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Nurses' perceived demands and burnout level in the critical care units during the COVID-19 pandemic crisis

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ABSTRACT

Background & Aim: The coronavirus disease (COVID-19) pandemic challenged the physical and psychological well-being of critical care nurses because of the increasing number of infected patients, demands of care, and shortage of healthcare front-liners, particularly nurses. This study determined nurses' perceived demands and the significant predictors of their burnout level in critical care units of tertiary hospitals in Saudi Arabia during the COVID-19 pandemic crisis.
Methods & Materials: This study used a cross-sectional research design. It was conducted from November to December 2021. Two hundred seventy nurses working in critical care units of tertiary hospitals in Saudi Arabia were surveyed using adopted questionnaires.
Results: The findings of this study revealed that the nurses' demands concerning safety, communication, and relationships between team members, and psycho-socio-emotional aspects were moderate, whereas their demands concerning organization and decision-making were slight. Furthermore, nurses' levels of emotional exhaustion and depersonalization/ loss of empathy were high, and personal accomplishment was low, which indicates a high level of occupational burnout. Interestingly, the correlations between the dimensions of burnout and perceived demands were highly significant ($p<0.001$).
Conclusion: The safety demands of critical care nurses significantly predicted emotional exhaustion due to an increased workload during COVID-19. The demands were significant predictors of depersonalization and personal accomplishment due to their perception that staff shortage, imbalanced workload, increasing care demand, and fatigue might have compromised the quality of patient care. Nurses experienced increased emotional distress and frustration in conveying their feelings of exhaustion, which led to high burnout levels during COVID-19.

Introduction

The coronavirus disease (COVID-19) crisis placed enormous stress and pressure on healthcare services and nursing staff (1). Critical care nurses were directly involved in the care of severely ill patients infected with the virus (2). The demand for nurses increased exponentially during the pandemic crisis, but it also highlighted their strength and resilience (3). Additionally, critical care nurses had to manage the risk of infection on their own due to the lack of protective measures and tools during the outbreak; they provided regular care while wearing personal protective equipment. Furthermore, witnessing patients who died alone because of strict isolation measures inside hospitals affected their psychological well-being. Therefore, the need for emergency services grew considerably as the demand for critical care increased (4).

Nurses played multiple roles during the COVID-19 pandemic, including observing and treating suspected cases, triaging them, and administering appropriate treatment to confirmed cases. Consequently, nurses experienced heightened stress and pressure at the frontline of the pandemic (5). Furthermore, Mekonen et al. reported that nurses experienced considerable grief and fear due to various factors such as the sudden surge in the number of infected cases and increased mortality rates not only in Saudi Arabia but worldwide. Nurses during the COVID-19 pandemic experienced

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exhaustion physically, mentally, and emotionally (6). In a systematic review and meta-analysis conducted by Quesada-Puga et al., nurses in the intensive care unit still show job dissatisfaction and a high level of burnout due to the working conditions and environment (7). Additionally, according to Lima et al., nurses who worked in the intensive care unit presented high level of burnout (8).

The nature and demands of their work made them confront the critical events caused by the pandemic and the accompanying unfavourable situations. Consequently, nurses were at a higher risk of psychological pressure (9). Additionally, these challenges may have impacted their quality of care for the patients (10). Therefore, understanding and evaluating the effects of the COVID-19 crisis on nurses is critical for protecting their well-being and strengthening their emotional resilience, which directly impacts the quality of healthcare services. However, there is a paucity of epidemiological research on nurses' physical and psychological health and its associated factors (5). Critical care nurses provided necessary patient care despite the enormous stress and pressure caused by the pandemic. Furthermore, several studies have been conducted on burnout syndrome among nurses during the pandemic crisis (11). However, studies on the experience of burnout syndrome by nurses in critical care units are scarce (12).

Strategies were required to protect healthcare staff from severe stress, both physical and psychological (13). However, healthcare workers who continued to experience work-related stress due to the continuous and prolonged exposure to the COVID-19 emergency response developed burnout syndrome (14). Burnout syndrome is characterised by emotional exhaustion (EE), depersonalisation (DP), and reduced personal accomplishment (PA) among employees due to work stress (15). Most of the studies conducted during the COVID-19 crisis reported that many healthcare workers developed psychological problems such as anxiety, nervous breakdown, irritability, sleep disorders, and muscle tensions since the pandemic began (16). Furthermore, the COVID-19 pandemic crisis was ended, and declared that it is no longer a public health emergency of international concern by the World Health Organization (WHO) on May 5, 2023, and a strategic plan regarding the long-term management of COVID-19 was also released. The strategic plan focuses on five essential areas, such as emergency management, collaborative surveillance, protection of the community, safety measures, accessible care, and access to countermeasures (17).

The nurses who participated in this study brought out that they experienced many challenges and difficulties during COVID-19 such as fatigue, sleeplessness, anxiety, stress, exhaustion from work, and loneliness due to isolation and quarantine if they were suspected due to the possible signs and symptoms, and fear of contracting with the deadly virus that might transfer with their love ones. These were the effects of an increasing demand for care, not only for COVID-19 patients but also with non-COVID patients. Therefore, this study aimed to determine nurses' perceived demands and the significant predictors of their burnout level in critical care units of tertiary hospitals in Saudi Arabia during the COVID-19 pandemic crisis.

Methods

Design

This study employed a cross-sectional research design.

Setting

This study was conducted in critical care units of three tertiary hospitals in Saudi Arabia, including emergency rooms, intensive care units, and coronary care units. The emergency rooms and intensive care units of the hospitals have a bed capacity ranging from 25 to 35, and the coronary care units have a bed capacity ranging from 20 – 30. The emergency department is a complex environment with a high workload, time-sensitive, extremely stressful, mostly dealing with life-threatening conditions, and frequently faces the problems of overcrowding. The intensive care unit and coronary care unit are the most high-tech units in the hospitals due to the integration of artificial intelligence and smart technologies in patient care, balancing medical

resources, limited specialized trained nurses and staff, and patient complexity.

Sample and sampling technique

A total of 270 nurses were recruited to participate in the study from a total number of 480 eligible nurses based on the set criteria. The sample included 110, 80, and 80 nurses in Hospitals 1, 2, and 3, respectively. The Raosoft sample size online calculator was used to determine the minimum required number of participants. Based on the calculation, 214 was required to be included in the study with a 5% margin of error, 95% confidence level, and 50% response distribution. However, the researcher distributed the questionnaire to 350 eligible participants, and a total of 270 were returned.

Furthermore, convenience non-probability sampling was used to recruit participants from the study population. The inclusion criteria were: 1) have a diploma, bachelor's, or master's degree in nursing; 2) have a license to practice nursing in Saudi Arabia; and 3) have at least three months of working experience in a critical care unit, such as an emergency room, intensive care unit, and coronary care unit. Nurses who did not meet the inclusion criteria were excluded from the study. Any nationality was welcome to participate.

Research instruments

Nurses' demands concerning safety, organisation, decision-making, communication and relationships between team members, and psycho-socio-emotional aspects were assessed using the nurses' perceptions and demands regarding COVID-19 care delivery questionnaire developed by González-Gil et al. (18). The 31-item questionnaire is rated on a four-point Likert scale with the following responses: 1 = 'never', 2= 'sometimes', 3= 'most of the time', and 4= 'always' were used to measure positively worded statements and reverse scoring was used for negatively worded statements across all dimensions. The dimensions were safety (10 items), organisation (6 items), decision-making (4 items), communication and relationships between team members (5 items), and psycho-socio-emotional needs (6 items). The questionnaire adopted from González-Gil et al. was validated by the researcher in a pilot study with 40 nurses (18); however, these participants were not included in the present study. The questionnaire is internally consistent and reliable, with a Cronbach's alpha of 0.82 indicating good reliability. According to Taber, an α value ranging from 0.73–0.95 indicates high reliability (19). Critical care nurses' responses regarding their demands were interpreted using the following range: 1.0 to 1.50 = 'not at all', 1.51 to 2.50 = 'slightly demanded', 2.51 to 3.50= 'moderately demanded', and 3.51 to 4.00= 'highly demanded'.

Furthermore, the Maslach Burnout Inventory (MBI) was used to assess nurses' burnout level. It comprises items on 22 symptoms that span the full spectrum of occupational burnout, which are rated using a seven-point Likert scale: 0= never, 1= at least few times a year, 2= at least once a month, 3= several times a month, 4= once a week, 5= several times a week, and 6 = every day. It includes the following domains: emotional exhaustion (EE) (summation of responses to items 01, 02, 03, 06, 08, 13, 14, 16, and 20), depersonalization (DP)/loss of empathy (summation of responses to items 05, 10, 11, 15, and 22), and personal accomplishment (PA) assessment (summation of responses to items 04, 07, 09, 12, 17, 18, 19, and 21). The reliability coefficients of the EE, DP, and PA subscales for our total sample were 0.91, 0.73, and 0.72, respectively (20). Critical care nurses' burnout level was interpreted using the following ranges. EE was interpreted as 'low', 'moderate', and 'high' when scores were less than 17, 18 to 29, and more than 30, respectively. DP was interpreted as 'low', 'moderate', and 'high' when scores were less than 5, 6 to 11, and more than 12, respectively. PA was 'low', 'moderate', and 'high' when scores were less than 33, 34 to 39, and more than 40, respectively.

Data collection procedure

The institutional review board approved this study. The directors of the selected hospitals and nurse managers of critical care units were approached to obtain permission to collect data from nurses working in their critical care units: emergency room, intensive care unit, or

coronary care unit. The researcher visited the critical care units three to four times and administered the questionnaires to the respondents. The participants completed the questionnaires within 20–30 minutes and were instructed to return it to the researcher. During the data collection period, between November and December 2021, the researchers were available to answer respondents' queries about the questionnaire.

Data analysis

Data were analysed using IBM SPSS Statistics 20. Descriptive and inferential statistical procedures were applied, including frequency and percentage to analyse the demographic characteristics of the respondents, and mean and SD to interpret critical care nurses' demands and burnout level. Furthermore, Pearson's correlation coefficient was used to examine the strength of the direct relationship between perceived demands and burnout level. Additionally, regression analysis was used to determine the significant predictors of respondents' burnout level.

Ethical considerations

The institutional review board reviewed and approved this study (approval number IRB-268 and KSA: H-11-N-081). Informed consent was obtained from each participant before their enrolment in the study. Participants were informed about the study's purpose and informed that their information would be shared only with the research team members. Each participant was given an identification number to keep their responses anonymous and confidential. They were assured that their participation was voluntary and that they could withdraw at any time without any penalty. Moreover, the study was conducted in compliance with the Declaration of Helsinki.

Results

As shown in Table 1, about 270 critical care nurses answered the questionnaire (men, 12.96%; women, 87.04%). Their mean age and working experience were 31–35 years and 4–6 years, respectively. Furthermore, most of the nurses had a bachelor's degree in nursing and were affiliated with Hospital 1. Participants' demographic profile included gender, age, working experience, education, and hospital affiliation (Table 1). Table 2 shows that decision-making and organisation were moderately demanded by critical care nurses. Whereas safety, communication, and relationships between team members, and psycho-socio-emotional factors were slightly demanded (Table 2).

Table 1. Demographic profile of the participants

Demographics	N	%
Gender		
Men	35	12.96
Women	235	87.04
Age		
25–30 years	96	35.56
31–35 years	100	37.04
36–40 years	33	12.22
41–45 years	27	10
46 years and above	14	5.19
Duration of working experience		
Less than 1 year	4	1.48
1–3 years	49	18.15
4–6 years	85	31.48
7–9 years	53	19.63
More than 10 years	79	29.26
Educational qualification		
Diploma in nursing	29	10.74
Bachelor's in nursing	231	85.56
Master's degree	10	3.7
Hospital affiliation		
Hospital 1	110	40.74
Hospital 2	80	29.63
Hospital 3	80	29.63

Table 2. Perceived demands of critical care nurses during the COVID-19 crisis

Perceived Demands Domains	Mean	SD	Interpretation
Safety	2.84	0.37	Moderately demanded
Organisation	2.23	0.58	Slightly demanded
Decision-making	2.53	0.58	Slightly demanded
Communication and relationships between team members	3.16	0.63	Moderately demanded
Psycho-socio-emotional	2.73	0.49	Moderately demanded

SD = standard deviation

Table 3. Perceived occupational burnout level of critical care nurses

Occupational Burnout Domains	Mean	SD	Interpretation
Emotional Exhaustion (EE)	32.46	6.06	High
Depersonalisation (DP)	17.91	3.77	High
Personal Accomplishment (PA)	28.84	4.57	Low

SD = standard deviation

Table 4. Correlation between burnout and perceived demands dimensions

Demands	Pearson's correlation value	P-value	Interpretation
Emotional Exhaustion (EE)			
Safety	0.7991	<0.001	Highly significant
Organisation	0.7357	<0.001	Highly significant
Decision-making	0.7642	<0.001	Highly significant
Communication and relationships between team members	0.7462	<0.001	Highly significant
Psycho-socio-emotional	0.7462	<0.001	Highly significant
Depersonalisation (DP)			
Safety	0.8739	<0.001	Highly significant
Organisation	0.7514	<0.001	Highly significant
Decision-making	0.7723	<0.001	Highly significant
Communication and relationships between team members	0.7723	<0.001	Highly significant
Psycho-socio-emotional	0.7723	<0.001	Highly significant
Personal Accomplishment (PA)			
Safety	0.9797	<0.001	Highly significant
Organisation	0.9895	<0.001	Highly significant
Decision-making	0.9909	<0.001	Highly significant
Communication and relationships between team members	0.9909	<0.001	Highly significant
Psycho-socio-emotional	0.9909	<0.001	Highly significant

Table 3 shows the nurses' perceived occupational burnout level on three domains. The overall score on their level of EE was 32.46 with an SD of 6.06, which is high. The overall score on their DP level was 17.91 with an SD of 3.77, which is high.

The overall score on their PA level was 28.84 with an SD of 4.57, which is low. According to the MBI (Maslach & Jackson, 1981), high scores on the EE and DP dimensions and low scores on the PA dimension indicate a high level of occupational burnout. Therefore, critical care nurses experienced a high level of occupational burnout during the period of this study (Table 3). Table 4 shows that all p-values were much lower than the 0.01 level of significance, indicating highly significant correlations between the dimensions of burnout and perceived demands. The correlation coefficients were above 0.70, implying strong relationships between variables. A positive correlation value indicates a direct relationship. As the perceived demands increased, the burnout level also increased and vice versa (Table 4).

As shown in Table 5, the model was significant in explaining the relationships between perceived needs and emotional exhaustion. The model was significant in explaining the relationships between perceived needs and depersonalisation. Furthermore, the model was significant in explaining the relationships between perceived needs and depersonalisation (Table 5).

Table 5. Regression analysis results for emotional exhaustion (EE), depersonalisation (DP), and personal accomplishment (PA)

Emotional Exhaustion (EE)					
Predictors	**Beta coefficient**	**SE**	**p-value**	**R-square**	**Prob>F**
Safety	7.76415	0.82854	0.00		
Organisation	-1.502705	1.06095	0.16		
Decision-making	-				
Communication and relationships between Team members	-1.336386	0.84065	0.11		
Psycho-socio-emotional	-			0.6678	0.00
Hospital 1	0.1753958	0.51955	0.74		
Hospital 2	-				
Hospital 3	-0.0035111	0.55901	1.00		
Constant	2.457121	1.37707	0.08		
Depersonalisation (DP)					
Predictors	**Beta Coefficient**	**SE**	**p-value**	**R-square**	**Prob>F**
Safety	8.294784	0.23553	0.00		
Organisation	-2.636988	0.3016	0.00		
Decision-making	-				
Communication and relationships between team members	-1.673045	0.23898	0.00		
Psycho-socio-emotional	-			0.9305	0.00
Hospital 1	0.0089907	0.1477	0.95		
Hospital 2	-				
Hospital 3	0.079772	0.15891	0.62		
Constant	-2.447205	0.39147	0.00		
Personal Accomplishment (PA)					
Predictors	**Beta Coefficient**	**SE**	**p-value**	**R-square**	**Prob>F**
Safety	0.8526078	0.11777	0.00		
Organisation	1.318494	0.1508	0.00		
Decision-making	-				
Communication and relationships between team members	0.8365224	0.11949	0.00		
Psycho-socio-emotional	-			0.9882	0.00
Hospital 1	-0.0044954	0.07385	0.95		
Hospital 2	-				
Hospital 3	-0.039886	0.07946	0.62		
Constant	1.223603	0.19573	0.00		

SE = standard error

Discussion

The present study determined the perceived demands and the significant predictors of their burnout level in the critical care units of tertiary hospitals in Saudi Arabia during the COVID-19 pandemic crisis. The findings of this study revealed that safety, communication, and relationships between team members, and psycho-socio-emotional demands were moderately demanded, whereas organisation and decision-making demands were slightly demanded by the nurses. The EE and DP dimensions of burnout showed high scores, while PA had a low score. High scores on the EE and DP dimensions and a low score on the PA dimension revealed a high level of occupational burnout (20). Interestingly, the correlations between the dimensions of burnout and perceived demands were highly significant. Furthermore, safety demand was found to significantly predict EE. Safety, organisation, and communication demands were significant predictors of DP and PA.

González-Gil et al. found that nurses were afraid of the lack of health safety measures and of being asymptomatic carriers, which were the primary sources of virus contamination among their colleagues and families. Factors that elevated their fear included the shortage of personal protective equipment and the lack of precise guidelines for managing infected cases (18). Moreover, nurses worked hard to meet

patients' needs, including those of infected patients, maintain and focus on their mental health, and improve their knowledge and expertise to fight COVID-19. However, the fear of becoming infected and spreading the infection to their family members was still a dilemma (18). Consequently, it was stressful for nurses to maintain their daily routines (21). High workload and adverse effects of the virus induced tremendous pressure and psychological stress among clinical nurses, which significantly affected their work performance (13). The results of the current study regarding the experience of burnout by critical care nurses during COVID-19 is consistent with the study findings of Toscano et al., wherein a high level of burnout symptoms were reported among nurses in the intensive care unit during the COVID-19 crisis due to the fear of infection, increased workload, social stigma, and lack of protective equipment (22). Similarly, Jamebozorgi et al. reported high levels of burnout among nurses during the COVID-19 pandemic (23).

Furthermore, nurses' widespread perception of their inability to attend to the psycho-socio-emotional needs of patients and families, and difficulties in expressing their concerns, can increase their emotional fatigue. Considering the nature of their work, nurses belong to a group of workers who are more likely to experience continuous and intensive stress, tension, lack of sleep, and other psychological stress symptoms, especially the critical care unit front-liners during the COVID-19 pandemic (24). Moreover, experts noted that nurses caring for patients with COVID-19 in critical care facilities and providing medical emergency services were at a higher risk for secondary trauma and compassion fatigue (25).

However, most nurses think that their managers do not validate their concerns and may not accept suggestions, leading to unmet needs. Difficulty in communicating with managers has been linked to the moral aspects of challenges related to non-consensual decisions (26). Jun et al. noted that team collaboration and cohesion during health crises play a vital role in coping and resilience among nurses. Additionally, middle managers executing care plans in care units must consider nurses' experiences to modify their response to the needs of nurses during a health crisis (27).

In an organisation, there is an apparent discrepancy between tasks and human resources. This may be due to the increasing workload of patients infected with COVID-19. Lucchini et al. noted a 33% increase in the workload of critical care nurses because of the increase in patients' care dependency. Additionally, nurses stated that the nature of their work and organisation did not allow them to rest and disconnect from their duties. This contributed to their exhaustion, both physical and emotional, leading to sleep deprivation (28).

Moreover, nurses were under elevated stress and precarious situations because of increased workloads, including the necessity to make self-determining decisions. It was found that communicating with their immediate managers did not help improve their situations, particularly when facing difficulties in meeting patients' needs at the psycho-socio-emotional level (18). However, the reports of Chen et al., which emphasise the value of knowledge collaboration between colleagues in strengthening their commitment to professionalism, are worth considering (29).

Implications for clinical practice

- The provision of adequate knowledge, training, and protective equipment for nurses to overcome the effects of the COVID-19 crisis should be prioritised.
- Efforts should be made to promote work-life balance, create risk assessment and mitigation measures, and provide nurses with mental well-being and social support services.
- Recognising the advanced and multiple roles of nurses in critical care is essential for boosting their clinical competencies.

Limitations

This study had some limitations to consider. First, this study focused on the perceived demands of critical care nurses concerning safety, organisation, decision-

making, communication, and relationships between team members, and psycho-socio-emotional factors during the COVID-19 crisis. Second, it was conducted in a particular geographical area, including two hospitals in Saudi Arabia. Third, the sample size was small; therefore, the results cannot be generalised. Further empirical studies are recommended to be conducted in multiple settings with a larger number of participants to deeply explore nurses' experiences and expand the results of the current study.

Conclusion

This study revealed the unpreparedness and uneasiness of critical care nurses in their response to the COVID-19 pandemic. These nurses belong to a vulnerable population because they were overexposed to the virus and susceptible to short- and long-term psycho-emotional issues during the COVID-19 pandemic.

The safety demands of critical care nurses significantly predicted emotional exhaustion due to an increased workload during the COVID-19 pandemic crisis and their fear of contracting the deadly virus while caring for patients. Their demands on safety, organizational support, proper channels of communication, and support from their colleagues are vital for their survival and to maintain their mental health while rendering care to their patients. These demands were significant predictors of depersonalization and personal accomplishment due to their perception that staff shortage, imbalanced workload, increasing demand to provide care to patients, and fatigue might have compromised the quality of patient care and their motivation to fulfill their duties and responsibilities. Additionally, they experienced increased emotional distress and frustration in conveying their feelings of exhaustion, which led to high burnout levels. Therefore, extensive studies to further analyse their experiences should be conducted to provide clarity on various areas that cannot be addressed through a quantitative approach.

Furthermore, the results of this study suggest the need for collaboration between occupational health and safety, patient safety, quality enhancement, and infection prevention and control programs. These collaborations can provide nurses with adequate tools and knowledge to manage the effects of the COVID-19 crisis. Furthermore, the implementation of necessary health policies and guidelines may allow medical workers, especially nurses, to avoid the adverse effects of the pandemic on their physical and mental health.

Moreover, creating a working environment that does not tolerate blaming and encourages open communication, including legal and administrative protection, boosts camaraderie and improves understanding between nurses and other healthcare providers. Furthermore, insurance coverage for work-related risks, particularly for those working in high-risk facilities with patients infected with COVID-19, must be provided. More importantly, it is critical to promote work-life balance, create risk assessment and mitigation, and provide nurses with mental well-being and social support services.

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Conflict of Interest

The author declares no conflict of interest.

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