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Original Article

Nurses' resilience and burnout during COVID-19 pandemic: A cross-sectional study

Zeinab Jawad Kadhim[1], Reza Heidari-Soureshjani[2], Tayeb Mohammadi[3], Leila Sayadi[4*]

[1]Iraq Ministry of Health, Babylon Health Department, Babylon Province, Hilla, Iraq
[2]Nursing and Midwifery Care Research Center, School of Nursing & Midwifery, Tehran University of Medical Sciences, Tehran, Iran
[3]Department of Biostatistics, School of Public Health, Hamadan University of Medical Sciences, Hamadan, Iran
[4]Nursing and Midwifery Care Research Center, School of Nursing & Midwifery, Tehran University of Medical Sciences, Tehran, Iran

Abstract

Background and aims: Nurses are exposed to a variety of stresses that can cause mental health problems and lead to burnout. However, the severity of these problems in nurses also depends on their resilience. Therefore, this study aimed to investigate the correlation between nurses' resilience and burnout levels during the COVID-19 pandemic.

Methods: In this cross-sectional study, 328 nurses from four hospitals in Hilla city, Babylon province, Iraq, were enrolled in August and September 2021. Data collection tools included a demographic information form, the Anxiety, Stress, and Depression Scale (DASS-21), the Connor-Davidson Resilience Scale (CD-RISC), and the Copenhagen Burnout Inventory (CBI). The collected data were analyzed using SPSS-16 software at a significance level of 0.05.

Results: The mean resilience score among nurses was 68.05 ± 17.04, and the majority (77.4%) had a moderate level of burnout. There was a significant and inverse correlation between depression (r=-0.27, P<0.001), anxiety (r=-0.12, P<0.001), stress (r=-0.180, P<0.001), and resilience of nurses. Also, there was a significant correlation between nurses' burnout and resilience.

Conclusion: Enhancing nurses' resilience is crucial for improving their mental health and sustaining healthcare quality during crises. Future studies should explore interventions to boost resilience and examine their long-term effects on burnout and mental health. These findings help develop strategies to support nurses, ensuring better healthcare outcomes during challenging times.

Keywords: Resiliency, Burnout, Anxiety, Stress, Depression

***Corresponding Author:**
Leila Sayadi,
Emails: Sayadi117@hotmail.com, l-sayadi@sina.tums.ac.ir

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Introduction

COVID-19 is an emerging infectious disease rapidly spreading worldwide, leading to a global pandemic (1). The impact of COVID-19 has been substantial, with over 106 million reported cases, many requiring hospitalization and resulting in significant deaths (2). In Iraq, COVID-19 spread rapidly. A 2021 study reported 426 634 confirmed cases and 10 254 deaths, the highest in the Middle East after Iran (3). As of January 1, 2021, Iraq had the highest number of COVID-19 cases and deaths among Arab countries, with approximately 618 147 cases and 13 036 deaths (2).

The high number of hospital admissions due to COVID-19 creates many challenges for hospitals and those who deal with patients, such as healthcare workers (HCWs) (4). Among HCWs, nurses spend more time with patients and are at the frontline of the fight against COVID-19. Nurses contact infected patients 24 hours daily and play a key role in successfully managing this emerging disease. The global recognition of nurses' role in the current pandemic has not been achieved without cost. A significant number of nurses have been infected with COVID-19 or succumbed to it (5). Nurses are under enormous pressure due to the high risk of infection and worry about transmitting the virus to family members. Because of their direct contact with COVID-19 patients, nurses experience higher levels of stress than other HCWs. However, nurses are often exposed to other problems, such as having to wear personal protective equipment (PPE) at all times, resource limitations, especially in developing countries, and staff shortages. These issues make nurses vulnerable to physical and mental health problems (6,7). It is worth knowing that, in similar epidemics, studies have shown that nurses experience the highest levels of job stress, pressure, and anxiety compared to other HCWs (8). However, due to the longer duration of the COVID-19 pandemic, nurses have been dealing with higher levels of stress and anxiety. High levels of stress and anxiety in nurses have been reported in many countries (9,10). However, not all people exposed

to high stress levels have similar symptoms, as resilience is an essential protective factor (11).

Resilience is the ability to cope with stress and adversity. According to Connor, resilience measures an individual's capacity to handle stressors and factors that pose a risk to their mental well-being. Resilient individuals are less likely to engage in self-destructive behaviors. They are emotionally calm and can deal with adverse situations (12). Resilience has been shown to reduce the impact of traumatic events and the likelihood of psychological stress disorders (11). There are different definitions of resilience and its characteristics in nursing, but the general concept agreed upon is the ability to cope successfully despite adverse conditions (13). Nurses' resilience has been reported to be low during the COVID-19 pandemic (14). At a low level of resilience, if stress and anxiety increase, it will lead to a lack of control and burnout (15). Therefore, stress and pressure on medical staff, especially nurses, can put them at high risk of burnout. This issue has been highlighted in various studies (9,15).

According to Maslach's theory, burnout is a reaction to extreme stress at work (16). Burnout is associated with reduced performance due to negative behaviors toward work and activity. It is also associated with other psychological stressors, including moral distress, compassion fatigue, and symptoms of posttraumatic stress disorder (17,18). Burnout has been reported in recent years as one of the most severe concerns of nurses in developed and developing countries. Nurses are expected to have a caring role even in difficult working conditions. Nurses often work in demanding and high-pressure environments that significantly impact their mental health and make them susceptible to burnout (19). During the COVID-19 pandemic, burnout in nurses has increased significantly (81.6%), and this is also correlated with anxiety and depression (20). Burnout causes nurses to quit their jobs, which puts tremendous pressure on the healthcare system (15). Therefore, serious attention should be given to nurses' burnout to retain nursing staff and continue enjoying their high-quality care (13).

Since the start of the COVID-19 pandemic, several studies have been conducted on the resilience, psychological and mental health problems, and burnout of different groups of HCWs (21-23). In China, a study in 2020 showed that frontline nurses experience a variety of mental health issues, particularly burnout and fear. In this study, half of 2014 nurses had moderate and high levels of work burnout (9). Studies conducted in different countries also point to differences in work environment and its effect on burnout. In other words, cultural and structural differences in different countries can affect resilience and burnout (24). During the COVID-19 pandemic, several studies have been conducted on the correlation between resilience and burnout. However, these studies have been carried out in other countries (9,15,25), or these concepts have been studied on physicians or HCWs other than nurses (15,22, 25). In Iraq, studies conducted on this topic are minimal, and studies conducted in Iraq have only investigated stress, anxiety, and depression in physicians or in the general public (26,27). Considering the factors that influence resilience and burnout in nurses, such as cultural context, hospital equipment, and financial resources, which are different in different countries, and taking into account the gap that exists in studies on nurses' resilience and burnout during the COVID-19 pandemic in Iraq, this study was conducted to investigate the correlation between nurses' resilience and burnout during the pandemic in Iraq.

Materials and Methods

The researchers employed a cross-sectional design with a descriptive and correlational approach for this study. The sampling was carried out between August 15 and September 20, 2021.

Setting and participants

This study was conducted in four teaching hospitals in Hilla city, Iraq, including Al Hilla, Morgan, Imam Sadiq, and Alnoor hospitals. 328 nurses working in the COVID-19 wards of the above hospitals participated in this study. The inclusion criteria for nurses were working in the COVID-19 ward, having more than six months of experience caring for COVID-19 patients, having a degree in nursing (diploma, bachelor's degree, or master's degree), and being willing to participate in the study with consent. Nurses were excluded from the study if they had a known mental illness based on self-declaration or were working in several hospitals simultaneously.

Sample size

Based on a study conducted in India on the correlation between resilience and burnout in nurses during the COVID-19 pandemic (28), the sample size of this study was calculated to be 164 people using the formula $N = [(Z\alpha + Z\beta)/C]2 + 3$ with $r = -0.25$, $a = 0.05$ and $B = 0.10$.

Because the type of sampling was multistage (selection of the hospital and then the selection of nurses in the hospital), the sample size was achieved ($N = 164$) multiplied by two as the effect of the sampling plan, and the final sample size was 328, which was divided proportionally between the hospitals.

Data collection

After receiving approval letters from the Research Ethics Committee of Tehran University of Medical Sciences and heads of the selected hospitals, the researcher began to collect data. The data collection was done in several working shifts. After explaining the objectives and method of the study to the participants and obtaining their informed consent, the questionnaires were given to them for compilation. All questionnaires were given to the participants when the nurses had enough time and opportunity to complete them. Sampling was conducted using the convenience method until the sample size was reached.

The data collection tools included a demographic information form, the Anxiety, Stress, and Depression Scale (DASS-21), the 25-Item Connor-Davidson Resilience Scale (CD-RISC-25), and the Copenhagen Burnout Inventory (CBI). Demographic information included age, gender, marital status, number of children, level of education, number of working hours per week, work experience, history of hospitalization due to COVID-19, death due to COVID-19 in that family, and number of months caring for patients with COVID-19.

The DASS-21 questionnaire consisted of 21 items. Items 3, 5, 10, 13, 16, 17 and 21 were related to depression; items 2, 4, 7, 9, 15, 19 and 20 were related to anxiety; and items 18, 14, 12, 11, 8, 6 and 1 were related to stress (29). The psychometrics of the DASS-21 were conducted in Arabic (26). In the present study, Cronbach's alpha values of 0.78, 0.83, and 0.72 were obtained for the subscales of depression, anxiety, and stress, respectively.

The 25-item CD-RISC questionnaire was used to measure resilience in nurses. This tool has five subscales, including personal competence (items 10, 11, 12, 16, 17, 23, 24, 25), trust in one's instinct and tolerance of adverse outcomes (items 6, 7, 14, 15, 18, 19, 20), positive acceptance of change and safe relationship (items 1, 2, 4, 5, 8), control (items 13, 21, 22), and spiritual influences (items 3, 9). Each item in this tool is scored based on a five-point Likert scale, ranging between zero (not true at all), one (rarely true), two (sometimes true), three (often true), and four (accurate nearly all the time). The total score on this tool is between 0 and 100, with a higher score indicating higher resilience (30,31). According to studies, a score of less than 65, between 66-79, and between 80-100 on this questionnaire indicate low, moderate, and high resilience, respectively. The Arabic version of this questionnaire was obtained via email from developers, allowing us to use it. The Arabic version of the 25-item CD-RISC has also been reported to be valid (32). In the present study, a Cronbach's alpha coefficient of 0.83 was calculated after giving the questionnaire to 20 nurses to complete.

The CBI was used to measure burnout in nurses. The CBI is a tool (19 items) with three subscales. Six items are related to personal burnout, seven to work-related burnout, and six to client/patient-related burnout. The questions are answered based on a five-point Likert scale, ranging between never/almost never/a very low degree (score = 0), rarely to a low degree (score = 25), sometimes to somewhat (score = 50), often to a high degree (score = 75), and always to a very high degree (score = 100). The mean score for each subscale is considered the total score. The total score of each subscale is classified as low (less than 25), medium (25-75), and high (more than 75). A score of more than 50 indicates the presence of burnout in the respondent (33). This tool has been used in other studies conducted in Iraq (27). The reliability of this tool was confirmed using 20 nurses who completed the questionnaire, and a Cronbach's alpha of 0.79 was obtained. The questionnaires used in this study have been translated into Arabic and used in various studies with acceptable reliability.

Data analysis

Data for qualitative and quantitative variables were summarized and reported by frequency (percentage) and mean (standard deviation), respectively. In addition, the normality of quantitative variables used in the analysis was evaluated by skewness and Kolmogorov–Smirnov tests. Correlation analysis was performed to examine the correlation between individual and quantitative contextual variables and between resilience and burnout. General linear modeling examined the correlation between the study variables and the contextual variables. Data analysis was performed using SPSS-16 software at a significance level of 0.05.

Results

Out of 350 people, 328 completed the questionnaires. The mean age of the nurses participating in this study was 26.62 ± 6.799 years, and most (58.5%) were female. Most of the nurses had a nursing diploma (40.5%). The mean work experience of nurses was 4.83 ± 6.958 years. The mean number of months they cared for patients with COVID-19 was 10.52 ± 4.061 months. The results showed that the mean scores of depression, anxiety, and stress of nurses were 15.98 ± 9.15, 17.56 ± 8.89, and 14.83 ± 9.12, respectively (Table 1).

Table 1. Participants' demographics and depression, anxiety and stress (N = 328)

Variable		No. (%)/Mean ± SD
Age(year)		26.62 ± 6.799
Gender	Female	192(58.5)
	Male	136(41.5)
Marital State	Single	181(55.2)
	Married	140(42.7)
	Divorced	5(1.5)
	Widow	2(0.6)
Number of Children	0	214(65.2)
	1-3	90(27.4)
	4-8	24(7.3)
Educational degree	Bachelors' degree	118(36)
	Diploma	133(40.5)
	Secondary school	77(23.5)
Hospitalization	Yes	36(11)
	No	292(89)
Death due to COVID-19	Yes	2(0.6)
	No	326(99.4)
Work experience(year)		4.83 ± 6.958
Working hours per week		32.6 ± 6.90
Duration of caring for COVID-19 patients		10.52 ± 4.061
Depression		15.98 ± 9.15
Anxiety		17.56 ± 8.89
Stress		14.83 ± 9.12

The mean CD-RISC-25 score was 68.05 ± 17.004. The results showed that 124 nurses (37.8%) had low levels of resilience, while 109 nurses (33.2%) and 95 nurses (29%) had moderate and high levels of resilience, respectively. The mean scores of "personal competence," "trust in one's intuition," "accept changes," "control," and "spiritual influences" were 24.10 ± 6.655, 16.30 ± 5.238, 12.83 ± 4.003, 8.95 ± 2.59, and 5.87 ± 1.876, respectively. The majority of nurses (77.4%) had moderate levels of burnout. Of all nurses, 41.8% obtained a score of more than 50, while 58.2% obtained a score of less than 50 on the CBI. Among all nurses, 69.2% had a moderate level of personal burnout, 70.1% had a moderate level of work-related burnout, and 60.7% had a moderate level of client-related burnout (Table 2).

The results showed that among the variables, there was only a significant and inverse correlation between depression, anxiety, stress, and resilience, and a positive and significant correlation was found between depression, anxiety, stress, and burnout. Burnout was also higher in younger nurses (Table 3).

There was a significant correlation between nurses' burnout and resilience ($P = 0.048$). The results showed that with an increase of one month in caring for patients with COVID-19, the level of nurses' CBI increased by 0.49 ($P = 0.034$). In addition, with an increase of one point in the nurses' depression and anxiety, their CBI levels increased by 0.37 and 0.89, respectively (Table 4).

Discussion

This study aimed to investigate the correlation between nurses' resilience and burnout levels during the COVID-19 pandemic, focusing on those working in teaching hospitals in Hilla city. The findings indicate that higher levels of resilience are associated with lower levels of depression, anxiety, and stress, thereby mitigating burnout. These results underscore the importance of fostering resilience among nurses to enhance their mental health and reduce burnout, especially in the face of unprecedented challenges such as COVID-19. Additionally, the study revealed significant levels of depression, anxiety, and stress among nurses. Stress and anxiety are common in critical and unpredictable situations like the COVID-19 pandemic. During the COVID-19 pandemic, there were many instances in which nurses and HCWs working in the respiratory wards wrote their wills and revealed

Table 2. CD-RISC-25 and CBI scores of nurses (N = 328)

			Mean ± SD/No. (%)	Standard score range	Min–Max
25-item CD-RISC	Personal competence		24.10 ± 6.655	0–32	2-32
	Trust in own intuition		16.30 ± 5.238	0–28	2-28
	Accept changes		12.83 ± 4.003	0–20	1-20
	Control		8.95 ± 2.59	0–12	0-12
	Spiritual influences		5.87 ± 1.876	0–8	0-8
	Total resilience score		68.05 ± 17.004	0–100	11- 98
	Level of resilience	Low (< 65)	124(37.8)	-	-
		Moderate (66-79)	109(33.2)	-	-
		High (80-100)	95(29)	-	-
CBI	Personal burnout		49.97 ± 22.04		0-100
		Low (less than 25)	60(18.3)		
		Moderate (25-75)	227(69.2)		
		High (more than 75)	41(12.5)		
	Work-related burnout		47.38 ± 21.83		0-96
		Low (less than 25)	65(19.8)		
		Moderate (25-75)	230(70.1)		
		High (more than 75)	33(10.1)		
	Client-related burnout		40.70 ± 23.18		0-100
		Low (less than 25)	110(33.5)		
		Moderate (25-75)	199(60.7)		
		High (more than 75)	19(5.8)		
	CBI Total		46.09 ± 19.23		0-97
		Low (less than 25)	51(15.5)		
		Moderate (25-75)	254(77.4)		
		High (more than 75)	23(7)		
	CBI categorization	Less than 50	191(58.2)		
		More than 50	137(41.8)		

Table 3. Baseline characteristics of nurses in terms of resilience and burnout

Variables	No. (%)	Resilience		Burnout	
		Mean ± SD/Pearson	*P* value	Mean ± SD/Pearson	*P* value
Age*		0.04	0.474	-0.160	0.004
Gender					
Female	192(58.5)	67.99 ± 16.93	0.934	47.81 ± 18.57	0.053
Male	136(41.5)	68.15 ± 17.18		43.65 ± 19.95	
Marital status					
Single	181(55.2)	66.88 ± 18.19	0.165	47.7 ± 19.26	0.093
married/divorced/widow	147(44.8)	69.5 ± 15.35		44.11 ± 19.09	
Level of Education					
Diploma	133(40.5)	67.65 ± 18.33	0.725	44.91 ± 19.2	0.358
Bachelor & Secondary	195(59.5)	68.33 ± 16.08		46.9 ± 19.26	
Infection with COVID-19					
No	161(49.1)	68.37 ± 16.13	0.74	48.01 ± 19.19	0.076
Yes	167(50.9)	67.75 ± 17.85		44.24 ± 19.15	
Hospitalization					
No	292(89)	68.14 ± 16.86	0.788	46.32 ± 19.02	0.566
Yes	36(11)	67.33 ± 18.38		44.19 ± 21.1	
Depression		-0.273	<0.001	0.554	<0.001
Anxiety		-0.124	0.025	0.621	<0.001
Stress		-0.180	0.001	0.530	<0.001

Table 4. The results of multiple linear regression for factors associated with burnout

Independent variable	Coefficient	SE	*P* value	95% CI
Resilience score	0.10	0.05	0.048	0.001-0.200
Age	-0.12	0.22	0.587	-0.543-0.308
Gender (male versus female)	-1.27	1.88	0.501	-4.978-2.438
Marital status (married/divorced/widow vs. single)	2.18	2.19	0.320	-2.123-6.477
Number of Children	-1.19	1.14	0.296	-3.420-1.046
Level of Education (bachelor &secondary vs. diploma)	4.26	1.71	0.013	0.892-7.626
Number of working hours per day	-0.16	0.12	0.189	-0.397-0.079
Duration of caring for COVID-19 patients	0.49	0.23	0.034	0.038-0.940
Infection with COVID-19(yes vs. no)	-1.33	1.76	0.451	-4.788 - 2.133
Hospitalization (yes vs. no)	-2.14	2.77	0.439	-7.591-3.304
Depression	0.37	0.16	0.024	0.048-0.688
Anxiety	0.89	0.16	<0.001	0.575-1.210
Stress	0.24	0.15	0.108	-0.052-0.523

important passwords to their family members due to death anxiety (34). In addition, the possibility of transmitting the infection to family members, the unavailability of adequate PPE, long working hours, and moral distress were some of the challenges that nurses experienced during the COVID-19 pandemic, which further increased stress and depression symptoms in nurses (35,36). The results of a study conducted in China on burnout, anxiety, depression, fear, and related factors in frontline nurses during the COVID-19 pandemic showed that 288 (14.3%) and 217 (10.7%) nurses who participated in the study experienced moderate and high levels of anxiety and depression, respectively (9).

The results of the present study also showed that the mean score of the CD-RISC-25 in nurses was 68.05 ± 17.004. Regarding the level of resilience, the results showed that 109 nurses (37.8%) had a low level of resilience, 109 nurses (33.2%) had a moderate level of resilience, and 95 nurses (29%) had a high level of resilience. This is in line with other studies that have also shown the mean resilience score of nurses in all countries to be moderate (37,38). Nurses' levels of resilience have been reported differently in different studies during the COVID-19 pandemic. For example, in a study conducted in Lebanon, the mean resilience score of nurses during the COVID-19 pandemic was 66.91 ± 13.34 (39). A study

to determine the level of resilience in nurses working in COVID-19 centers in Iran showed that the mean score of resilience of nurses was 63.8 ± 16.2, which indicates a moderate to high level of resilience in nurses (40). In another study on the resilience of nurses working in respiratory wards during the COVID-19 pandemic in the United Kingdom, of 180 nurses, 50 (27.8%), 67 (37.2%), and 29 (16.1%) nurses had moderate, moderate to high and high levels of resilience, respectively (14). As the results of these studies indicate, nurses' resilience to COVID-19 varies from country to country and from area to area. The results of a study examining nurses' resilience in Japan, South Korea, Turkey, and the United States during the COVID-19 pandemic showed that the level of resilience of nurses in the United States was significantly higher than that of nurses in other countries. This may be due to nurses' public appreciation, satisfaction, and compassion in the United States. The respect, organizational support, public appreciation, and trust of nurses and their health and well-being can increase nurses' resilience (37). Additionally, numerous factors, such as individual personality, interpersonal correlation, social contexts, genetics, work environment, family, community, coping skills, self-efficacy, social support, and environmental, biological, and psychological factors, have been shown to affect resilience in difficult and stressful situations (41). A study showed that the Iraqi personality is extroverted and can adapt and harmonize with the environment and social surroundings (42).

The majority of nurses (77.4%) in this study had moderate levels of burnout. Of all nurses, 41.8% obtained a score of more than 50, while 58.2% obtained a score of less than 50 on the CBI. Burnout is one of the health problems of HCWs worldwide, especially nurses and physicians. Before the COVID-19 pandemic, many systematic reviews and meta-analyses revealed moderate to high levels of burnout in nurses. However, during the COVID-19 pandemic, nurses' level of burnout has reached a higher level (43). The results of a study conducted in China among frontline nurses during the COVID-19 pandemic showed that some nurses had moderate burnout levels, while half had high levels of burnout (9). A study in Japan showed that out of 369 HCWs, the overall prevalence of burnout was 31.4%, and out of 126 nurses, 59 nurses (46.8%) had a high level of burnout during the COVID-19 pandemic, so it was concluded that the level of burnout in nurses was higher than that in other HCWs (24). The high prevalence of burnout in nurses in the present study may be due to the shortage of nurses, resource limitations, a high number of hospital admissions due to COVID-19, high workload, the obligation to wear PPE at all times, fear of infection, and concern over transmitting the virus to family members.

The present study found a significant correlation between burnout and nurses' resilience. The results also showed that an increase in the time spent caring for patients with COVID-19 increases nurses' level of burnout. In addition, an increase in the nurses' level of depression and anxiety also increases their burnout. Before COVID-19, various studies pointed to a significant and inverse correlation between resilience and burnout (15,44,45). Studies conducted during COVID-19 have also produced similar results (46). A study conducted in Wuhan, China, in 2021, to assess the correlation between resilience and burnout of frontline nurses at the peak of the COVID-19 pandemic showed that burnout and mental health problems were significantly and inversely correlated with resilience (9). However, another study conducted in Portugal showed that depression had a direct effect on the personal burnout of HCWs, but resilience had a minor mediating role between depression and burnout. In this regard, a study showed that social communication, self-esteem, and self-compassion have positive effects on depression and burnout (22). However, almost all studies have shown that stress, anxiety, and depression are inversely correlated with resilience and positively correlated with burnout.

Resilience is expected to be a significant predictor of nurses' burnout. However, in this study, there was a positive and significant correlation between burnout and resilience, which might be due to some Iraq-related factors, such as the exposure of Iraqi civilians to traumatic events for a long time, even until now. The effects of these events become cumulative over a long time, which makes Iraqi society different from other societies.

Moreover, the Iraqi population has been exposed to a multitude of adverse events, including war, economic sanctions, foreign invasion, occupation, terrorism, and sectarian conflict, spanning over three decades. These experiences contribute to the Iraqi people's unique characteristics and personality traits. The prolonged occurrence of these events in Iraq has resulted in significant psychological and health-related challenges for its population. Traumatic experiences have been identified as potential risk factors for various forms of mental disorders, either directly or indirectly. This suggests that Iraqi families may have encountered unique events distinct from those experienced by other groups.

On the other hand, Iraqi culture may play a protective role against traumatic and adverse events. For instance, in Iraq, a traumatized person receives a high level of emotional/financial support from his/her family and society. Additionally, religion and belief in Muslim society are crucial factors in times of crisis. Religion plays a vital role in Eastern Muslim life. Therefore, Iraqi people rely on God to help them resolve their problems. In this regard, a study investigating the personality traits, trauma, and symptoms of *post-traumatic stress disorder* in an Iraqi population revealed that people who had learned from their experiences described themselves as becoming more potent than before exposure to hardship. This factor may have contributed to the increased adaptability and resilience of the Iraqi population and nurses in general

(42). Perhaps crises can have desirable effects, such as enhancing personal adaptation skills and refining internal resources to build patience and perseverance (39).

The results of the present study showed that it is essential for healthcare managers and policymakers to be aware of burnout among nurses working in COVID-19 wards and to provide appropriate strategies to prevent or reduce burnout in nurses. It is essential to prioritize mental health issues and create a healthy work environment to prevent or reduce burnout in nurses. This can be achieved by reducing workload through adjusting work shifts and minimizing job-related stressors. These proactive measures address the unique challenges nurses face and promote their well-being. Furthermore, more extensive, multicenter studies on HCWs during the COVID-19 pandemic are needed to identify factors that affect nurses' burnout and to develop effective preventive strategies to reduce or eliminate burnout in Iraqi HCWs, especially nurses.

Strengths and limitations

Burnout might have been present in nurses even before the COVID-19 pandemic, which was not considered in this study. This study was conducted when Iraq was facing the second peak of COVID-19. The duration of this study may limit the generalizability of its results to other situations where the number of patients hospitalized due to COVID-19 is low. The duration of exposure and the progress made in preventing and treating COVID-19 patients can affect nurses' resilience, stress, anxiety, and burnout. However, control of this variable was beyond our control.

Conclusion

This study underscores a significant link between nurses' resilience and burnout levels amid the COVID-19 pandemic in Hilla City's teaching hospitals. Higher resilience is associated with reduced depression, anxiety, and stress, thus reducing burnout and ensuring sustained healthcare quality during crises. Despite encountering moderate to high burnout levels while caring for COVID-19 patients, nurses exhibit moderate to high resilience, potentially moderating burnout and facilitating effective patient care. Notably, a positive correlation exists between burnout and resilience, while depression, anxiety, and stress show inverse relationships with both burnout and resilience. These findings emphasize the urgent need for healthcare policymakers to implement strategies aimed at alleviating depression, anxiety, stress, and burnout among nurses on the frontline of COVID-19 care. Such interventions promise to enhance staff performance, accelerate pandemic control efforts, and optimize patient treatment, thus enhancing overall healthcare outcomes.

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Authors' Contribution

Conceptualization: Zeinab Jawad Kadhim, Leila Sayadi.
Data curation: Reza Heidari-Soureshjani, Leila Sayadi.
Formal analysis: Reza Heidari-Soureshjani, Tayeb Mohammadi.
Investigation: Zeinab Jawad Kadhim, Reza Heidari-Soureshjani.
Methodology: Reza Heidari-Soureshjani, Leila Sayadi.
Project administration: Leila Sayadi.
Software: Tayeb Mohammadi.
Supervision: Leila Sayadi.
Validation: Leila Sayadi.
Visualization: Tayeb Mohammadi.
Writing–original draft: Zeinab Jawad Kadhim, Reza Heidari-Soureshjani.
Writing–review & editing: Zeinab Jawad Kadhim, Reza Heidari-Soureshjani, Tayeb Mohammadi, Leila Sayadi.

Competing Interests

There are no conflicts of interest to declare.

Ethical Approval

This study is the result of a registered research project (1400-3-160-55490) approved by the research ethics committees of the schools of nursing & midwifery and Rehabilitation, Tehran University of Medical Sciences (IR.TUMS.FNM.REC.1400.094).

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