnout, and 5 (11%) were experiencing high burnout.

Because the questions were about work over the last two weeks, and considering a full-time work week at 40 hours, we classified the sample as to those working 80 hours or more in the past two weeks, and compared them to those who worked less than 80 hours in the past two weeks. A total of 19 (40%) respondents worked 80 or more hours in the past two weeks and, among those, five (26%) were experiencing moderate burnout, and 2 (11%) were experiencing high burnout. However, the sample was too small for bivariate testing, and no discernable patterns emerged.

Figure 2 shows the distribution of responses to Likert-scale questions about COVID-19, providing a visual depiction of the responses to the eight statements on opinions about COVID-19.

The statements that were rated are listed along the y-axis of the figure, and each bar corresponds to the distribution of ratings. The center vertical line marks the neutral choice, “Neither Agree nor Disagree”. The grey field represents the percentage of respondents who chose this neutral choice (which was 3 on the survey) as their response to the statement, and this percentage is listed on the grey field. To the right, the light and dark green fields indicate the percentage of sample choosing either 4 or 5 (labeled “Somewhat Agree” or “Strongly Agree”) as their statement rating (see legend), and this percentage is printed on the right side. On the left side, the light and dark gold fields indicate the percentage of sample choosing either 1 or 2 (labeled “Somewhat Disagree” or “Strongly Disagree”) as their rating (as shown in the legend), with the percentage listed on the left side. The statements are arranged in order of the largest percentage of the ratings of 4 and 5 together downward.

As shown in Figure 2, four of the eight statements had over 50% agreement as seen on the right side of the figure. The largest was 70% agreement with the statement, “I am afraid of getting COVID-19 at work and bringing it home to my household and infecting people there.” The people in the household were more

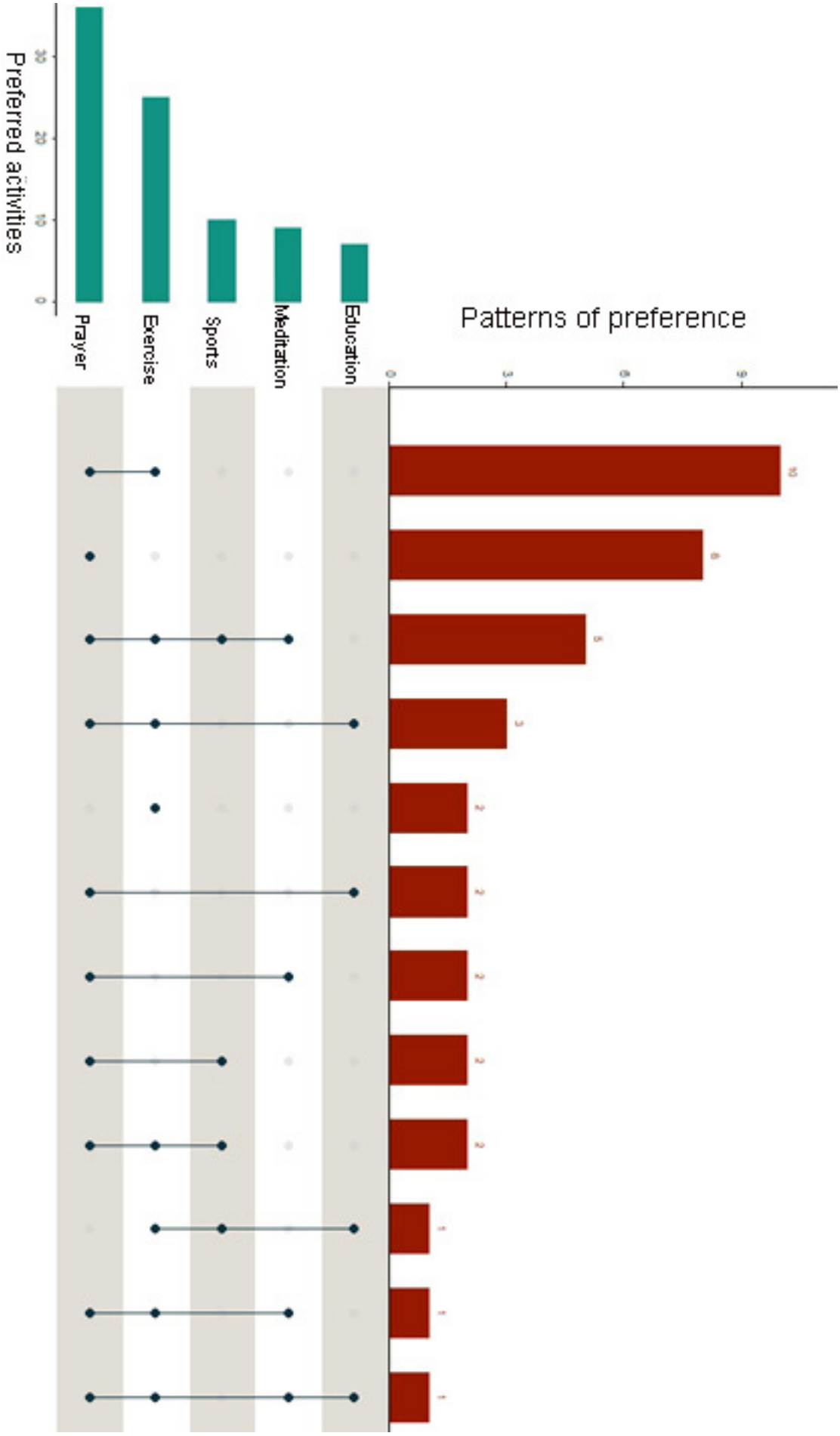
Table 1. Descriptive analysis of the sample

Category	Level	Total n, %	Worked up to 80 hours in previous two weeks n, %	Worked 80 + hours in the previous two weeks n, %
All	All	47, 100%	28, 60%	19, 40%
Primary practice setting	Pediatric emergency department	38, 81%	23, 82%	15, 79%
	Adult emergency department	6, 13%	4, 14%	2, 11%
	All others*	3, 6%	1, 4%	2, 11%
Age group	< 35 years	26, 55%	18, 64%	8, 42%
	35 to 44 years	11, 23%	6, 21%	5, 26%
	45 years and older	10, 21%	4, 14%	6, 32%
Gender	Female	41, 87%	25, 89%	16, 84%
	Male	6, 13%	3, 11%	3, 16%
Citizenship	Saudi	3, 6%	25, 89%	16, 84%
	Non-Saudi	44, 94%	3, 11%	3, 16%
Adults in household	Lives alone	4, 9%	3, 11%	1, 5%
	Lives with one to three other adults	30, 64%	18, 64%	12, 63%
	Lives with more than three other adults	13, 28%	7, 25%	6, 32%
Children in household	No children in household	39, 83%	24, 86%	15, 79%
	One to two children in household	6, 13%	3, 11%	3, 16%
	More than two children in household	2, 4%	1, 4%	1, 5%
Emergency department experience	Less than one year	1, 2%	1, 4%	0, 0%
	One to five years	13, 28%	6, 21%	7, 37%
	More than five years	32, 68%	20, 71%	12, 63%
	Never worked in emergency department setting	1, 2%	1, 4%	0, 0%
Treating COVID-19 patients at work in past two weeks	Yes	29, 62%	17, 61%	12, 63%
	No	7, 15%	5, 18%	2, 11%
	I treated patients, but I did not know the COVID-19 status of the patients I treated	10, 21%	5, 18%	5, 26%
	I did not treat any patients at work in the last two weeks	1, 2%	1, 4%	0, 0%
How often worked on night shift in past two weeks	Not at all	8, 17%	4, 14%	4, 21%
	Once or twice	2, 4%	2, 7%	0, 0%
	More than two times	37, 79%	22, 79%	15, 79%
Burnout levels	Low	28, 60%	16, 57%	12, 63%
	Moderate	14, 30%	9, 32%	5, 26%
	High	5, 11%	3, 11%	2, 11%

* In a pool of nurses working among different emergency departments (1), In a pool of nurses working among intensive care units and emergency departments (1), and pediatric intensive care unit (1).

Figure 2. Distribution of opinion on Likert-scale statements. This provides a visualization of the responses to the eight statements about COVID-19 that respondents rated. The statements are listed along the y-axis, and each bar corresponds to the distribution of answers. The center vertical line indicates the neutral choice, “Neither Agree nor Disagree”. The grey area represents the percentage of respondents who chose this level as their response to the statement, and this percentage is listed on the grey area. To the right, the light and dark green indicate the percentage of sample choosing “Somewhat Agree” or “Strongly Agree” as their response to the statement (as shown on the legend), and this percentage is listed on the right side. On the left, the light and dark gold indicate the percentage of sample choosing “Somewhat Disagree” or “Strongly Disagree” as their response (per the key on the figure), with the percentage listed on the left.

Figure 3. Pattern of preferred activities to destress from work. This provides an upset plot showing the patterns preferred activities for destressing from work.



likely to be other adult non-Saudis who are in Saudi Arabia for work purposes (Table 1). The second largest agreement (68%) was with the statement, "I am afraid of getting severely ill or even dying from COVID-19, because then it will create a problem for my family." The third statement "I am afraid of getting COVID-19, getting sick, and not being able to work" had a 57% agreement, and the fourth statement "I am not able to control my work schedule" presented a 51% agreement. The statements with the lowest levels of agreement were: "My shifts are too long" (36%), "At work, I have to deal with a lot of end-of-life issues" (32%), "I am afraid of getting COVID-19 because our practice location does not have enough PPE" (30%), and "I am afraid of getting COVID-19 and not being able to be tested due to limits on testing" (26%).

Responses to the question "What strategies do you use to destress from work?" are visualized in Figure 3. By far, prayer and exercise are the most popular ways to destress from work, much more popular than education, meditation, and sports. In fact, the pattern of preferring both exercise and prayer was the most prevalent pattern.

Discussion

In our interim analysis including 47 ICU and ED nurses from a public hospital in Saudi Arabia working during COVID-19, the combined prevalence of moderate or high burnout was 41%, with 11% for high burnout alone. These numbers are difficult to benchmark and interpret, because burnout has been endemic in healthcare globally for decades (30,31). It is not clear whether this numerical rate is materially different from what was found in the survey of 150 critical care nurses in Saudi Arabia before the outbreak, which showed high rates of moderate and high burnout, and low job satisfaction (21). But because the respondents also reported working frequent, long shifts, including night shifts, and because COVID-19 is not abating soon, these burnout rates are expected to rise. This could mean that Saudi Arabia, similar to other nations, might see the burnout of their healthcare workforce during a global pandemic if interventions are not implemented immediately.

This leads to the question: Is there an acceptable level of burnout? And if we are lowering it, what should be our target? A survey of intensivists in Europe working during COVID-19 used the MBI-HSS and found that 51.8% had an overall score indicating high level burnout, with an additional 23% having moderate burnout (30). Spanish researchers used the MBI-HSS to measure burnout in 1,422 HCWs in Madrid who were working during COVID-19 and for EE, they found a rate of 41% in the high burnout category, and 23.1% in the moderate burnout category (32). These findings are consistent with the study mentioned earlier, where among HCWs in Saudi Arabia working during COVID-19, nurses had a comparatively higher anxiety level (22). These numbers look both unacceptable and unsustainable, and make the numbers that come from this smaller sample in Saudi Arabia look better. But this does not answer the question of what the right numbers should be.

Contracting COVID-19 on the job and bringing it home to infect others, as well as workers getting sick themselves, are realistic fears for these individuals. While it is encouraging that only about a quarter of respondents said they feared they could not get tested if needed, these areas still provide an opportunity to improve and reduce the reasons for their fears. Focusing on these areas can also improve control of the spread of COVID-19 in general, is it is often transmitted through the HCW population. Even well-intended hospital management in Saudi Arabian may not realize that their staff is lacking knowledge, as was observed by the studies on the MERS outbreaks (15,16). There may be testing or PPE available, but the HCWs may not know the policies well, or understand the reasons for them. Simply ensuring that HCWs are well-educated on the policies and protocols would help them adjust their risk assessments and hopefully give them a better sense of control over their environment.

Policy interventions could help with this issue in ways other than simply ensuring that protocols and policies are known and followed. COVID-19 fears in HCWs could be mitigated by ensuring the highest level of safety and protection from infection in their occupational environment. Additional monetary and practical support for workers who contract COVID-19 at work could reduce the fear of getting sick and not being able to perform their job. Supplying adequate PPE and removing all barriers to HCWs being tested would help reduce these realistic fears. Also, giving workers more control over their schedule would not only reduce the situation with having too many shifts, too many night shifts, and too long shifts, but would also provide the worker some locus of control.

Even with these policy interventions to reduce potential risk factors, since HCW COVID-19 fears are realistic, HCWs in this situation will likely be anxious regardless of what is done in the environment. This means that it is important to make the environment less stressful. The most popular pattern of destressing activities reported in the activities we analyzed was "prayer" and "exercise". Setting aside private, dedicated spaces in the workplace for prayer, stretching and using exercise equipment could help this group, as long as they are provided time and ability to access it.

This discussion, however, skirts a larger issue, which is what the actual number should be when we are measuring burnout rates in HCWs. Even if we create an ideal workplace, it might not be reasonable to bring this rate to zero because burnout is a personal reaction. It has been suggested that HCW burnout in the ICU and ED should be seen in the way that errors rates are seen in a laboratory: as an inevitable outcome of the system, meaning that it is our responsibility to manage them, and make them as low as possible (33). This suggests that there is no official target number for rate of burnout, but that benchmarking should be done, as we have to try to troubleshoot ways to lower it. Especially during COVID-19, burnout should be seen as a chronic workforce problem that needs to be continually managed and kept within control limits.

In conclusion, our interim analysis of survey data from ICU and ED nurses working in a public hospital in Saudi Arabia during the COVID-19 pandemic showed that 41% were experiencing either moderate or high burnout, and that they feared getting the disease, and bringing it home and infecting their household. Health care authority needs to put every possible effort into supporting our healthcare workforces during the COVID-19 crisis, so that there is no shortage of workers before the pandemic resolves.

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