

STRESS REACTIONS AND COPING STRATEGY AMONG HEALTHCARE PROFESSIONALS DURING COVID-19 OUTBREAK

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SUMMARY

Background: Psychological impacts among healthcare professionals have increased significantly due to the increasing number of COVID-19 cases. This study aimed to identify stress and coping strategies among healthcare professionals in Saudi Arabia during the COVID-19 outbreak.

Subjects and methods: A cross-sectional study online survey was conducted for health care professionals during a peak of COVID-19 from March to June 2020 at different healthcare institutions at KSA (n=342).

Results: Sixty-five percent of responders often and always feel fears about infection and subsequent effects on themselves, the patient, and the family. 57% of them stated that they felt sometimes depressed mode and 47% anxiety during the outbreak. Eighty-four percent of the respondent always focusing on prevention as the first biosecurity measures such as hand-washing habits and using hand sanitizer, and 38.3% of them make sometimes relax and rest. While half of the responses (50%) sometimes had physical exercise. Also, thirty-eight percent joined sometimes community and/or group online chat groups, and 56.1% always keep contact with family and friends through social messaging or phone calls.

Conclusion: Understanding this topic is important for healthcare organizations, effective strategies, and programs is needed to provide holistic staff care and wellbeing during outbreaks that focus on the value of mental and emotional support.

Key words: COVID-19 - coping strategy - healthcare professionals - outbreak, stress

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INTRODUCTION

Coronavirus Disease-2019 (COVID-19) outbreak began in Wuhan, China in December 2019. According to reports from December 2019 to March 2020, COVID-19 has resulted in 665,295 total cases and 30,900 deaths globally (Worldometer 2020). The virus has spread widely across the world and on 11 March 2020, it was recognized as a pandemic by the World Health Organization (WHO 2020). This virus is highly contagious which typically spreads during close contact and via respiratory droplets. The coronavirus has affected 194 countries around the world, as of March 2020, China was the first affected country, which has so far recorded more than 81,439 total cases and 3,300 deaths, meanwhile, in Europe COVID-19 is getting severe in Italy, making it the most affected country after China with total coronavirus cases more than 92,472 and more than 10,023 deaths (Worldometer 2020). However, the US overtook China and Italy recently as a country with the highest number of confirmed COVID-19 cases (total number of confirmed cases over 123,780, and 2,229 deaths) (WHO 2020).

On March 2, 2020, the Kingdom of Saudi Arabia reported the first confirmed COVID-19 case to the World Health Organization. The Ministry of Health working closely with other stakeholders, to respond to

this public health threat by taking precautionary measures. For example, Saudi Arabia suspended operations in many government agencies, schools, and universities. However, the rapid spread of COVID-19 has increased the number of new cases globally as the coronavirus outbreak worsens. Also, more than 1,203 cases of COVID-19 had been reported in Saudi Arabia as of March 2020, which resulted in 4 death cases and more than 37 recoveries (MOH 2020). This rapid rise in COVID-19 cases has a physiological impact on the community and specifically among healthcare professionals who worked during this outbreak.

The high rate of death and the rapid spread of the virus put healthcare professionals who are working on the frontline under tremendous stress (Wu et al. 2009). Healthcare professionals who treat patients infected with infectious diseases and managing quarantines often face mental health problems. Being vulnerable to both high risk of infection and post-traumatic stress makes some of them experience fear of contagion and spreading the virus to their loved ones (Xiang et al. 2020). A 2005 study of 26 female nurses from the SARS team who looked after SARS patients in the emergency department of a medical center in northern Taiwan found that a majority of respondents suffered from stress-related to worries about their colleagues and family members, and they felt that their well-being was

threatened. Also, around 31% reported experiencing a mixture of various negative feelings such as anxiety, fear, and loss of control (Lee et al. 2005). The number of healthcare professionals who died since the COVID-19 epidemic has also increased recently. At least 70 doctors and 50 nurses have died from coronavirus in Indonesia (Massola & Rompies 2020), and 23 Italian doctors (Chow & Saliba 2020). Worldwide more than 600 nurses have died from COVID-19 and about 7% of all COVID-19 cases are among health care workers (Saudi Gazette 2020). Also, the WHO reported on April 21, 2020, that over 35, 000 health workers were infected with COVID19 (WHO 2020). The study aims to identify stress and coping strategies among healthcare professionals during the COVID-19 pandemic at healthcare institutions in Saudi Arabia.

SUBJECTS AND METHODS

Study Design & setting

A descriptive, cross-sectional study was designed and conducted among healthcare professionals at healthcare institutions in the Kingdom of Saudi Arabia between March to June 2020 through an online survey questionnaire sent via email to all healthcare professionals working during the COVID-19 pandemic.

Study population

All healthcare professionals who are working during the COVID-19 pandemic in Saudi Arabia were invited and a total of 342 participants were included in the study. Staff members who were on leave, not willing to participate and non-healthcare professionals were excluded from the study population.

Procedure and ethical considerations

A self-administered survey was sent via email to all healthcare professionals for accessing the web-based study with the aim of the study, consent form, and the right to withdraw. Voluntary participation, confidentiality, and anonymity were maintained throughout the study process. The study was approved by the Institutional Review Board of King Fahad Medical City (IRB number: 20-236), and there was no conflict of interest.

Study instruments

The questionnaire was composed of three sections. The first section included demographic details, including age, gender, year of experience, department, and profession. In contrast, the second part tried to elicit the respondents' emotions and feeling during the COVID-19 outbreak, the third part asked the respondents to state the coping strategy followed to alleviate the stress during the COVID-19 outbreak.

Reliability and validity of the questionnaire

The questionnaire was developed and reviewed by multiple expert panels, including researcher, ethics, quality, and biostatistics experts. A pilot study was conducted for the pre-final version of the questionnaire on 25 participants to measure the validity through the test and retest analysis. The assessments of the reliability and internal consistency of the survey were performed using Cronbach's alpha test, and it was estimated at 0.80.

Sample Size and Statistical Analysis

The current COVID-19 pandemic related to Staff emotions and feelings during the outbreak, stress-reducing factors, and coping strategies were presumed to be affecting 50% of the health care workers. Therefore, the supposed 50% incidence at a 95% confidence interval, 80% power in the study, and applied finite population correction estimated an optimal sample size of 278 for this study. Age and Work experience were the only two demographic quantitative variables that were measured in years and were described as Mean \pm SD and Median. All other variables were expressed as frequency percentages. Mean \pm SD represented the four-point ordinal measurements for staff emotions and feelings during its outbreak, stress-reducing factors, and coping strategies score. Chronbach's alpha measured Intra-class correlation coefficients (ICC) among the 14 items about staff emotions and feelings during COVID-19 Outbreak. Similarly, ICC was measured for all the 23 questions related to coping strategy that staff followed to alleviate the stress of the COVID-19 Outbreak. Both the reliability scores were considered suitable for bearing within the range of 0.75 to 0.90. However, the three items for purposefulness were measured on an eleven-point scale, and their ICC predicted moderate reliability. Microsoft Excel and Statistical Package for the Social Sciences (SPSS) 25.0 software were used for data analysis.

RESULTS

Descriptive Statistics

A total number of 342 received a complete response from health care professionals. Of those, 221 (64.6%) were female, and 121 (35.4%) males, with a mean age of 38 years. Most of them working in emergency departments 136 (39.8%) followed by staff from inpatient units 65 (19%), then outpatient units 41 (12%), and other places of work (10.8%). The majority of the participants were from Riyadh city (79.5%), followed by Jeddah (11.1%), and Dammam (3.2%). Nurses comprised over half of the respondents (61.4%), and the remaining 21.1% were physicians and 17.6% are among allied healthcare professionals in different settings. The majority of the respondents had worked an average of thirteen to seven years of total experience in a clinical setting (See Table 1).

Table 1. Demographic Characteristics (N=342)

Characteristic - description	n (%)
City	
Dammam	11 (3.2)
Jeddah	38 (11.1)
Jubail	5 (1.5)
Makkah	8 (2.3)
Medina	4 (1.2)
Qatif	4 (1.2)
Riyadh	272 (79.5)
Gender	
Female	221 (64.6)
Male	121 (35.4)
	Mean ± SD
	Median (min-max)
Age (year)	38.8±8.6
Work experience (year)	13.7±7.8
Department	
Critical Care Units	25 (7.3)
Emergency Department	136 (39.8)
Inpatient Units	65 (19.0)
Laboratory	15 (4.4)
Operating room	17 (5.0)
Outpatient Units	41 (12.0)
Pharmacy Units	6 (1.8)
Other	37 (10.8)
Profession	
Anesthesia Specialist	3 (0.9)
Medical Laboratory	11 (3.2)
Nurse	210 (61.4)
Pharmacist	11 (3.2)
Physical Therapy	4 (1.2)
Physicians	72 (21.1)
Radiology Staff	2 (0.6)
Respiratory Therapist	6 (1.8)
Other allied healthcare	23 (6.7)

Staff's emotions and feeling during the COVID-19 outbreak

We used Likert-style questions to measure an underlying latent variable that cannot be measured precisely, and for analysis, we used Cronbach's alpha which provided a value of 0.88, which explained the correctness of the test with an internal consistency of 88.6%.

Nearly 65% (n=223) of the responders stated that they were always and often fears about infection's subsequent effects on the self, the patient, and the family. More than half of the responders (57%) stated that they felt sometimes depressed mode during the COVID-19 outbreak, while 58 (17%) never had this feeling. Furthermore, 113 (33%) of the respondents stated that they always fear contact with those treating patients with COVID-19 followed by 115 (33.6%) who had sometimes this feeling. On the contrary, 141 (41.2%) of them always wearing a mask and protective equipment, even in open spaces, followed by "sometimes" (25.1%). Meanwhile, 133 (38.9%) stated that sometimes they were read or watch COVID-19 related information while 82 (24%) always read or watch.

Forty-seven (47.1%) of participants reported that sometimes felt anxiety. Moreover, respondents have also reported that sometimes suffer from poor concentration (43.6%). A similar number of 43.6% report having sometimes exhaustion. Interestingly, 189 (55.3%) of respondents mentioned that never avoided COVID-19-related information. Meanwhile, 188 (55%) of all respondents never feel the reluctance to work or considered resignation during the outbreak. In addition to this, 213 (62.3%) of them have never increased their usage of coffee, tobacco, or other medicines (See Table 2).

Table 2. Staff emotions and feeling during COVID-19 Outbreak

Characteristic	Never	Sometimes	Often	Always	Mean ± SD
Fears about infection and subsequent implications for self, patients, and family	14 (4.1)	105 (30.7)	87 (25.4)	136 (39.8)	2.0±0.9
Depressed mood	58 (17.0)	196 (57.3)	61 (17.8)	27 (7.9)	1.2±0.8
Fear of contact with those treating patients with COVID-19	44 (12.9)	115 (33.6)	70 (20.5)	113 (33.0)	1.7±1.1
Wear a mask and protective equipment, even in open spaces	31 (9.1)	86 (25.1)	84 (24.6)	141 (41.2)	2.0±1.0
Invest a majority of free time reading or watching COVID-19 related information	22 (6.4)	133 (38.9)	105 (30.7)	82 (24.0)	1.7±0.9
Anxiety	52 (15.2)	161 (47.1)	78 (22.8)	51 (14.9)	1.4±0.9
Poor concentration	140 (40.9)	149 (43.6)	42 (12.3)	11 (3.2)	0.8±0.8
Exhaustion	65 (19.0)	149 (43.6)	69 (20.2)	59 (17.3)	1.4±1.0
Avoided COVID-19-related information	189 (55.3)	119 (34.8)	26 (7.6)	8 (2.3)	0.6±0.7
Reluctant to work or considered resignation	188 (55.0)	115 (33.6)	26 (7.6)	13 (3.8)	0.6±0.8
Changes in appetite, energy, and activity levels	119 (34.8)	155 (45.3)	54 (15.8)	14 (4.1)	0.9±0.8
Increased use of coffee, tobacco, or other drugs	213 (62.3)	76 (22.2)	31 (9.1)	22 (6.4)	0.6±0.9
Physical reactions, such as headache, body pain, stomach problems, and skin rash	141 (41.2)	134 (39.2)	41 (12.0)	26 (7.6)	0.9±0.9
Insomnia	133 (38.9)	135 (39.5)	53 (15.5)	21 (6.1)	0.9±0.9

Chronbach's alpha = 0.886 (Internal consistency = 88.6%)

Table 3. Coping strategy that staff followed to alleviate the stress of COVID-19 Outbreak

Dimension - characteristic	Never	Sometimes	Often	Always	Mean ± SD
Biosecurity measures					
Use of personal protective equipment	11 (3.2)	46 (13.5)	70 (20.5)	215 (62.9)	2.4±0.8
Avoid exposure to public places	8 (2.3)	60 (17.5)	108 (31.6)	166 (48.5)	2.3±0.8
Distance and isolation (restrictions on touching others, surroundings, etc.)	2 (0.6)	33 (9.6)	110 (32.2)	197 (57.6)	2.5±0.7
Using disposable scrubs	81 (23.7)	60 (17.5)	68 (19.9)	133 (38.9)	1.7±1.2
Continuous awareness regarding infection control procedures	3 (0.9)	48 (14.0)	93 (27.2)	198 (57.9)	2.4±0.8
Attend infection control education sessions	29 (8.5)	90 (26.3)	115 (33.6)	108 (31.6)	1.9±1
Stay informed by checking reliable sources	6 (1.8)	52 (15.2)	115 (33.6)	169 (49.4)	2.3±0.8
Focus on prevention (hand-washing habits, using hand sanitizer)	1 (0.3)	15 (4.4)	38 (11.1)	288 (84.2)	2.8±0.5
Potential separation from family members	53 (15.5)	94 (27.5)	92 (26.9)	103 (30.1)	1.7±1.1
Relaxation					
Make time to relax and rest	19 (5.6)	131 (38.3)	123 (36.0)	69 (20.2)	1.7±0.9
Physical Exercise	65 (19.0)	171 (50.0)	69 (20.2)	37 (10.8)	1.2±0.9
Maintain routine	26 (7.6)	111 (32.5)	123 (36.0)	82 (24.0)	1.8±0.9
Interaction					
Join the community and/or group online chat groups	69 (20.2)	132 (38.6)	89 (26.0)	52 (15.2)	1.4±1.0
Keep contact with family and friends through social messaging or phone calls	5 (1.5)	54 (15.8)	91 (26.6)	192 (56.1)	2.4±0.8
Connect with others	18 (5.3)	106 (31.0)	100 (29.2)	118 (34.5)	1.9±0.9
Chatting with other colleagues to discuss work experiences	12 (3.5)	122 (35.7)	99 (28.9)	109 (31.9)	1.9±0.9
Affirmation					
Motivating yourself to face the COVID-19 outbreak with a positive attitude	6 (1.8)	70 (20.5)	112 (32.7)	154 (45.0)	2.2±0.8
Seeking help when needed	7 (2.0)	76 (22.2)	100 (29.2)	159 (46.5)	2.2±0.9
Avoiding the use of coffee, tobacco, or other drugs	79 (23.1)	100 (29.2)	45 (13.2)	118 (34.5)	1.6±1.2
Work remotely	56 (16.4)	117 (34.2)	109 (31.9)	60 (17.5)	1.5±1
Let others know you care	8 (2.3)	53 (15.5)	108 (31.6)	173 (50.6)	2.3±0.8
Religious belief					
Prayer	2 (0.6)	15 (4.4)	29 (8.5)	296 (86.5)	2.8±0.5
Share faith	10 (2.9)	38 (11.1)	91 (26.6)	203 (59.4)	2.4±0.8
Chronbach's alpha = 0.839 (Internal consistency = 83.9%)					
Purposefulness					
To what extent do you feel that the things you do in your life have a purpose?	Median (min-max) = 9 (0-10)				8±2.3
How optimistic do you feel about the next six months?	Median (min-max) = 7 (0-10)				7±2.5
How worried are you with everything that is happening in the world these days?	Median (min - max) = 7.5 (0-10)				7.1±2.6
Chronbach's alpha = 0.602 (Internal consistency = 60.2%)					

A coping strategy that staff followed to alleviate the stress of COVID-19 Outbreak

In this part, we used Likert style questions to measure an underlying latent variable that cannot be measured exactly, and for the analysis, Cronbach's alpha was found 0.839 which indicated the reliability of the results with an internal consistency of 83.9%. There were five dimensions focused in Table 3 include biosecurity measures, relaxation, interaction, affirmation, religious belief, and purposefulness.

Eighty-four percent of the respondents reported that focusing on prevention always is the first biosecurity

measure to alleviate stress such as hand-washing habits and using hand sanitizer. Using always the personal protective equipment follows the second-highest measures frequently mentioned (62.9%). In addition to this, continuous awareness regarding infection control procedures "always" (57.9%), and (57.6%) always keep distance and isolation like restrictions on touching others, surroundings, etc.), stay always informed by checking reliable sources (49.4%) had been reported as a strategy (Table 3).

Concerning the relaxation dimensions, 38.3% of the respondents sometimes make relax and rest. While half of the responses (50%) were sometimes had physical

exercise. In terms of interaction dimensions, thirty-eight percent have sometimes joined the community and/or group online chat groups. Among all the participants, 56.1% always keep contact with family and friends through social messaging or phone calls. In addition to this, connection with others was "always" (34.5%), chatting with other colleagues to discuss work experiences, the majority responded as "sometimes" (35.7%). Basing on the affirmation dimensions result, more than half of the responders (50.6%) stated that they would let others know that they care. Additionally, (46.9%) of the respondents stated that they would seek help when needed. Meanwhile, 154 (45%) chose to motivate themselves to face the COVID-19 outbreak with a positive attitude. Moreover, three-fourths mentioned that they were always prayer followed by shared always faith (59.4%) as part of religious belief dimensions.

Furthermore, we measured the purposefulness using three questions that targeted the feeling of the staff after they follow dimensions to avoid stress in the COVID19 pandemic. The Likert style was used from 0 to 10. For the question, "To what extent do you feel that the things you do in your life have a purpose?" the median answer received was 9/10. While the question of "How optimistic do you feel about the next six months?" received the median answer of 7/10. For the last question "How worried are you with everything that is happening in the world these days?" the median answer received was 7.5/10. The Cronbach's alpha was 0.602 indicating a poor result with an internal consistency of 60.2% (See Table 3).

DISCUSSION

The study offered a unique opportunity to examine health care professionals' stress and coping strategies during the COVID-19 pandemic at healthcare institutions in Saudi Arabia. The work factors are directly significant to health care professionals particularly towards the issue of working during outbreaks which are linked to causing major stress. The global health emergency caused by the Covid-19 pandemic is probably posing one of the most significant challenges that healthcare professionals have been able to face throughout their careers (Lai et al. 2020). The coronavirus pandemic has become the hardest test for healthcare providers worldwide and subjected to anxiety, stress, and emotional burnout, due to an increasing number of coronavirus cases (Duan & Gang 2020). This outbreak is leading to stress, anxiety, depressive symptoms, insomnia, and fear globally (Torales et al. 2020). Fear of the unknown raises anxiety levels in people (Shigemura et al. 2020).

One of the previous studies showed that 53.7 % of healthcare providers were very much worried about their safety and the safety of their families and reported

psychological effects (Jiang 2020), and lack of contact with their families, and exhaustion (Kang et al. 2020). Health professionals have been facing enormous pressure, and they have decided not to go home to their families during the whole pandemic (Kang et al. 2020). In comparison with our study, the result showed that 136 (39.8%) always and 87 (25.4%) often feeling fears about infection and subsequent implications for self, patients, and family.

Further, early research suggests that this pandemic has affected the mental well-being of healthcare providers, taking care of the mental health of healthcare professionals may directly affect their performance and their ability to adequately serve their infected patients (Park & Park 2020). A study was carried out in the 34 hospitals in China (1257 health care workers surveyed), and it reported that a third of the health care workers who worked at the front lines said they had psychological problems, and the study suggests that their mental health may require special attention and may need psychological support or intervention (Lai et al. 2020). Another study conducted to explore mental health symptoms reported that between 33% and 39% of respondents experience anxiety, depression and online or telephone counseling on psychological health issues is needed (Walsh et al. 2020) similarly to a report from Russia show that healthcare workers reported a high rate of stress and anxiety during participating in treatment of COVID 19 patients (Mosolova et al. 2020) .

It was found that (57.3%) of respondent feels sometimes depressed mood and (17.8 %) often during COVID-19 outbreak our findings are similar to other study indicate that healthcare professionals working to fight the Covid-19 coronavirus are under a heavy load of stress that can have significant psychological effects (Zhang et al. 2020). Moreover, our results showed that staff followed a different strategy to alleviate the stress, for instance, 49.4% of respondents checking reliable sources to be stay informed about the last update of COVID-19. Similarly, previous studies have indicated that health care professionals who were involved in the COVID-19 epidemic followed a new psychological crisis intervention model by utilizing internet technology to help health care professionals sustain this situation to continue their sacrificial work (Zhang et al. 2020). Another study conducted to implement the programs and cabinets for the psychological care of healthcare workers should be ensured (Dai et al. 2020). Additionally, our results showed that participants expressed sometimes insomnia 39.5% and 47.1% anxiety, comparable to previous studies indicate that health care professionals reported most common symptoms were frustration, poor sleep, and feelings of tension or anxiety (Xiang et al. 2020) and sleep disturbances while fighting the epidemic due to overwork (Xiao et al. 2020).

Also, the study revealed that 62.9% of healthcare professionals always wear a mask and using protective equipment, even in open spaces as a strategy to reduce stress and prevent getting an infection. Another study conducted in China reported that the rapid increase in cases of people affected by the coronavirus and deaths throughout the world, as well as the risks they are taking due to the lack of personal protective equipment (PPE) leading to feelings of helplessness, anxiety, and depression (Zheng 2020), and anguish and stress (Lima et al. 2020). Health care professionals are regularly exposed to the fear of being infected just like any other individual (Neto et al. 2020). It was found that the respondents feel sometimes exhaustion (43.6%) vs 17.3% always exhaustions in compare to another study shown that a high degree of distress was experienced by 29–35% of hospital workers during the SARS outbreak in 2003 (Maunder 2004) and taking into account that the consequences for professionals of stress and emotional exhaustion are short, medium and long term (Jiang et al. 2020).

Our findings provide evidence that all healthcare professionals who are fighting against the pandemic should be rearmed by design a generalized plan of psychological support for the healthcare professional in the face of stress and the emotional burden of dealing with the many extreme situations that occur daily between life and death. Also, it would be necessary to establish a protocol and prepare an action for post-traumatic.

Furthermore, the telephone hotline should set up to provide psychological support for health professionals who need it to reduce and control stress and anxiety caused by the overload of work and avoid the development of symptoms and mental problems. The social support of health care professionals affects indirectly reduces anxiety and stress and improves self-efficacy (Xiao et al. 2020). A team of specialists that is in charge of identifying the signs of stress and anxiety in healthcare professionals should be formed [24]. Experts suggest that when health care professionals have the time to rest during patient care, psychological support should be provided for them (Huh 2020). Mental health experts need to focus on health workers and victim's fears related to COVID-19 (Yasin 2020).

CONCLUSIONS

The result of the study reported that healthcare professionals experienced a significant level of stress during the COVID-19 outbreak. This study also explored different personal coping strategies that the healthcare staff used during the outbreak. It gives insight to the healthcare institutions regarding early measures to be taken for any possible future infectious outbreaks event. The organization may consider the suggested personalized strategies in creating an effective approach

to reduce stress recurrence. Psychological support and care is an essential component of reducing staff stress and distress. Effective strategies and programs to strengthen staff wellbeing during outbreaks that focuses on the value of mental and emotional support are needed. Spiritual support through the enhancement of social well-being might help staff overcome perturbation caused by outbreaks. Understanding this concept is important for every healthcare organizations and medical institution to offer more robust, holistic staff care.

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Ethics approval and consent to participate

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Conflict of interest: None to declare.

Contribution of individual authors:

All authors certify that they have contributed sufficiently in the work to take responsibility for the content, including participation in the concept, design, analysis, writing, or revision of the manuscript.

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