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The Psychological Impact of Coronavirus Disease 2019 on Nurses in Saudi Arabia and Their Coping Strategies

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Abstract

Aims and Objectives: To explore the psychological impact of coronavirus disease 2019 on frontline nurses working in Jazan, Saudi Arabia, and their coping strategies.

Background: As the coronavirus disease 2019 pandemic continues to expand globally, healthcare systems have become more overwhelmed than ever before, placing a great psychological strain on frontline nurses.

Design: A cross-sectional, observational, quantitative study.

Methods: In total, 215 frontline nurses working at 12 hospitals across Jazan, Saudi Arabia, were recruited. Data were collected during August 2020 using a modified version of the severe acute respiratory syndrome team questionnaire.

Results: Roughly two-thirds (62.3%) of the participants reported moderate to high levels of nervousness and fear at work. Ethical and moral responsibility has been determined as the main motivator for frontline nurses to practice their profession, with 88% of them expressing a willingness to work even if the situation deteriorated further. However, 87% of the participants were extremely concerned about transmitting the disease to their family members. The most common coping strategy adopted by the nurses appeared to be adherence to strict protective measures (93.5%), followed by the acquisition of more knowledge about the disease (82.3%).

Conclusion: Frontline nurses experience severe psychological stress, which is mainly caused by their fear of contracting the infection or passing it on to their family members. Thus, proper education, adherence to infection control protocols, effective social support system, and access to sufficient personal protective equipment will help nurses enhance their coping abilities.

Keywords

coping strategies, COVID-19, frontline nurses, psychological impact, Saudi Arabia

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Since the beginning of this millennium, several viral epidemics caused by coronaviruses—such as severe acute respiratory syndrome (SARS) in 2002, Middle East respiratory syndrome (MERS) in 2012, and, recently, coronavirus disease 2019 (COVID-19) caused by a novel coronavirus—have struck the world, wreaking havoc all around the globe (Cascella et al., 2020).

COVID-19 has been identified as an infectious disease that primarily affects the respiratory system, causing mild to severe symptoms (World Health Organization [WHO], 2020a). It was first detected in Wuhan city, Hubei Province, China, in December 2019 (Chen et al., 2020). Its high transmissibility has attracted the attention of the whole world (Shereen et al., 2020). On March 2, 2020, the Saudi Ministry of Health has confirmed the first case of the disease in a Saudi national returning from Iran through Bahrain (Arab News, 2020). As a

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result of the ongoing spread of the disease to different countries, stricter precautions were mandated. On March 11, 2020, the WHO has declared COVID-19 a pandemic (WHO, 2020b).

According to epidemiological data, 80% of COVID-19 patients show mild symptoms and usually recover without needing hospitalization; however, due to the highly transmissible nature of COVID-19, its mortality (about 2%) exceeds that of both SARS and MERS combined (Mahase, 2020). The escalating numbers of new COVID-19 cases have not only overwhelmed healthcare systems but have also left them in a state of unprecedented flux, thus causing frontline medical professionals a great deal of psychological distress (Conversano et al., 2020). In a study by Chen et al. (2020), most nurses reported excitability, irritability, unwillingness to rest, and other signs of psychological distress such as excessive and constant worry, insomnia and fatigue. Additionally, several studies have shown that the personal safety of healthcare workers is of immense importance, especially because their biggest source of concern and fear is contracting the disease and spreading it to their family members (Chung & Yeung, 2020; Khalid et al., 2016).

Severe physical and psychological burdens were reported during this pandemic as frontline nurses often experience extensive workload, exhaustion, infection threat, and frustration with the death of critically ill patients (Cai et al., 2020). According to a study examining the psychological stress which critical care nurses experience during COVID-19, 59% of the studied nurses reported decreased appetite; 55%, fatigue; 45%, insomnia; and 2%, suicidal thoughts (Shen et al., 2020).

During the SARS and MERS outbreaks, frontline healthcare workers endured a high level of stress that finally led to posttraumatic stress syndrome (PTSD) (Lee et al., 2018; Tam et al., 2004), with nursing staff exhibiting a higher rate of anxiety compared to physicians (Huang et al., 2020). In addition, Tam et al. (2004) demonstrated a significant relationship between healthcare workers' perception of infection risk and the risk of developing PTSD.

The COVID-19 pandemic has created unprecedented fear in nursing staff because of the high rate of disease transmission, lack of vaccines, and shortage of personal protective equipment (PPE) (Conversano et al., 2020). The literature identified several contributing factors to increased stress among nurses such as handling uncooperative patients, feeling helpless while caring for critically ill patients, lack of available ward beds, and wearing full PPE for several hours, which in turn can make it difficult to breathe, use the toilet, and have food or water (Tsamakis et al., 2020). Meanwhile, administrators are facing the same fears of inadequate PPE and inflexible work schedules (Urooj et al., 2020).

Tsamakis et al. (2020) emphasized that educating healthcare providers and improving their knowledge on how to prevent and deal with the disease, as well as designing and implementing effective treatment protocols throughout the COVID-19 outbreak, would directly enhance staff morale. Furthermore, Koh et al. (2005) proposed various practical measures and interventions that hospital managers could undertake in order to reduce psychological stress among medical professionals like: establishing clear policies and protocols to prevent any possible confusion, implementing effective infection control practices within the organization, and showing acknowledgment and appreciation for the efforts and sacrifices of their staff.

A cross-sectional study conducted in Jeddah, Saudi Arabia, to explore the emotions, stressors, and coping strategies of healthcare workers during the MERS outbreak concluded that healthcare workers were basically driven by a moral and ethical obligation to carry on their jobs, with their fears assuaged by employing stricter protective measures. Besides, the appreciation of healthcare workers' efforts by the hospital management has proved to be fairly helpful in boosting their organizational confidence and alleviating their psychological stress (Khalid et al., 2016).

Although several different aspects of COVID-19 have been examined so far, there is still a paucity of information in terms of the psychological impact of this pandemic on nursing professionals in Saudi Arabia. Hence, this present study aimed to explore the psychological impact of COVID-19 on nurses working in Jazan, Saudi Arabia, and to further examine their coping strategies.

Methods

Design

This was a cross-sectional, observational, quantitative study, to explore both the psychological impact of COVID-19 on nurses and their coping strategies.

Settings

This study was conducted among frontline nursing staff who are directly providing nursing care to suspect or confirmed cases of COVID-19 at 21 different hospitals (including 2 tertiary and 19 general hospitals) across Jazan, Saudi Arabia.

Participants and Sampling

Primary data were collected from frontline nursing staff working in visual triage station which is an area located in front of the entrance of emergency department to detect patients with respiratory symptoms and isolate them at the point of entry, isolation wards, and

designated critical care areas for COVID-19 patients, between August 1, 2020 and August 31, 2020 at different hospitals across the Jazan region. Online data collection method used as social distancing recommendations. The study questionnaire designed on google forms and link generated was shared on WhatsApp groups to collect information from Frontline nurses. Convenience non-probability sampling was utilized, which help for easy, quick and accessible data collection, and it the most commonly used sampling strategy in healthcare settings (Suhonen et al., 2015), to draw a sample of 215 participants from approximately 437 eligible nurses.

Study Questionnaire

The study tool was a modified version of the SARS questionnaire, which was originally developed by Lee et al. (2005) used during the SARS epidemic and was later adapted by Cai et al. (2020) for COVID-19. The questionnaire included 66 items divided into 5 different sections as follows: section (1), consisting of 8 items about the demographic characteristics of participants (i.e., gender, age, nationality, marital status, level of education, department, and if the participant currently lives with kids or an elderly family member); section (2), including 14 items to record the feelings of participants during the outbreak based on a 4-point scale (i.e., 0 = not at all; 1 = slightly; 2 = moderately; and 3 = very much); section (3), containing 19 items about potential factors that could cause stress; section (4), embracing 14 items about factors that could help in reducing stress, with the possible responses of never, sometimes, often, and always; and section (5), consisting of 11 items to identify coping strategies adopted by participants to reduce their COVID-19-associated stress, with answers ranging from "not important" to "most important." The internal consistency of the questionnaire was previously tested by Khalid et al. (2016), with the values of Cronbach's alpha ranging from 0.78 to 0.86 for various sections of the questionnaire.

Statistical Analysis

Statistical analyses were performed using SPSS ver. 25.0 (IBM, Chicago, IL, USA). Descriptive statistics, including mean, standard deviation (SD), and median, were used to analyze the data collected from the questionnaires. A correlational analysis was used to evaluate internal consistency of the study tool.

Ethical Considerations

Prior to data collection, permission to use questionnaire was granted by the original authors, and Institutional Review Board approval was secured from the Directorate for Health Affairs of Jazan. The survey begun with informed consent, all participants needed to read and chose agree option to start filling the questionnaire. The data collection method did not pose any health risk, and the participants' privacy was carefully preserved. Ultimately, to further enhance anonymity, the participants and their responses were coded so that their data could not be readily used for non-research purposes.

Results

Participants' Characteristics

As shown in Table 1, a total of 215 frontline nurses completed the questionnaire, most of whom were female (75.3%), married (65.6%), natives of Saudi Arabia (82.7%), and 26–30 years of age (36.6%). Over two-thirds of respondents were living with an elderly family member or children; 50%, had a diploma; 41.9%, held a bachelor's degree; and 60%, worked in isolation wards.

Validity and reliability were tested for each section of the study questionnaire by using the Cronbach's alpha test. Tables 2 to 5 have summarized the reliability of

Table 1 Participants' Characteristics.

Factor	Frequency	Percent
Gender		
Male	53	24.7
Female	162	75.3
Nationality		
Saudi	178	82.8
Non-Saudi	37	17.2
Marital status		
Single	74	34.4
Married	141	65.6
Age		
20–25	24	11.2
26–30	78	36.3
31–35	65	30.2
36–40	34	15.8
41–45	14	6.5
Education level		
Diploma	103	47.9
Bachelor	90	41.9
Master	22	10.2
Department/unit		
Isolation wards	128	59.5
Intensive care unit	39	18.1
Emergency room	37	17.2
Visual triage	11	5.1
Do you live with an elderly family member		
No	67	31.2
Yes	148	68.8
Do you live with children		
No	59	27.4
Yes	156	72.6

Table 2. Descriptive Analysis of Frontline Nurses' Feelings During COVID-19.

Item	Very much	Moderate	Slight	Not at all	Mean	SD	*r*
1. You think that your current frontline job comes from your social and moral responsibility.	N = 181 84.2%	N = 29 13.5%	N = 2 0.9%	N = 3 1.4%	2.80	0.51	0.12**
2. You have felt nervous or afraid in the ward.	N = 49 22.8%	N = 85 39.5%	N = 41 19.1%	N = 40 18.6%	1.67	1.03	0.46**
3. You were unhappy about working overtime during the outbreak.	N = 26 12.1%	N = 51 23.7%	N = 51 23.7%	N = 87 40.5%	1.07	1.06	0.67**
4. You expect recognition of your work from the hospital authorities.	N = 55 25.6%	N = 50 23.3%	N = 31 14.4%	N = 79 36.7%	1.38	1.22	0.23**
5. You expect to receive bonus compensation during or after the outbreak.	N = 47 21.9%	N = 41 19.1%	N = 48 22.3%	N = 79 36.7%	1.26	1.17	0.30**
6. You try to reduce exposure to patients diagnosed with COVID-19.	N = 114 53%	N = 34 15.8%	N = 18 8.4%	N = 49 22.8%	1.99	1.24	0.56**
7. You want to stop your present job.	N = 6 2.8%	N = 14 6.5%	N = 17 7.9%	N = 178 82.8%	0.29	0.71	0.55**
8. You think HCWs who have not been exposed to COVID-19 should reduce their contact with you.	N = 96 44.7%	N = 50 23.3%	N = 32 14.9%	N = 37 17.2%	1.95	1.13	0.32**
9. You want to be able to work in a unit where you do not have to deal with patients with COVID-19.	N = 43 20%	N = 43 20%	26 12.1%	103 47.9%	1.12	1.21	0.58**
10. You notice that other HCWs outside your department are avoiding contact with infected patients.	N = 105 48.8%	N = 58 27%	23 10.7%	29 13.5%	2.11	1.06	0.44**
11. If the epidemic suddenly gets worse, you will have to stop your job.	N = 4 1.9%	N = 12 5.6%	N = 9 4.2%	N = 190 88.4%	0.21	0.62	0.56**
12. You feel angry because your workload is greater and more angry than other nurses who have not been exposed to COVID-19.	26 12.1%	N = 42 19.5%	N = 49 22.8%	N = 98 45.6%	0.98	1.07	0.55**
13. You want to call in sick.	N = 4 1.9%	N = 16 7.4%	N = 15 7%	N = 180 83.7%	0.27	0.68	0.51**
14. You have been off work at least once.	N = 11 5.1%	N = 26 12.1%	N = 28 13%	N = 150 69.8%	0.53	0.90	0.34**
Overall mean (SD)					1.25	0.47	
Cronbach's alpha (α)					0.68		

**Statistical significance at the 0.05 level.

each item and its correlation with the total scale score. The value of Cronbach's alpha was found to be 0.68 for the section about frontline nurses' feelings during the COVID-19 pandemic, 0.90 for the section about stressful factors, 0.76 for the section about stress relievers, and 0.73 for the section about personal coping strategies.

Frontline Nurses' Feelings During COVID-19

As shown in Table 2, the participants displayed a great sense of social and moral obligation toward their patients and community in general (mean = 2.80). Furthermore, 88% of frontline nurses were determined to still perform their professional responsibilities even if the pandemic get worse. A high level of stress was observed in the respondents, with 62.3% of them reporting nervousness and fear while working in designated wards for COVID-19 patients.

Factors That Caused Stress Among Frontline Nurses During COVID-19

As shown in Table 3, majority of the nurses (87%) were extremely worried about transmitting the disease to their

Table 3. Descriptive Analysis of Stressful Factors Among Frontline Nurses During COVID-19.

Item	Very much	Moderate	Slight	Not at all	Mean	SD	*r*
Seeing colleagues who were infected	82 38.1%	55 25.6%	42 19.5%	36 16.7%	1.85	1.11	0.75**
You are worried about infecting your family	187 87%	18 8.4%	1 0.5%	9 4.2%	2.78	0.66	0.32**
Small mistakes or inattentions can make you or others infected	157 73%	42 19.5%	14 6.5%	2 0.9%	2.65	0.65	0.42**
Take care of your infected colleagues	72 33.5%	71 33%	22 10.2%	50 23.3%	1.77	1.15	0.52**
Seeing your infected patient die in front of you	135 62.8%	45 20.9%	10 4.7%	25 11.6%	2.35	1.01	0.44**
You do not know when the outbreak will be contained	137 63.7%	45 20.9%	14 6.5%	19 8.8%	2.40	0.95	0.55**
When suspected cases ask for your help frequently	56 26%	51 23.7%	38 17.7%	70 32.6%	1.43	1.19	0.60**
Lack of specific treatment for COVID-19	131 60.9%	39 18.1%	19 8.8%	26 12.1%	2.28	1.05	0.69**
News and social media report the number of new cases every day	97 45.1%	55 25.6%	39 18.1%	24 11.2%	2.05	1.04	0.65**
You feel exhausted	95 44.2%	55 25.6%	34 15.8%	31 14.4%	2.00	1.09	0.63**
When you see your colleagues showing symptoms of infection	109 50.7%	47 21.9%	30 14%	29 13.5%	2.10	1.09	0.61**
When you have some respiratory symptoms, you worry whether you will be infected	129 60%	48 22.3%	22 10.2%	16 7.4%	2.35	0.94	0.66**
You were infected by an infected patient while working at the hospital	107 49.8%	46 21.4%	21 9.8%	41 19.1%	2.02	1.17	0.73**
You often feel weak and torn between your own responsibility and your life's safety	59 27.4%	58 27%	40 18.6%	58 27%	1.55	1.16	0.66**
Seeing stress or fear from your colleagues	79 36.7%	61 28.4%	43 20%	32 14.9%	1.87	1.07	0.71**
You constantly screen yourself for infection	62 28.8%	58 27%	38 17.7%	57 26.5%	1.58	1.16	0.68**
Wearing protective clothing for many hours every day	60 27.9%	62 28.8%	42 19.5%	51 23.7%	1.61	1.13	0.59**
You think the current protection measures are still lacking	80 37.2%	62 28.8%	48 22.3%	25 11.6%	1.92	1.03	0.40**
Often faced with a lack of medical staff, medical equipment, medical resources, etc.	95 44.2%	54 25.1%	37 17.2%	29 13.5%	2.00	1.08	0.43**
Overall mean (SD)					2.03	0.62	
Cronbach's alpha (α)					0.90		

**Statistical significance at the 0.05 level.

family members. 73% of the participants considered it stressful, knowing that small and unintentional mistakes during the care could place a high risk on both nurses and patients. Meanwhile, 62.8% of the participants underwent a great deal of stress while seeing their infected patients die in front of them.

Factors That Helped in Reducing the Stress Among Frontline Nurses During COVID-19

As presented in Table 4, the most effective factor contributing to stress reduction among nurses during the COVID-19 pandemic was knowing that none of their

Table 4. Descriptive Analysis of Stress Relievers Among Frontline Nurses During COVID-19.

Item	Very much	Moderate	Slight	Not at all	Mean	SD	*R*
Positive attitude from your colleagues	130	58	19	8	2.44	0.81	0.54**
	60.5%	27%	8.8%	3.7%			
After effective protection measures have been taken, none of your colleagues have been infected with the virus	94	59	31	31	2.00	1.08	0.52**
	43.7%	27.4%	14.4%	14.4%			
Your patient is getting better	158	41	12	4	2.64	0.67	0.46**
	73.5%	19.1%	5.6%	1.9%			
Your infected colleague is getting better	167	25	15	8	2.63	0.77	0.45**
	77.7%	11.6%	7%	3.7%			
Your hospital provides you with effective safeguards	156	36	16	7	2.59	0.77	0.46**
	72.6%	16.7%	7.4%	3.3%			
Hospital's correct guidance for infection prevention	139	44	18	14	2.43	0.90	0.39**
	64.7%	20.5%	8.4%	6.5%			
None of your family members are infected and they are in a relatively safe state	170	31	7	7	2.69	0.69	0.36**
	79.1%	14.4%	3.3%	3.3%			
Decrease in reported cases	123	55	20	17	2.32	0.94	0.61**
	57.2%	25.6%	9.3%	7.9%			
You receive financial compensation when you work in the field	81	18	39	77	1.48	1.31	0.54**
	37.7%	8.4%	18.1%	35.8%			
Your familiar friends, colleagues, and leaders work with you in the field	154	31	13	17	2.50	0.92	0.62**
	71.6%	14.4%	6%	7.9%			
Once you get infected, your trust in the hospital will give you peace of mind	115	50	22	28	2.17	1.06	0.46**
	53.5%	23.3%	10.2%	13%			
Joking and chatting with your colleagues	147	47	13	8	2.55	0.77	0.53**
	68.4%	21.9%	6%	3.7%			
No overtime (no need to work extra hours)	118	53	24	20	2.25	0.99	0.46**
	54.9%	24.7%	11.2%	9.3%			
Receiving free food and drinks prepared by the hospital for frontline staff	84	36	22	73	1.61	1.31	0.48**
	39.1%	16.7%	10.2%	34%			
Overall mean (SD)						2.31	0.46
Cronbach's alpha (α)						0.76	

**Statistical significance at the 0.05 level.

family members had the disease (79.1%), followed by seeing their patients get better (73.5%). On the other hand, receiving financial compensation (37.7%) and access to free food and drinks while on duty (39.1%) turned out to be the least influential stress relievers.

Personal Coping Strategies Adopted by Frontline Nurses to Alleviate Stress During COVID-19

As described in Table 5, majority of the participants practiced strict protective measures so as to cope with the pandemic (93.5%). Moreover, gaining more knowledge about the disease (e.g., its prevention and transmission) was found to be the second most common coping strategy pursued (82.3%).

Discussion

During contagious respiratory outbreaks, all healthcare professionals are at risk for infection. However, due to the nature of their work, some personnel run a greater risk of contracting the disease than others. Nursing staff, who constitute the largest proportion of any healthcare organization (WHO, 2017), are responsible for providing direct care to patients and are therefore among those at highest risk for infection. This study primarily focused on nurses working in high-risk areas of hospitals—such as isolation wards, emergency departments (EDs), intensive care units (ICUs), and visual triage units—who were required to provide direct nursing care to confirmed and suspected COVID-19 patients. Previous studies during the SARS, MERS, and Ebola outbreaks have demonstrated that frontline healthcare professionals are heavily

Table 5. Descriptive Analysis of Coping Strategies Adopted by Frontline Nurses During COVID-19.

Item	Very important	Important	Slightly important	Not at all important	Mean	SD	*r*
Following strict protective measures, such as handwashing, masks, face masks, protective clothing, etc.	201 93.5%	14 6.5%	0 0	0 0	2.93	0.25	0.30**
Every fever patient may be infected with COVID-19, even if the nucleic acid test (PCR) is negative	69 32.1%	72 33.5%	66 30.7%	8 3.7%	1.94	0.88	0.52**
Learning about COVID-19, its prevention, and mechanism of transmission	177 82.3%	34 15.8%	4 1.9%	0 0	2.80	0.44	0.34**
Choosing a more single approach (loner) of travel, such as self-driving, and avoid transportation such as buses	160 74.4%	47 21.9%	3 1.4%	5 2.3%	2.68	0.62	0.37**
Enjoying leisure activities in your free time, such as watching movies, reading, etc.	113 52.6%	73 34%	27 12.6%	2 0.9%	2.38	0.74	0.56**
Chatting with family and friends to relieve stress and obtain support	161 74.9%	49 22.8%	5 2.3%	0 0	2.73	0.50	0.52**
Talking to yourself and motivating to face the COVID-19 outbreak with positive attitude	170 79.1%	40 18.6%	5 2.3%	0 0	2.77	0.48	0.34**
Seeking help from a psychologist	45 20.9%	57 26.5%	51 23.7%	62 28.8%	1.40	1.11	0.73**
Avoiding working overtime to reduce exposure to COVID-19 patients in hospital	90 41.9%	59 27.4%	33 15.3%	33 15.3%	1.96	1.09	0.67**
Avoid media news about COVID-19 and related fatalities	49 22.8%	72 33.5%	63 29.3%	31 14.4%	1.65	0.99	0.58**
Ventilated emotions by crying, screaming, etc.	49 22.8%	50 23.3%	39 18.1%	77 35.8%	1.33	1.18	0.68**
Overall mean (SD)					2.23	0.42	
Cronbach's alpha (α)					0.73		

**Statistical significance at the 0.05 level.

impacted by the stress caused by such epidemics (Khalid et al., 2016; Koh et al., 2005; Marco et al., 2015), with most of them being likely to suffer psychologically long after the initial outbreak. The unique characteristics of the current COVID-19 pandemic, such as high transmissibility, high mortality, lack of effective treatment options, inadequate and slow process of vaccination, and uncertainty about the disease course, have also added to the stress of frontline professionals (Na et al., 2020).

The current study revealed that frontline nurses in the Jazan region came under enormous psychological strain as a result of the COVID-19 pandemic, with most of them expressing feelings of nervousness and fear. This finding has been consistent with previous studies conducted during various epidemics (Cai et al., 2020; Nie et al., 2020). Nie et al. (2020) reported that the majority of nurses on the front line against COVID-19 were avoided by their family members, friends, and colleagues; thus, they had to deal not only with the pandemic but also with its associated social stigma. Therefore, social support has been considered an important factor that alleviates psychological stress among nurses in crises (Gu et al., 2016). As frontline nurses suffer from a lack of emotional and social support, the role of workplace became more important as resource for social support (Nie et al., 2020). Social support gained from colleagues, managers and healthcare settings is considered to be important for nurses to cope and deal effectively with different stressors in the workplace (Fu et al., 2018; Labrague & De los Santos, 2020). The most prominent result in the current study was the frontline nurses' strong sense of social and moral responsibility toward their patients and community in general. Additionally, 88% of the participants felt morally and ethically obligated to provide nursing care to COVID-19 patients, regardless of potential dangers to their own health. This is in agreement with the fact that professional values are foundational to professional nursing practice (Schmidt & McArthur, 2018). The altruistic values

of the nursing profession became evident once again as the majority of frontline nurses in this study disregarded financial compensation as a motivator, thus proving they were less materially driven.

The questionnaire utilized in this study covered both direct and indirect causes of increased stress among frontline nurses. Virtually, all participants shared the common fear of transmitting the infection to their family members and loved ones. This result was expected because 66% of the participants reported that they were living with their children or an elderly family member. Family safety has also been identified by other studies as a major concern of frontline workers during various epidemics (Khalid et al., 2016; Tsamakis et al., 2020). The stress among the participants was found to also originate from witnessing the deterioration of their patients' clinical status or even their death despite all medical efforts. In fact, several studies indicated that the sense of defeat against the pandemic was highly stressful as it leads nurses to feel guilty and blame themselves (Shen et al., 2020; Tsamakis et al., 2020).

Knowing that family's health and physical safety is secured accounted as the most important factor that reduced participants' stress, which is in line with the findings of earlier studies (Cai et al., 2020; Khalid et al., 2016). Patients' recovery from the disease and their response to the provided care turned out to be another significant stress reliever for frontline nurses, probably because this gave them both a sense of usefulness and hope that this unprecedented disease could finally be controlled. Hospitals, too, were found to occupy a substantial role in reducing staff stress by means of establishing effective and scientific protocols for pandemic management as well as providing sufficient PPE. Nie et al. (2020) revealed that frontline nurses were less likely to develop psychological distress if PPE availability was guaranteed; on the other hand, factors like financial rewards or free access to food and drinks did not appear to have a significant effect on the psychological strain of frontline nurses.

In this study, frontline nurses used different personal coping strategies to ease their stress during the COVID-19 pandemic, with adherence to strict protective measures being the most frequent (93.5%). In addition, gaining more knowledge about the nature, prevention, and transmission of COVID-19 was another important strategy that helped frontline nurses to cope. Previous studies have also shown that training by hospitals and related organizations plays a vital role in the prevention of infectious diseases (Anuradha & Dandekar, 2014; Paudyal et al., 2008). Taking this into consideration, the Saudi Ministry of Health has established various COVID-19 training programs for all healthcare specialties.

This current study had several limitations. To begin with, the study sample size was relatively small, which limits the generalizability of our findings. This study was further limited by its cross-sectional design. That is to say, data was collected during August 2020, but the psychological impact of COVID-19 accumulates over time and is subject to constant change. Finally, the study questionnaire was completed by only frontline nurses working in high-risk areas of hospital (e.g., isolation wards, EDs, ICUs, and visual triage units), while the psychological stress caused by this pandemic seems to have variably affected almost all healthcare professionals in all specialties.

Conclusion

This study indicated that nurses working on the front line against COVID-19 in Jazan, Saudi Arabia, experienced intense psychological stress, which is primarily attributed to fear of contacting the infection or passing it on to their close relatives. Meanwhile, they abode by a moral code that motivated them to fulfill their duty even at the cost of their own health.

Hospital management can lessen the psychological burden of the COVID-19 pandemic on nurses and help them to cope better by providing proper education and training, establishing effective social support systems, and ensuring the availability of necessary equipment and supplies for fighting against this disease.

Declaration of Conflicting Interests

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References

Anuradha, M., & Dandekar, R. H. (2014). Knowledge, attitude and practice among food handlers on food borne diseases: A hospital based study in tertiary care hospital. *International Journal of Biomedical and Advance Research*, *5*(4), 196. https://doi.org/10.7439/ijbar.v5i4.706

Arab News. (2020). *Saudi Arabia announces first case of coronavirus*. https://www.arabnews.com/node/1635781/saudi-arabia

Cai, H., Tu, B., Ma, J., Chen, L., Fu, L., Jiang, Y., & Zhuang, Q. (2020). Psychological impact and coping strategies of frontline medical staff in Hunan between January and

March 2020 during the outbreak of coronavirus disease 2019 (COVID-19) in Hubei, China. *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research*, *26*, e924171. https://doi.org/10.12659/msm.924171

Cascella, M., Rajnik, M., Cuomo, A., Dulebohn, S. C., & Di Napoli, R. (2020). *Features, evaluation and treatment coronavirus (COVID-19)*. *Statpearls* [Internet]. StatPearls Publishing.

Chen, Q., Liang, M., Li, Y., Guo, J., Fei, D., Wang, L., He, L., Sheng, C., Cai, Y., Li, X., Wang, J., & Zhang, Z. (2020). Mental health care for medical staff in China during the COVID-19 outbreak. *The Lancet*. *Psychiatry*, *7*(4), e15–e16. https://doi.org/10.1016/s2215-0366(20)30078-x

Chung, J. P., & Yeung, W. S. (2020). Staff mental health self-assessment during the COVID-19 outbreak. *East Asian Archives of Psychiatry: Official Journal of the Hong Kong College of Psychiatrists = Dong Ya Jing Shen ke Xue Zhi : Xianggang Jing Shen ke yi Xue Yuan qi Kan*, *30*(1), 34. https://doi.org/10.12809/eaap2014

Conversano, C., Marchi, L., & Miniati, M. (2020). Psychological distress among healthcare professionals involved in the covid-19 emergency: Vulnerability and resilience factors. *Clinical Neuropsychiatry*, *17*(2), 94–96. http://10.36131/CN20200212

Fu, C. Y., Yang, M. S., Leung, W., Liu, Y. Y., Huang, H. W., & Wang, R. H. (2018). Associations of professional quality of life and social support with health in clinical nurses. *Journal of Nursing Management*, *26*(2), 172–179.

Gu, Y., Hu, J., Hu, Y., & Wang, J. (2016). Social supports and mental health: A cross-sectional study on the correlation of self-consistency and congruence in China. *BMC Health Services Research*, *16*, 207. https://doi-org.sdl.idm.oclc.org/10.1186/s12913-016-1463-x

Huang, J. Z., Han, M. F., Luo, T. D., Ren, A. K., & Zhou, X. P. (2020). Mental health survey of 230 medical staff in a tertiary infectious disease hospital for COVID-19. *Chinese Journal of Industrial Hygiene and Occupational Diseases*, *38*, 192–195. http://10.3760/cma.j.cn121094-20200219-00063

Khalid, I., Khalid, T. J., Qabajah, M. R., Barnard, A. G., & Qushmaq, I. A. (2016). Healthcare workers emotions, perceived stressors and coping strategies during a MERS-CoV outbreak. *Clinical Medicine & Research*, *14*(1), 7–14. https://doi.org/10.3121/cmr.2016.1303

Koh, D., Lim, M. K., Chia, S. E., Ko, S. M., Qian, F., Ng, V., Tan, B. H., Wong, K. S., Chew, W. M., Tang, H. K., Ng, W., Muttakin, Z., Emmanuel, S., Fong, N. P., Koh, G., Kwa, C. T., Tan, K. B.-C., & Fones, C. (2005). Risk perception and impact of severe acute respiratory syndrome (SARS) on work and personal lives of healthcare workers in Singapore what can we learn. *Medical Care*, *43*(7), 676–682. https://doi.org/10.1097/01.mlr.0000167181.36730.cc

Labrague, L. J., & De los Santos, J. A. A. (2020). COVID-19 anxiety among front-line nurses: Predictive role of organisational support, personal resilience and social support. *Journal of Nursing Management*, *28*(7), 1653–1661. https://doi-/10.1111/jonm.13121

Lee, S.-H., Juang, Y.-Y., Su, Y.-J., Lee, H.-L., Lin, Y.-H., & Chao, C.-C. (2005). Facing SARS: Psychological impacts on SARS team nurses and psychiatric services in a Taiwan general hospital. *General Hospital Psychiatry*, *27*(5), 352–358. https://doi.org/10.1016/j.genhosppsych.2005.04.007

Lee, S. M., Kang, W. S., Cho, A. R., Kim, T., & Park, J. K. (2018). Psychological impact of the 2015 MERS outbreak on hospital workers and quarantined hemodialysis patients. *Comprehensive Psychiatry, 87*, 123–127.

Mahase, E. (2020). Coronavirus covid-19 has killed more people than SARS and MERS combined, despite lower case fatality rate. *BMJ (Clinical Research Ed.)*, *368*, m641. https://doi.org/10.1136/bmj.m641

Marco, L., Christian, A. B., Bernd, L., Marylyn, M. A., Stefan, S., Ansgar, W. L., & Christoph, S. (2015). Ebola and psychological stress of health care professionals. *Emerging Infectious Diseases*, *21*(5), 913–914. https://doi.org/10.3201/eid2105.141988

Na, Z., Dingyu, Z., Wenling, W., Xingwang, L., Bo, Y., Jingdong, S., Xiang, Z., Baoying, H., Weifeng, S., Roujian, L., Peihua, N., Faxian, Z., Xuejun, M., Dayan, W., Wenbo, X., Guizhen, W., Gao, G. F., Wenjie, T., & China Novel Coronavirus Investigating and Research Team. (2020). A novel coronavirus from patients with pneumonia in China, 2019. *The New England Journal of Medicine*, *382*(8), 727–733. https://doi.org/10.1056/nejmoa2001017

Nie, A., Su, X., Zhang, S., Guan, W., & Li, J. (2020). Psychological impact of COVID-19 outbreak on frontline nurses: A cross-sectional survey study. *Journal of Clinical Nursing*, *29*(21–22), 4217–4226. https://doi.org/10.1111/jocn.15454

Paudyal, P., Simkhada, P., & Bruce, J. (2008). Infection control knowledge, attitude, and practice among Nepalese health care workers. *American Journal of Infection Control*, *36*(8), 595–597. doi.org/10.1016/j.ajic.2007.10.026

Schmidt, B. J., & McArthur, E. C. (2018). Professional nursing values: A concept analysis. *Nursing Forum*, *53*(1), 69–75. https://doi.org/10.1111/nuf.12211

Shen, X., Zou, X., Zhong, X., Yan, J., & Li, L. (2020). Psychological stress of ICU nurses in the time of COVID-19. *Critical Care (London, England)*, *24*(1), 200. https://doi.org/10.1186/s13054-020-02926-2

Shereen, M. A., Khan, S., Kazmi, A., Bashir, N., & Siddique, R. (2020). COVID-19 infection: Origin, transmission, and characteristics of human coronaviruses. *Journal of Advanced Research, 24*, 91–98.

Suhonen, R., Stolt, M., Katajisto, J., & Leino, K. H. (2015). Review of sampling, sample and data collection procedures in nursing research—An example of research on ethical climate as perceived by nurses. *Scandinavian Journal of Caring Sciences*, *29*(4), 843–858. https://doi.org/10.1111/scs.12194

Tam, C. W., Pang, E. F., Lam, L. C., & Chiu, H. F. (2004). Severe acute respiratory syndrome (SARS) in Hong Kong in 2003: Stress and psychological impact among frontline healthcare workers. *Psychological Medicine*, *34*(7), 1197–1204. https://doi.org/10.1017/S0033291704002247

Tsamakis, K., Rizos, E., Manolis, A. J., Chaidou, S., Kympouropoulos, S., Spartalis, E., Spandidos, D. A., Tsiptsios, D., & Triantafyllis, A. S. (2020). COVID-19 pandemic and its impact on mental health of healthcare professionals. *Experimental and Therapeutic Medicine*, *19*(6), 3451–3453. https://doi.org/10.3892/etm.2020.8646

Urooj, U., Ansari, A., Siraj, A., Khan, S., & Tariq, H. (2020). Expectations, fears and perceptions of doctors during covid-19 pandemic. *Pakistan Journal of Medical Sciences*, *36*(COVID19-S4), S37. https://doi.org/10.12669/pjms.36.covid19-s4.2643

World Health Organization. (2017). Report of the policy dialogue meeting on the nursing workforce. In WHO. Dialogue Meeting, Geneva, Switzerland (pp. 6–7).

World Health Organization. (2020a). *Coronavirus*. https://www.who.int/health-topics/coronavirus#tab=tab_1

World Health Organization. (2020b). *Announces COVID-19 outbreak a pandemic*. http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/news/news/2020/3/who-announces-covid-19-outbreak-a-pandemic