BMC Nursing

RESEARCH

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Psychological distress and resilience among Jordanian nurses in critical care units following the second wave of the COVID-19 pandemic: a cross-sectional study

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Abstract

Background There is limited research on the psychological impact of COVID-19 and resilience among critical care nurses in Arab countries. This study assessed psychological distress, including stress, anxiety, depression, and resilience, among Jordanian critical care nurses following the pandemic's second wave.

Methods This study employed a cross-sectional design and involved 260 registered Jordanian nurses working in critical care units across three healthcare sectors (government, private, and educational). The data collection took place from June to August 2022, using the Depression Anxiety Stress Scale (DASS 42) and the Connor-Davidson Resilience Scale (CD-RISC).

Results The findings revealed that over half of the critical care nurses experienced moderate to extremely severe anxiety (57.7%). Approximately 50.0% of nurses reported moderate to extremely severe depression, while 33.5% experienced moderate to extremely severe stress. Additionally, more than half of the nurses (66.5%) had low resilience. A significant positive correlation was found between resilience and marital status ($r = 0.210$, $p < 0.01$), while a significant negative correlation was observed between resilience and anxiety ($r = -0.128$, $p < 0.05$).

Conclusion This study could assist hospital managers and healthcare professionals in developing training programs and workshops to reduce psychological issues and improve resilience among critical care nurses.

Clinical Trial No.

Keywords Anxiety, Critical care units, Depression, Resilience, Stress

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Introduction

Nursing is a vital profession within the healthcare system, requiring significant effort to provide patients with the best possible care. However, the demanding work environment often leads nurses to experience adverse psychological conditions such as stress, depression, and anxiety [1–3]. Previous research has highlighted the high prevalence of psychological distress among nurses and the negative impact these issues have on both their psychological well-being and the quality of care they provide [2, 4–9].

Critical care units are high-stress environments that require intensive labor, the use of advanced medical technology, and constant vigilance because of patients' critical conditions [10, 11]. The emotional burden is further intensified by life-threatening situations and the distress experienced by patients' families [10, 11]. The COVID-19 pandemic exacerbated these pressures, resulting in increased anxiety, depression, and stress among nurses [2, 12]. Stress in healthcare often manifests as anxiety, emotional strain, and difficulty adapting, with symptoms varying based on individual circumstances [13, 14]. Anxiety is particularly prevalent due to the uncertainty of medical outcomes, a challenge that is heightened for critical care nurses managing life-threatening cases [15, 16]. Additionally, depression contributes to absenteeism, reduced motivation, poor performance, and disengagement from workplace protocols [14]. Without sufficient systemic support, some nurses have faced severe psychological consequences, including suicide [17]. These challenges underscore the urgent need for institutional mental health interventions and protective measures.

Critical care nurses are often exposed to psychological distress due to the intense, high-stakes environment in which they work. The COVID-19 pandemic amplified these challenges, highlighting the need for research on resilience as a coping mechanism [18, 19]. Resilience is a vital quality that assists nurses in managing workplace challenges [19]. Research has shown that resilience enhances nurses' professional skills, fosters greater happiness in both work and life, reduces psychological distress and fatigue [9, 20], increases life and job satisfaction, and lowers the likelihood of job turnover or the intention to leave [20]. In contrast, lower levels of resilience have been linked to higher levels of stress, anxiety, and depression among nurses [9, 21, 22].

The second wave of COVID-19 in Jordan began in early February 2021, peaked around mid-March 2021, and subsided by mid-May 2021. This wave was marked by a significant increase in daily reported cases and a higher percentage of positive qPCR tests compared to the first wave. Despite the initial success in controlling the virus through strict lockdown measures, the easing of restrictions and noncompliance with health precautions contributed to the resurgence of cases [23, 24]. According to the Ministry of Health in Jordan, by March 15, 2021, the cumulative number of confirmed COVID-19 cases reached 486,470, with 5,428 deaths attributed to the virus. These figures highlight the severity of the second wave and its substantial impact on public health in Jordan [25].

Previous studies have shown that psychological distress is correlated with resilience and can affect it [9, 21, 26–29]. Additionally, factors such as age [26], sex [26], marital status [26, 30], educational level [26], experience in critical care units [26], and the healthcare sector [21] have all been found to correlate with resilience. However, there remains a gap in the existing literature concerning the relationship between psychological distress and resilience among nurses working in critical care units within Jordanian healthcare settings following the second wave of COVID-19. While international studies have explored these variables independently or in other contexts, limited research has specifically addressed how frontline nurses in Jordan coped with the psychological challenges during and after the second wave. Understanding this relationship is crucial for developing targeted mental health support and resilience-building interventions for healthcare professionals in similar high-stress environments. Emphasizing prevention at the system level may reduce the number of nurses experiencing acute mental health crises or burnout [17]. Therefore, this study aimed to assess the relationship between psychological distress (e.g., stress, anxiety, and depression) and resilience among critical care nurses in Jordan after the second wave of COVID-19. The following research questions guided the study:

1. What are the levels of psychological distress (e.g., stress, anxiety, and depression) and resilience among participants?
2. What is the relationship between selected sociodemographic characteristics (age, sex, marital status, educational level, experience in critical care units, and health sector), psychological distress (e.g., stress, anxiety, and depression), and resilience among participants?
3. What are the predictors of resilience among participants?

Methods

Design, setting, population, and sample

This study employed a cross-sectional design to examine the relationship between resilience and psychological distress among Jordanian nurses working in critical care units. The target population consisted of all registered nurses (RNs) employed in critical care units across government, private, and educational hospitals in Jordan. A

convenience sample was selected from hospitals in the Amman and Irbid governorates. The sample size was determined using G*power, with an alpha of 0.05, an effect size of 0.08, and a power of 0.85 with 10 predictors, resulting in a minimum required sample size of 260 nurses. An additional 10% of participants were included to account for incomplete surveys. The final sample comprised all eligible RNs working in critical care units.

The study included critical care nurses who met the following eligibility criteria: (1) a minimum of one year of experience, ensuring familiarity with relevant policies and required competencies, (2) active involvement in direct patient care, as these nurses are typically the most affected during health crises such as the COVID-19 pandemic, and (3) who were willing to participate in the study. Nurses in managerial roles were excluded from the study, as their distinct responsibilities may expose them to different challenges, and it was assumed they might possess greater resilience or more effective coping mechanisms.

Ethical considerations

The Institutional Review Board (IRB) at Al-Zaytoonah University of Jordan approved the current study. Additional approvals were also obtained from the Ministry of Health/Jordan, King Abdullah Hospital, and private hospitals. All eligible participants provided written informed consent. They were informed that participation was voluntary. They were also instructed not to include their names or any personal information. Participants were also assured that their data would be securely stored and that they could withdraw from the study at any time without facing any consequences.

Study measurements

Data were collected using a structured self-reported survey, which included several sections: demographic information (age, gender, marital status, educational level, years of experience, and health sector), the Depression Anxiety Stress Scale (DASS 42), and the Connor-Davidson Resilience Scale (CD-RISC).

The DASS 42 consists of 42 items, divided into three dimensions—depression, anxiety, and stress—each with 14 items. Each item is rated on a 4-point Likert scale, ranging from 0 (not applicable to me at all) to 3 (applies to me very much or most of the time). Scores for each item are summed to obtain a total score for each dimension, which is then multiplied by 2. The scoring ranges for each dimension are as follows: depression: 0–9 (no depression), 10–13 (mild), 14–20 (moderate), 21–27 (severe), and over 28 (extremely severe). Anxiety: 0–7 (normal anxiety), 8–9 (mild), 10–14 (moderate), 15–19 (severe), and over 20 (extremely severe). Stress: 10–14 (no stress), 15–18 (mild), 19–25 (moderate), 26–33 (severe), and over 34 (extremely severe). The DASS 42 passed tests of discriminative, concurrent, and convergent validity [31]. The scale has also demonstrated acceptable reliability, with Cronbach's alpha values of 0.94 for depression, 0.87 for anxiety, and 0.91 for stress [32]. A subsequent adaptation of the scale to Arabic by Moussa et al. [33] confirmed its validity and reliability, with a Cronbach's alpha of 0.95. In this study, Cronbach's alpha was 0.96.

The Connor-Davidson Resilience Scale (CD-RISC) was used to assess the level of resilience among participants. This scale evaluates key domains including personal competence, tolerance of negative emotions and stress, positive adaptation to change, sense of control, and spirituality or a sense of purpose [34]. It consists of 25 items, each measured on a 5-point Likert scale ranging from 0 (not true at all) to 4 (true nearly all of the time). The scores for each item were summed to calculate a total score, which ranged from 0 (no resilience) to 100 (perfect resilience). The resilience levels were categorized as follows: low resilience (0–73), mild resilience (74–82), moderate resilience (83–90), and high resilience (91–100). This scale has demonstrated validity and reliability, with a Cronbach's alpha of 0.89 [34]. For this study, the Arabic version of the instrument, which was obtained from the original author and was valid and reliable [35], was used. The Cronbach's alpha in this study was 0.92.

Data collection procedure

Data collection began once ethical approval was obtained from the selected hospitals. Coordination was then established with the nursing managers of the critical care units, who were briefed on the study and its inclusion criteria. The head nurses provided a master list of eligible nurses. The surveys, including the consent form, were distributed in sealed envelopes to the head nurses for further distribution to eligible nurses. After one week, the completed envelopes were collected from the head nurses at each participating hospital. Data collection was conducted from June 2022 to August 2022.

Data analysis

The study data were entered and analyzed using the Statistical Package for Social Sciences (SPSS), version 26. To minimize data entry errors, the data were double-checked. Outliers and missing data were identified and addressed by examining measures of central tendency, as well as the minimum and maximum values. Frequency measures were used to confirm that the data were normally distributed. Descriptive statistics (e.g., frequency, percentage, mean, and standard deviation (SD)) were used to describe the research variables. Pearson's and Point-biserial correlation tests were adopted to assess the relationships between variables. A multivariable linear regression analysis was conducted to identify the main

Table 1 Sociodemographic characteristics of the study sample (N = 260)

Characteristics	Category	N(%)
Age/ Years		
M = 30.8, SD = 6, Range = 22–56		
Gender		
	Male	115 (44.2)
	Female	145 (55.8)
Marital status		
	Single	121 (46.5)
	Married	139 (53.5)
Educational level		
	Bachelor	230 (88.5)
	Higher than bachelor	30 (11.5)
Health sector		
	Governmental	102 (39.2)
	Private	126 (48.5)
	Educational	32 (12.3)
Number of experiences in critical care units /Years		
M = 5.83, SD = 5.0, Range = 1–26		

N = number, %= percentage, SD = Standard Deviation, m = Mean,

Table 2 Levels of psychological problems and resilience among critical care nurses (*N* = 260)

Variables	n	%	M (SD)
Depression			14.7 (10.02)
No depression (0-9)	99	38.1	
Mild depression (10-13)	30	11.5	
Moderate depression (14-20)	57	21.9	
Severe depression (21-27)	41	15.8	
Extremely severe depression (28 and above)	33	12.7	
Anxiety			12.7 (9.08)
No anxiety (0-7)	86	33.1	
Mild anxiety (8-9)	24	9.2	
Moderate anxiety (10–14)	55	21.2	
Severe anxiety (15–19)	30	11.5	
Extremely severe anxiety (20 and above)	65	25.0	
Stress			15.2 (9.07)
No stress (0–14)	134	51.5	
Mild stress (15-18)	39	15.0	
Moderate stress (19-25)	48	18.5	
Severe stress (26-33)	32	12.3	
Extremely severe stress (34 and above)	7	2.7	
Resilience			61.3 (22.47)
Low (0– 73)	173	66.5	
Mild (74– 82)	32	12.3	
Moderate (83– 90)	26	10.0	
High (91– 100)	29	11.2	

m = Mean N = number, SD = Standard Deviation %= percentage

Table 3 Correlating factors of resilience

Variable	Resilience	
	r	p-value
Age	0.085	0.172
Experience	0.096	0.121
Stress	-0.018	0.774
Anxiety	-0.128	0.039*
Depression	-0.114	0.066
	r p.b	p-value
Gender	0.090	0.149
Marital status	0.210	0.001**
Educational level	0.014	0.819
Health sector	-0.074	0.234

r p.b = point biserial correlation, r = Pearson correlation

* Significant at p ≤ 0.05, ** Significant at p ≤ 0.01

predictors of resilience. A p-value of ≤ 0.05 was considered statistically significant.

Results

Of 286 distributed surveys, 260 were completed with a response rate of 90.9%. Regarding the demographic characteristics, the participants had a mean age of 30.8 years (SD = 6.0), with ages ranging from 22 to 56 years. Of the participants, 55.8% were female, 53.5% were married, and 48.5% worked in private hospitals. Most of the participants held a bachelor's degree (88.5%). The average work experience in critical care units was 5.8 years (see Table 1).

The study found that over half of the participants experienced moderate to extremely severe anxiety (57.7%). Approximately 50.0% of them reported moderate to extremely severe depression, while 33.5% reported moderate to extremely severe stress. Regarding resilience, more than half of the participants (66.5%) reported low resilience (see Table 2).

Table 3 presents the correlation between sociodemographic characteristics, psychological distress, and resilience. The findings indicated a significant positive correlation between resilience and marital status ($r = 0.210$, $p < 0.01$). In contrast, a significant negative correlation was found between resilience and anxiety ($r = -0.128$, $p < 0.05$). However, no statistically significant correlations were observed between resilience and the other study variables.

A multivariable regression analysis was conducted to identify the predictors of resilience among participants. The assumptions for regression were checked, with the variance inflation factor (VIF) and tolerance statistics used to assess multicollinearity, which is considered a concern if the VIF value exceeds 10 or the tolerance value is below 0.1. The autocorrelation assumption was evaluated using the Durbin-Watson (DW) coefficient, which was 1.417. For the regression model, which included

Table 4 Predictors of resilience: multiple linear regression

Predictors	b	B	t	p-value	0.95% CI		Correlation	
					lower	upper	Partial	Part
Anxiety	-0.295	-0.119	-1.967	0.050	-0.590	0.000	-0.122	-0.119
Marital status	9.209	0.205	3.380	0.001	3.843	14.575	0.206	0.205

CI = Confidence Interval, b = Standardized beta, B = unstandardized beta

anxiety and marital status as independent variables, the VIF and tolerance values were within the normal range, indicating acceptable levels of autocorrelation.

As shown in Table 4, the variables that correlated with resilience, including marital status and anxiety, were entered into the predictor model. The complete model, which accounted for all resilience predictors, was statistically significant ($F_{(2, 258)} = 7.960$, $p \leq 0.001$, $R = 0.242$, $R^2 = 0.058$, adjusted $R^2 = 0.051$, df = 2). This indicates that 5.8% of the variance in resilience was explained by the model. The results showed that anxiety and marital status were significant predictors of resilience ($\beta = -0.295$, $p \leq 0.001$; $\beta = 9.209$, $p < 0.01$), respectively. Furthermore, the beta coefficient for anxiety was − 0.119, indicating that a one-point increase in anxiety was associated with a 0.119 decrease in resilience. In contrast, the beta coefficient for marital status was 0.205, meaning that being married (compared to being single) was associated with a 0.205 increase in resilience. Although the model's R-squared was low, the identified predictors (anxiety and marital status) had statistically significant associations with resilience, suggesting these are key areas for intervention.

Discussion

This study is among the few efforts to assess the relationship between psychological distress and resilience among Jordanian nurses in critical care units following the second wave of COVID-19.

Our study found that one-third of participants reported moderate to extremely severe levels of stress. Other studies conducted among nurses during the COVID-19 pandemic [2, 6, 21, 36–42] reported high stress levels among the majority of nurses. Also, the findings of this study indicate higher stress levels compared to earlier studies [43–45], which found that nurses experienced moderate stress. In contrast, other studies [46–49] conducted during the COVID-19 pandemic reported lower stress levels. This finding may be attributed to the challenging workplace environment in critical care settings, where nurses frequently care for patients with complex medical conditions, face ethical dilemmas related to end-of-life care, and interact with the families of dying patients [50]. These nurses often report feeling stressed due to administrative issues such as a shortage of qualified staff, inadequate support from nursing managers, low pay, and excessive demands [51]. The COVID-19 pandemic intensified stress levels among frontline critical care nurses due to heightened risks and prolonged exposure to life-threatening situations [2].

This study found that more than half of the participants reported moderate to extremely severe levels of anxiety, consistent with several studies conducted during the COVID-19 pandemic [2, 7, 21, 37, 40, 42, 52–54]. Additionally, this result was higher than findings from earlier studies [45, 47, 49, 55], which reported lower anxiety levels. This heightened anxiety may be linked to an increased sense of responsibility for patient care, leading to empathy fatigue. Empathy fatigue occurs when healthcare professionals become overly involved with patients, compromising their objectivity and competence due to emotional exhaustion caused by prolonged exposure to suffering. Such fatigue can lead to learned helplessness and emotional burnout [28]. During the COVID-19 pandemic, anxiety levels surged as nurses were on the front lines, facing overwhelming challenges such as rising patient numbers, insufficient hospital capacity, a lack of clear protocols, and the constant fear of potentially infecting their families [21, 28].

Our study found that half of the participants experienced moderate to extremely severe levels of depression, consistent with several studies conducted during the COVID-19 pandemic [2, 6, 7, 21, 37, 40, 42, 46, 52, 54]. However, our findings were higher than those of other studies conducted during COVID-19 [45, 47, 49], which reported lower levels of depression. The high levels of depression observed in this study can be attributed to several factors, including increased working hours, a higher number of patients in critical care units, low monthly income, night shifts, and the pressures associated with working in private hospitals, which often demand more from their staff [56]. Furthermore, since this study was conducted after the COVID-19 pandemic, it highlights the need for nurses to adopt effective mental health strategies and work in a supportive environment to address these challenges.

The results of this study indicated that participants reported low resilience, a finding consistent with previous research conducted during the COVID-19 pandemic [22, 26, 30, 55, 57, 58]. The low resilience levels were primarily attributed to heightened anxiety, stress, and depression among nurses [21]. During the pandemic, the decline in resilience was particularly pronounced

among nurses working in critical care units, due to the increased psychological strain caused by changes in work and social conditions, as well as heightened risk factors and fears of infection [21, 26]. Additionally, factors such as limited practical experience, younger age, and insufficient personal protective equipment also contributed to low resilience [21, 26].

This study found a negative correlation between resilience and anxiety, which aligns with previous research [21, 22, 28, 59, 60], which highlighted a significant relationship between nurses' resilience and anxiety. This negative correlation is explained by the fact that anxiety has a substantial impact on resilience among critical care nurses [59]. Anxiety can undermine resilience by affecting nurses' ability to manage work-related challenges and conflicts [61, 64].

Our study revealed a positive correlation between resilience and marital status, which aligns with the results of Yu et al. [30]. Married nurses demonstrated higher levels of resilience compared to their single counterparts. These findings support previous research, which indicated that married nurses experience greater life satisfaction and lower levels of emotional stress [62]. This result may be attributed to the fact that married nurses tend to have stronger social connections, and social support is positively associated with resilience [63].

Implications for clinical practice

Overall, this study provides baseline data on depression, anxiety, and stress, while also exploring key factors influencing resilience among Jordanian critical care nurses. It is one of the first studies in Arab countries to examine these variables in the post-COVID-19 context. To enhance nursing care standards and promote psychological well-being, healthcare professionals should use the study's findings to develop training programs aimed at increasing resilience and addressing psychological issues that could negatively influence nurses' job performance.

Nursing managers can use the study's findings to identify the appropriate support for staff who are at risk or already experiencing psychological distress. The results can also guide outreach nurses in designing educational training, workshops, and programs focused on increasing knowledge and skills related to the risks, effects, and management of stress, anxiety, and depression. Policymakers can use these findings to develop policies and guidelines that institutionalize strategies to help nurses cope with psychological challenges in the workplace, thereby enhancing resilience. Most importantly, the study's findings can benefit patients by ensuring that well-supported nurses, who can effectively manage their psychological issues, deliver safe and high-quality care in critical care units. In light of these challenges, healthcare institutions should consider implementing targeted strategies to support nurse resilience. Examples include structured resilience training programs (e.g., stress management workshops, mindfulness-based interventions, and cognitive-behavioral strategies), peer support initiatives, and regular mental health check-ins. At the policy level, organizations should enforce mandatory mental health resources, create flexible staffing models to reduce burnout, and promote a culture of psychological safety that encourages open communication and emotional support. Additionally, enhancing resilience among nurses requires efforts to improve the working environment and the development of culturally appropriate support programs. When designing psychological interventions within Jordan's healthcare institutions, it is crucial to address the specific needs of nurses working in critical care settings.

Future studies should explore the factors that influence both positive and negative emotions in critical care nurses. Additionally, qualitative research could be conducted to investigate the resilience of nurses in these units.

Limitations of the study

This study had several limitations. First, the use of convenience sampling may limit the generalizability of the findings. Second, participants' responses were likely influenced by their thoughts and beliefs, and potential cultural or contextual factors may restrict the applicability of the results to other regions. Additionally, reliance on self-reported surveys introduces the risk of social desirability bias. The cross-sectional design further limits the ability to establish causal relationships. To address these issues, future research should consider longitudinal designs to more accurately assess psychological distress and resilience among critical care nurses over time.

Conclusions

The study found that critical care nurses experienced high levels of depression, anxiety, and stress, along with low levels of resilience, after the COVID-19 pandemic. A positive correlation was identified between resilience and marital status, while a negative relationship was found between resilience and anxiety. Based on these findings, healthcare institutions should focus on addressing the psychological challenges faced by critical care nurses to enhance their resilience, which in turn can improve their skills and ability to deliver high-quality care. Furthermore, experimental studies are needed to evaluate the effectiveness of intervention programs in enhancing resilience.

Abbreviations

DASS 42	Depression Anxiety Stress Scale
CD-RISC	Connor-Davidson Resilience Scale
SPSS	Statistical Package for Social Sciences

SD Standard deviations
VIF Variance Inflation Factor

Acknowledgements
Not applicable.

Author contributions
H.A. and M.M. designed the study and H.A. provided the data. All authors wrote the drafting of the manuscript. M.M. edited the manuscript and provided valuable comments. All authors reviewed and approved the manuscript.

Funding
The study was not funded.

Data availability
The data that support the findings of this study are not openly available due to reasons of sensitivity and are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
Approval was obtained in accordance with the Declaration of Helsinki from the Helsinki Committee in Palestine and the Institutional Review Board (IRB) of Al-Zaytooonah University of Jordan with reference number No #22/56 – 14/2021–2022, the Ministry of Health/Jordan with reference NO# MOH/REC/2022/201; and King Abdullah Hospital with reference NO # 13/2/1318). Participants provided informed written consent. Confidentiality of the data was maintained throughout data collection and analysis.'

Consent for publication
Not Applicable.

Competing interests
The authors declare no competing interests.

Received: 7 April 2025 / Accepted: 29 May 2025
Published online: 01 July 2025

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