BMC Nursing

RESEARCH

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The mediating effect of resilience and job satisfaction on the relationship between critical care nurses' stress-and task performance: findings to improve nursing care

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Abstract

Background Critical care nurses (CCNs) are exposed to stress, which may affect their performance. Resilience and job satisfaction are important factors in improving adaptation and work performance.

Aims This study aimed to ascertain the mediating effect of resilience and job satisfaction on the relationship between critical care nurses' stressand task performance among CCNs in Hail City, Saudi Arabia.

Methods A cross-sectional correlational design was used in critical and intensive care units in all governmental hospitals in Hail City, Saudi Arabia, from March to May 2024 for the 352 CCNs using a convenience sample selection method. Data were collected using the Global Satisfaction Scale, the Brief Nursing Stress Scale, the Task Performance Scale, and the Brief Resilience Scale. Multiple linear regression was used to identify key variables affecting nurses' task performance and job satisfaction. Path analysis was performed using AMOS 23.0, to ascertain the direct and indirect impacts of CCNs' task performance.

Results The results indicated that those who were non-Saudi, held bachelor's degrees, were registered nurses or supervisors, had less stress, and had more resilience were significant factors of higher task performance scores, whereas irregular shift duration was a factor of lower task performance scores ($p < .05$). Stress had an indirect negative impact on task performance through resilience and job satisfaction (β=-0.052, $p < .001$ and β=-0.115, $p < .001$, respectively). Furthermore, stress had a significant negative direct effect on task performance (β=-280, $p < .001$), with a total effect of (β=-0.447, $p < .001$).

Conclusion Nurses' stress, resilience, job satisfaction, and task performance were intertwined with critical care nursing. Strategies are needed to implement effective programs for improving nurse resilience and well-being

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satisfaction, and to examine the multifaceted elements that impact nursing work in the harsh nursing critical care environment.

Nursing implications The results highlight the importance of organizational support, such as training and resources for resilience building, in alleviating stress and enhancing critical care nurses' overall satisfaction and performance.

Clinical trial number Not applicable.

Keywords Critical care nurses, Resilience, Stress, Job satisfaction, Performance

Introduction

Nursing constitutes the fundamental basis of healthcare systems, acting as the initial interface between patients and delivery of healthcare services [1]. Nursing performance in critical care has a direct effect on patient safety, which needs to be monitored continuously [2, 3]. Nursing performance is a collection of actions that nurses engage in to promote the health and recovery of the patients they are responsible for [4]. The nursing profession faces high levels of stress, which significantly affects well-being. Nurses encounter high occupational stress levels because of various factors, including excess workplace demands that exceed available resources and nurses' abilities, which in turn contributes to emotional and physical burden [5, 6]. Previous studies revealed high levels of stress among critical care nurses (CCNs), ranging from 69.5 to 71% [7, 8]. Prolonged stress levels contribute to burnout development, which leads to diminished physical well-being and poor self-appreciation among nurses [9]. Increased stress levels among nurses in critical care units negatively impact their productivity and overall wellbeing. Increased stress levels are associated with psychological problems including anxiety, depression [2], and burnout [9]. Babapour et al. [10] found that a high level of job stress among nurses significantly affected their quality of life and performance. However, several factors such as resilience and job satisfaction can alleviate stress and ultimately improve nursing performance.

Resilience is an important concept that helps individuals deal with stressful situations in their workplace and prevents emergencies and psychosocial problems [11]. Resilience among nurses involves their ability to effectively adapt to stressful workplace conditions [12]. Resilience is essential in aligning individual nurse characteristics to achieve optimal well-being and functioning [13]. Nurses in critical care settings face stressors from patients, family members, relationships with other staff members, and the workplace. When such stressors accumulate, they lead to adverse outcomes among nurses, such as low physical and psychological well-being; thus, resilience provides nurses with better adaptation to such stress [14].

Understanding the levels of resilience among critical care nurses (CCNs) is imperative for identifying the factors affecting them in the workplace, enhancing the availability of job resources, and helping them realize personal and professional growth [15]. The significance of resilience among nurses in critical care units is established in reducing stress levels and improving work engagement and functioning in the presence of stressors [16]. Resilience is important for critical care nurses as it helps them develop better ways of dealing with increasing job demands and stressors [15]. CCNs' resilience can be enhanced through the provision of social support, job satisfaction, and improvements in their general well-being [16]. Resilience had a negative impact on nursing stress and a positive impact on nursing performance. A significant negative correlation was found between stress and resilience of CCNs [17]. Another recent study conducted by Shen et al. (2024) [18] revealed that resilience had a positive effect on improving performance among Chinese nurses. Job satisfaction is another factor that can affect nursing performance and improve productivity. Job satisfaction is an important healthcare concept and is described as a comparison between an individual's expectations and real experiences [19].

Job satisfaction is correlated with an individual's emotions related to their job. According to Kalinowska and Marcinowicz, 2020 [20], job satisfaction is "a pleasant or positive emotional state resulting from the assessment of our work or the experience associated with work." Job satisfaction is an imperative determinant of positive nursing and patient outcomes. It reduces nurses' stress and intent to leave work, while enhancing their commitment and performance [1]. Job satisfaction entails an individual's emotional response to his or her job as determined by individual experience, and job appraisal is associated with various factors and dimensions. It involves positive feelings about one's occupation [21] and determines individuals' attitudes toward their profession [22].

Job satisfaction is an important organizational aspect, particularly in healthcare settings. It is associated with turnover intention, absenteeism, efficiency, performance, psychological problems, and burnout [23]. Job satisfaction is based on individual psychosocial characteristics and their adaptation to the workplace environment. This is a criterion for estimating the performance of nurses [24]. Nurses are crucial in healthcare provision; thus, their job satisfaction levels are critical to the quality of the nursing care provided. Job satisfaction among nurses

is an important consideration, as satisfied nurses are more committed to their professional roles and responsibilities [25]. However, because of low job satisfaction, negative psychological issues are more likely to arise among nurses, such as stress and burnout, and reduce the efficiency of nurses in their workplace [26]. Additionally, the link between resilience and job satisfaction can be explained by their effectiveness in reducing nursing stress and improving performance. Shahrbabaki et al. [27] revealed the positive impact of resilience on job satisfaction among emergency nurses.

The nursing profession faces high levels of stress, which significantly affects well-being. Nurses encounter high occupational stress levels because of various factors, including excess workplace demands that exceed available resources and nurse ability, which in turn contribute to emotional and physical burden [5]. Prolonged stress levels contribute to burnout development, which leads to diminished physical well-being and poor self-appreciation among nurses [9]. Increased stress levels among nurses in critical care units negatively impact their productivity and overall wellbeing. Increased stress levels are associated with psychological problems such as anxiety, depression [2], and burnout [9].

Nurses practicing in critical care units face various challenges, including prolonged and repeated exposure to various stressful conditions and the factors that impact them [7]. Critical care nurses' work environment may affect their job satisfaction, resilience, and stress levels. Wang et al. 2022, revealed that resilience had a significant positive effect on job satisfaction and performance among healthcare workers [28]. Another study by Shen et al. 2024 found a positive relationship between resilience and work performance among nurses in China [18]. To the best of our knowledge, no previous study has been conducted in Saudi Arabia. This study aimed to ascertain the mediating effect of resilience and job satisfaction on the relationship between and task performance among critical care nurses in Hail City, Saudi Arabia.

The contingency theory of work and performance and the job demands-resources model (JD-R) were used as theoretical and conceptual frameworks for guiding this study to understand the relationship between work stress, resilience, job satisfaction, and performance among nurses. Boyatzis proposed contingency theory in 1991, establishing that effective performance can be affected and improved through three main factors related to the individual, work, and organizational environment [29]. In addition, the job demands-resources model (JD-R) is an important framework for understanding the relationship between work stress and performance among nurses. This model considers that work resources, such as work stress, can negatively impact performance and are the best predictors of individual and organizational engagement and performance through a motivational process [30]. Additionally, it draws attention to the importance of employees' job resources, such as their positive assessment of or sense of control over their surroundings, which is positively correlated with engagement and performance and lessens the detrimental effects of work demands, such as stress. These theories and conceptual frameworks suggest that individual resources such as resilience and job satisfaction are important in mitigating the negative impact of stress and improving work performance. Therefore, the objective of this study was to evaluate the mediating role of resilience and job satisfaction in the relationship between stress and task performance among CCNs.

Accordingly, this study proposes the following hypotheses:

Hypothesis 1 There is a negative relationship between stress levels of CCNs and task performance.

Hypothesis 2 There is a negative relationship between stress levels of CCNs and job satisfaction.

Hypothesis 3 There is a negative relationship between CCNs' stress and resilience.

Hypothesis 4 There is a positive relationship between job satisfaction and task performance.

Hypothesis 5 There is a positive relationship between resilience and task performance.

Hypothesis 6 Resilience mediates the relationship between stress in the CCNs and nurses' task performance.

Hypothesis 7 Job satisfaction mediates the relationship between stress levels of CCNs and task performance.

Methods

Study design and setting

A cross-sectional correlational design was used for all CCNs (Saudi and non-Saudi nurses) in critical and intensive care units of all governmental hospitals in Hail City, Saudi Arabia, including King Salman Hospital, King Khaled Hospital, King Salman Hospital, Hail General Hospital, and Sharaf Hospital, each offering distinct healthcare services and special capacities. The King Salman Specialist Hospital, with a capacity of 500 beds, includes over 60 intensive care unit beds for adults and pediatrics, isolation rooms, and 28 beds in the emergency department. It is renowned for providing advanced medical services, such as burn care, endoscopy, physiotherapy, and both general and one-day surgeries. King Khalid Hospital, equipped with 300 beds, provides both

preventive and therapeutic healthcare needs and features 25 intensive care beds and 38 emergency beds. The hospital specializes in advanced diagnostic procedures and the management of accident-related injuries. Hail General Hospital, with a capacity of 225 beds, is known for its role in emergency and trauma care, housing 21 emergencies, and 11 intensive care beds. It also provides a wide range of services, including family medicine, maternity care, and preventive health care. Finally, Sharaf Hospital, a general healthcare facility, offers 125 beds, with 15 allocated for intensive adult care, 14 dedicated to intensive pediatric care, and 10 for the emergency department. It supports emergency and outpatient services, while aligning with national healthcare initiatives.

Participants and sampling method

A convenience sample of CCNs (Saudi and non-Saudi nurses) from March to May 2024 was used in this study. CCNs were excluded if their experience was less than one year or if they refused to participate. Based on the following standards, a sample size of 250 CCNs from 400 nurses in the intended critical and intensive care units was calculated using the OpenEpi web-based calculator, Version 3.01 (www.openepi.com): a 99% confidence level and 5% absolute precision. However, using a convenience sample method, the survey was distributed to all the CCNs who were in working (395); out of these, 352 replied (89.1% response rate), Fig. 1.

Data collection tools

The data were collected using a five-section questionnaire. The first section included nurses' demographic and practice-related characteristics, such as sex, age, nationality, marital status, job position, years of experience, level of qualification, working shift duration, nurse-to-patient ratio, shift hours, and other work. The second section was the Global Satisfaction Scale, developed by Warr et al. (1979) [31]. It contains 15 items used to assess job satisfaction among the CCNs. A seven-point Likert-type scale was used to score the following items: 7, I am extremely satisfied, 6 = I am very satisfied; 5, I am moderately satisfied, 4 = I am not sure, 3 = I am moderately dissatisfied; 2, I am very dissatisfied; and 1, I am extremely dissatisfied. The overall scores on the instrument ranged from 15 to 105, with high ratings indicating high satisfaction. The reliability of this tool was very good, with Cronbach's alpha ranging from 0.933 to.934 [31].

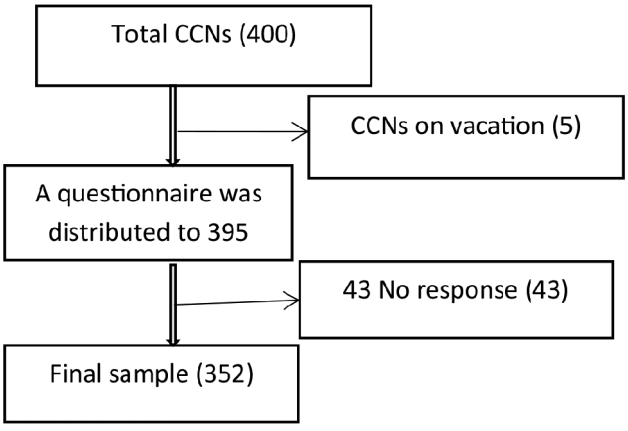

Fig. 1 Flowchart of participant recruitment

The third section was the Brief Nursing Stress Scale (BNSS), which was developed by Gray-Toft and Anderson in 1981 [32] to measure stress levels among CCNs. The BNSS is an instrument comprising six questions scored on a 4-point Likert scale (never = 1, sometimes = 2, frequently = 3, and almost always = 4. The overall scores on the instrument ranged from to 6–24, with high scores indicating high occupational stress levels [32]. A Cronbach's alpha coefficient of 0.96 demonstrated the instrument's reliability [33].

The fourth part was the Task Performance scale developed by Koopmans et al. 2012 [34]. This tool uses four items rated on a six-point Likert scale, ranging from 1 (never) to 6 (always). The reliability of this tool was confirmed with Cronbach's alpha ranging from 0.77 to 0.84 [35].

The fifth part is the Brief Resilience Scale (BRS), which was developed to evaluate an individual's ability to recover from stress [36]. The survey comprised six items with both positively and negatively worded questions (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree). The respondents evaluated their answers using a 5-point Likert scale. The total scale score ranged from 6 to 30 [36]. The reliability of this tool was good, with Cronbach's alpha ranging from 0.80 to 0.91 [36].

A pilot study was conducted among 35 CCNs to assess the viability and reliability of the questionnaire. The findings showed that the questionnaires took approximately 15 to 20 min to complete and were easy to understand. The reliability of the Global Satisfaction Scale, Brief Nursing Stress Scale (BNSS), Task Performance, and Brief Resilience Scale (BRS) in this study was Cronbach's alpha = 0.977, 0.849, 0.937, and 0.795, respectively. Data were collected using the English version of the questionnaire.

Data collection and ethical considerations

This study was approved by the Ethical Committee of the Research at Hail University (No: H-2024-095). The researchers recruited nurses after they were encouraged to participate by head nurses at the study hospitals. A researcher gave the nurses the questionnaires and informed consent papers during their breaks, after explaining the study's goal. The researcher waited in the

department head's office until all nurses had completed the questionnaires. It was made clear to all CCNs that their participation in the study was entirely voluntary and that they might withdraw at any moment for any reason. The participants signed a written informed consent form before participating. The privacy and confidentiality of the CCNs were protected by assigning each participant a code number during the data collection and analysis, and only aggregated data were shared.

Statistical analysis

IBM SPSS Statistics software, version 27 (IBM Corp., Armonk, NY, USA), was used to analyze the data. Participants' demographic and occupational data were generated using descriptive statistics including frequencies, percentages, averages, and standard deviations. According to the results of the Kolmogorov–Smirnov test, which was performed to determine if the distribution was normal, the data had a normal distribution (p-value > 0.05). The data were visually inspected for normality using skewness and kurtosis. The histogram also confirms the normality of the data distribution. Outliers were identified using histogram/density plots (i.e., displaying extreme numbers that were not consistent with the distribution of most of the data). Outliers were excluded if they were identified as mistakes or abnormalities unrelated to the study question. However, no outliers were detected in this study. To compare the mean scores of the research variables, one-way analysis of variance (ANOVA) or an independent samples t-test was employed, depending on the independent factors. Important variables influencing nurses' task performance and job satisfaction were identified using multiple linear regressions. Variance inflation factor (VIF) and tolerance were used to test for multicollinearity in the variables. The VIF values ranged from 1.18 to 2.05 and the tolerance values from 0.51 to 0.85, both of which were below the commonly recognized threshold of 5, indicating that there were no multicollinearity issues in the analysis [37]. Pearson's correlation coefficient was used to assess the correlations between the research variables. Path analysis was performed using AMOS 23.0 software to ascertain the mediating effect of resilience and job satisfaction on the relationship between CCNs' stress and task performance, using the bootstrap method (2000 replicates, 95% bias-corrected confidence interval). The adequacy of the measurement model is strongly supported by its goodness-of-fit indices. X2 = 1.878, df = 1.00, NFI = 0.992, RFI = 0.954, IFI = 0.996, TLI = 0.978, CFI = 0.996, RESMA = 0.050. Likewise, the mediation models showed acceptable model fit values [37, 38]. The direct, indirect, and total effects were statistically significant ($p < .05$), supporting the robustness of the mediation model [37, 38]. Significance was determined at a p-value < 0.05.

Results

Table 1 illustrates that the majority of CCNs were Saudi (64.2%), aged more than 35 years, with a mean age of 7.36 ± 1.12, had less than 5 years of experience (44.0%), had a bachelor's degree (79.0%), and a registered nurses (77.0%). In addition, Most of the CCNs had irregular schedules (52.65%), eight or fewer shift hours (77.5%), and did not have extra work (68.5%). There was a significant relationship between age and stress, resilience, job satisfaction, and task performance ($p < .05$). Younger nurses (≤ 25 years old) scored high on stress, whereas middle-aged (31–35 years) scored high on job satisfaction and task performance. Females scored significantly higher on task performance than males ($p < .001$). Saudi nurses scored higher on stress ($p = .001$) and lower on task performance than non-Saudi nurses ($p < .001$). Nurses with less experience scored higher on stress ($p = .019$), whereas those with more experience scored lower on satisfaction ($p = .017$). Nurses who held bachelor's degrees, registered nurses, and those in the regular morning shift scored significantly higher on task performance than the other groups ($p < .001$). Nurses who had fewer shift hours scored higher on satisfaction than those who had more shift hours ($p < .001$). In addition, nurses who had no extra work scored high on satisfaction ($p = .038$) and task performance ($p < .001$). Finally, nurses who had a desire to leave scored higher on levels of stress, low satisfaction, and task performance than others.

The study found that the model was significant for both task performance scores and satisfaction when demographic and work-related variables were subjected to multiple linear regression analysis ($P < .001$). This accounted for 45.9% (R2 = 0.459, adjusted R2 = 0.443) and 47.2% (R2 = 0.472, adjusted R2 = 0.447) of the variance in satisfaction and task performance, respectively (Table 2).

Compared to the reference categories, fewer shift hours, no intention to leave, less stress, and greater resilience were significant factors for higher satisfaction scores ($p < .05$). On the other hand, non-Saudi individuals who held bachelor's degrees, were registered nurses or supervisors, had less stress, and more resilience were significant factors of higher task performance scores, whereas irregular shift duration was a factor of lower task performance scores ($p < .05$) (Table 2).

Table 3 shows the correlations among the study variables. There was a significant negative correlation ($p < .001$) between stress and resilience, job satisfaction, and task performance (r=-.265, −0.497, and −0.447, respectively). However, positive correlations were found between resilience and job satisfaction ($r = .329$, $p < .001$), resilience and task performance ($r = .320$, $p < .001$), and job satisfaction and task performance ($r = .409$, $p < .001$). Table 3.

Table 1 Sociodemographic and work-related characteristics and their relationship with stress, resilience, job satisfaction, and task performance (*N* = 252)

Variables		*n*	%	Stress	Resilience	Job satisfaction	Task performance
Age[b]	7.36 ± 1.12						
	≤ 25	74	21.0	18.86 ± 5.19	19.14 ± 5.00	48.64 ± 11.28	13.14 ± 4.24
	26–30	92	26.1	15.06 ± 5.28	19.23 ± 3.95	53.25 ± 13.56	15.03 ± 4.34
	31–35	83	23.6	14.50 ± 4.32	19.06 ± 3.28	55.69 ± 11.62	15.92 ± 3.31
	> 35	103	29.3	16.88 ± 4.39	17.84 ± 3.15	48.44 ± 11.02	13.98 ± 3.92
	p-value			13.45(< 0.001)	2.84 (0.038)	7.74 (< 0.001)	7.53 (< 0.001)
Sex[a]							
	Male	172	48.9	16.26 ± 4.86	18.93 ± 4.15	50.59 ± 11.87	13.78 ± 4.25
	Female	180	51.1	16.26 ± 5.22	18.61 ± 3.59	52.27 ± 12.61	15.26 ± 3.79
	p-value			− 0.01 (0.993)	0.75 (0.449)	-1.28(0.201)	-3.44(< 0.001)
Nationality[a]							
	Saudi	226	64.2	16.91 ± 5.32	18.83 ± 4.33	50.85 ± 12.01	13.71 ± 4.35
	Non-Saudi	126	35.8	15.09 ± 4.28	18.65 ± 2.89	52.53 ± 12.67	16.01 ± 3.04
	p-value			3.29 (0.001)	0.40(0.689)	-1.231(0.219)	-5.247(< 0.001)
Marital status[b]							
	Single	169	48.0	16.34 ± 5.66	18.83 ± 4.24	52.49 ± 13.40	14.98 ± 4.32
	Married	166	47.2	16.32 ± 4.51	18.78 ± 3.45	50.42 ± 11.11	14.15 ± 3.79
	Divorce	17	4.8	14.82 ± 3.02	17.94 ± 4.03	51.23 ± 10.88	13.88 ± 4.16
	p-value			0.72(0.484)	0.41(0.662)	1.19(0.304)	2.00(0.137)
Experience in years[b]							
	< 5	155	44.0	17.00 ± 5.46	18.98 ± 4.45	50.90 ± 12.66	14.22 ± 4.39
	5–10	128	36.4	15.32 ± 5.22	18.82 ± 3.64	53.64 ± 12.10	14.78 ± 4.08
	> 10	69	19.6	16.34 ± 3.15	18.17 ± 2.70	48.62 ± 11.04	14.79 ± 3.30
	p-value			3.99(0.019)	1.07(0.343)	4.11(0.017)	0.81(0.443)
Qualification[b]							
	Diploma	38	10.8	15.68 ± 3.88	19.18 ± 4.69	47.73 ± 9.67	12.05 ± 4.15
	Bachelor	278	79.0	16.34 ± 5.19	18.86 ± 3.75	51.93 ± 12.57	15.12 ± 3.79
	Master	36	10.2	16.22 ± 5.03	17.61 ± 3.74	51.63 ± 11.94	12.66 ± 4.70
	p-value			0.29 (0.748)	1.91(0.149)	1.97 (0.140)	14.70(< 0.001)
Position[b]							
	Assistant nurse	44	12.5	16.65 ± 3.80	18.93 ± 4.06	48.95 ± 9.10	12.04 ± 3.74
	Registered nurse	271	77.0	16.08 ± 5.16	18.74 ± 3.85	51.73 ± 12.91	14.91 ± 4.01
	Head Nurse, Supervisor	37	10.5	17.13 ± 5.45	18.78 ± 3.90	52.35 ± 10.39	14.78 ± 4.06
	p-value			0.86(0.443)	0.04(0.995)	1.08(0.339)	9.85(< 0.001)
Shift duration[b]							
	Regular morning shift	70	19.9	15.40 ± 5.10	19.48 ± 4.03	54.50 ± 12.25	15.52 ± 3.57
	Regular night shift	97	27.6	16.20 ± 4.41	18.61 ± 3.81	50.41 ± 9.43	14.32 ± 4.49
	Irregular schedule	185	52.6	16.62 ± 5.31	18.57 ± 3.83	50.84 ± 13.41	12.81 ± 4.14
	p-value			1.50(0.224)	1.49(0.225)	2.76 (0.065)	15.24(< 0.001)
Shift hours[a]							
	8 or less	273	77.5	16.06 ± 5.25	18.81 ± 3.93	52.63 ± 12.41	14.60 ± 4.27
	more than 8	79	22.5	16.96 ± 4.18	18.62 ± 3.68	47.37 ± 10.88	14.31 ± 3.39
	p-value			-1.39(0.163)	0.38(0.697)	3.40(< 0.001)	0.55(0.589)
Extra work[a]							
	Yes	111	31.5	16.81 ± 4.84	18.57 ± 4.34	49.45 ± 9.61	13.02 ± 4.07
	No	241	68.5	16.01 ± 5.12	18.85 ± 3.64	52.37 ± 13.22	15.23 ± 3.90
	p-value			1.38(0.168)	− 0.63(0.526)	-2.08(0.038)	-4.86(< 0.001)
Intention to leave[b]							
	Strongly Disagree	44	12.5	14.89 ± 4.90	19.02 ± 3.43	58.18 ± 12.31	16.11 ± 4.18
	Disagree	74	21.0	15.74 ± 4.49	18.97 ± 3.95	54.24 ± 13.06	15.44 ± 4.11
	Neutral	141	40.1	16.11 ± 5.79	18.54 ± 3.41	50.75 ± 11.57	14.48 ± 4.01
	Agree	64	18.2	17.75 ± 6.17	18.43 ± 4.36	51.13 ± 11.82	12.92 ± 3.70

Table 1 (continued)

Variables		*n*	%	Stress	Resilience	Job satisfaction	Task performance
	Strongly agree	29	8.2	18.42 ± 4.53	19.68 ± 5.17	45.29 ± 9.82	13.65 ± 3.72
	p-value			5.59(< 0.001)	0.73(0.566)	9.20(< 0.001)	5.68(< 0.001)

[a]Independent sample t-test; [b] ANOVA test

Table 2 Multiple linear regression of factors affecting nurses' job satisfaction and task performance

Factors	Categories	Job satisfaction			Task performance		
		β	95% CI for β	*p*-value	β	95% CI for β	*p*-value
Age	7.36 ± 1.12	− 0.023	− 0.262-0.216	0.852	− 0.027	− 0.087-0.033	0.376
Sex							
	Male				Reference		
	Female				− 0.251	-1.204-0.702	0.604
Nationality							
	Saudi						
	Non-Saudi				2.088	1.052–3.124	0.011
Experience in years		− 0.194	− 0.562-0.173	0.299			
Qualification							
	Diploma	-	-	-	Reference		
	Bachelor				1.622	0.258-2.987	0.001
	Master				0.036	-1.790-1.862	0.969
Position							
	Assistant nurse				Reference		
	Registered nurse				1.084	− 0.150-2.318	0.046
	Head Nurse, Supervisor				1.684	− 0.041-3.410	0.006
Shift duration							
	Regular morning shift				Reference		
	Regular night shift				− 0.066	0.457-2.815	0.916
	Irregular schedule				1.636	-1.283-1.152	0.007
Shift hours		− 0.534	-1.043–0.024	0.022			
Extra work							
	Yes	Reference			Reference		
	No	1.856	− 0.936-4.649	0.192	0.674	− 0.259-1.607	0.156
Intention to leave							
	Strongly Disagree	Reference			Reference		
	Disagree	-4.575	-8.972–0.177	0.041	− 0.744	-2.158-0.669	0.301
	Neutral	-7.015	-11.025–3.006	0.001	-2.145	-3.487–0.803	0.002
	Agree	-12.776	-17.298–8.254	< 0.001	-2.248	-3.698–0.798	0.002
	Strongly agree	-7.402	-12.955–1.850	0.009	-1.815	-3.554–0.077	0.041
Stress		-1.294	-1.499–1.089	< 0.001	− 0.314	− 0.384–0.244	< 0.001
Resilience		0.510	0.249-0.772	< 0.001	0.208	0.120-0.295	< 0.001

*R2 = 0.459, Adjusted R2 = 0.443, $p < .001$; **R2 = 0.472, Adjusted R2 = 0.447, $p < .001$; β, standardized beta; CI, confidence interval; *Significant level < 0.05

The analysis of the effect of resilience and job satisfaction on the relationship between stress and task performance

A structural equation model was developed using AMOS 24.0, with stress as the independent variable, task performance as the dependent variable, and job satisfaction and resilience as parallel mediating variables. Figure 2 depicts the model of how resilience and job satisfaction mediate the relationship between stress and task performance. According to the model, stress had an indirect negative impact on task performance through resilience and job satisfaction (β=-0.052, $p < .001$ and β=-0.115, $p < .001$, respectively). Furthermore, stress had a significant negative direct effect on task performance (β=-280, $p < .001$), with a total effect of (β=-0.447, $p < .001$). Stress also had a significant direct effect on resilience and job satisfaction (β= − 0.265, $p < .001$ and β=-0.497, $p < .001$, respectively). Finally, resilience and job satisfaction had significant positive direct effects on task performance (β = 0.202, $p = .001$ and β = 0.232, $p = .001$, respectively) (Table 4). The adequacy of the measurement model is strongly supported by its goodness-of-fit indices. X2 = 1.878, df = 1.00, NFI = 0.992, RFI = 0.954, IFI = 0.996, TLI = 0.978, CFI = 0.996, RESMA = 0.050.

Table 3 Correlation between nurses' stress, resilience, job satisfaction, and task performance

Variables		Stress	Resilience	Job satisfaction	Task performance
Stress	r	1			
	p				
Resilience	r	−0.265**	1		
	p	< 0.001			
Job satisfaction	r	−0.497**	0.329**	1	
	p	< 0.001	< 0.001		
Task Performance	r	−0.447**	0.320**	0.409**	1
	p	< 0.001	< 0.001	< 0.001	

**Correlation is significant at the 0.01 level (2-tailed)

Table 4 Path analysis of resilience and job satisfaction on the relationship between stress and task performance

Path	Effect size	CI (95%)	*P*-value
Indirect Effect			
Stress → Job satisfaction → Task performance	−0.115	−0.151–0.049	< 0.001
Stress → Resilience → Task performance	−0.052	−0.076–0.022	< 0.001
Direct effect			
Stress → Job satisfaction	−0.497	−0.588–0.396	0.001
Stress → Resilience	−0.265	−0.364–0.157	< 0.001
Stress → Task performance	−0.280	−0.395–0.163	< 0.001
Job satisfaction → Task performance	0.232	0.127-0.335	0.001
Resilience → Task performance	0.202	0.113-0.302	0.001
Total Effect			
Stress → Task performance	−0.447	−0.525–0.365	< 0.001

CI, confidence interval

Discussion

Sociodemographic and work-related characteristics and their relationship with stress, resilience, job satisfaction, and task performance

This study aimed to assess how resilience and job satisfaction affect the relationship between stress and task performance among critical care nurses (CCNs) working in Hail City, Saudi Arabia. In this study, we found relationships between age, stress, resilience, job satisfaction, and task performance. It has been established that younger nurses experience more stress, whereas the middle-aged reported high job satisfaction and task performance levels. This is in line with other studies that indicate that age influences stress and job satisfaction in the healthcare workforce, especially among younger nurses, who are most stressed because they lack adequate experience [16]. For instance, female nurses performed significantly better on tasks than male nurses. This is consistent with findings that suggest that the majority of female nurses are more active in their primary duties, probably as a result of socialization, which emphasizes caregiving and responsibility [16]. In the current study, Saudi nurses' stress levels were higher, while their task performance was lower, relative to their non-Saudi counterparts. This

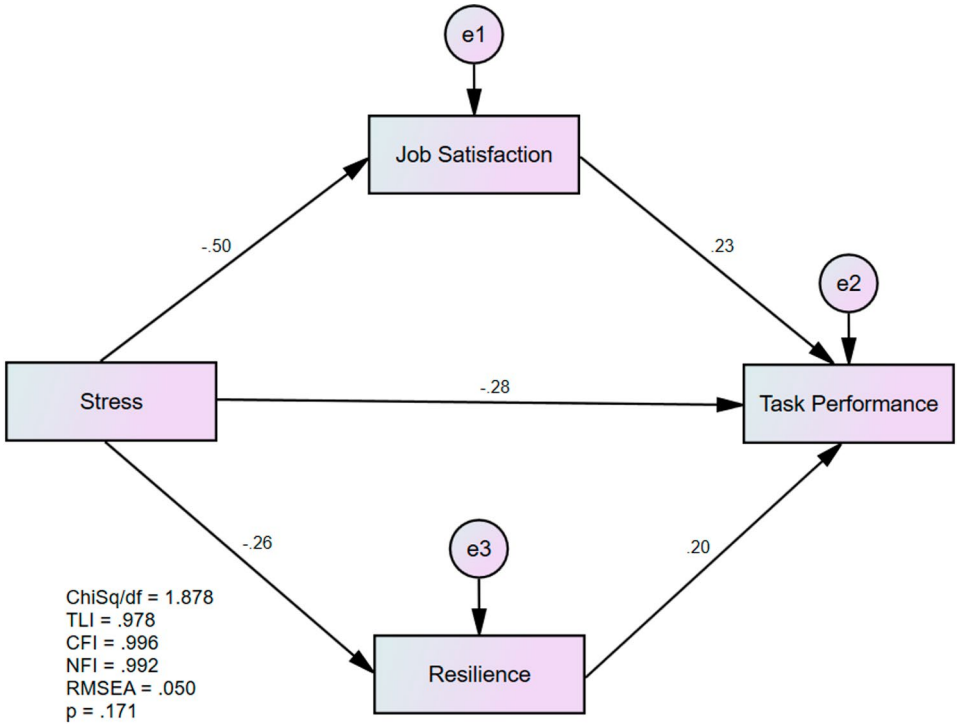

Fig. 2 Model of the mediating effect of Resilience and job satisfaction on the relationship between stress and task performance

discrepancy might, in part, be attributed to the interplay between culturally specific communication styles and rigid organizational hierarchies in the Saudi healthcare system. More specifically, cultural frameworks that favor submission to authority, which may be indicative of higher power distance scores, could be combined with Saudi nurses having no autonomy within rigid hierarchies. These factors could limit nurses' decision-making freedom, which restricts their ability to address concerns related to workload and available resources, and consequently amplifies stress while also diminishing job satisfaction and task performance. Saudi nurses' control over their work indicates autonomy, which could further influence the power dynamics and stress relationships and warrant exploration, as suggested by subsequent research examining the interdependencies of organizational power distance, perceived hierarchy, control, and stress performance outcomes based on nationality. Such a gap might reflect facets of culture and the system that influences the working conditions of Saudi nurses, which has already been highlighted in previous studies on the cultural context of nursing [39].

As much as nurses' experiences of working in the past affected them, those who had less work experience tended to report more cases of stress, while those who had more experience tended to report less satisfaction with their job [40]. Moreover, the level of education attained was also a factor in productivity, with bachelor's degree nurses and professional registered nurses doing much more on regular morning shifts. This analysis correlates with studies that assert that as the level of education in nursing increases, so does the expected level of performance [41]. This study also established an inverse relationship between the number of hours worked and the overall job satisfaction. As work hours increased, job satisfaction also decreased. This finding supports prior research that underscores the importance of integrating one's professional and personal lives to enhance the satisfaction levels of healthcare workers [42]. Nurses without secondary jobs expressed higher satisfaction and performance levels, suggesting that satisfaction and performance can be achieved with optimal work responsibility allocation [43]. Finally, it was found that the most stressed individuals with lower levels of satisfaction and performance were those wishing to exit the profession, thereby highlighting the need for retention strategies that address stress and dissatisfaction factors among nurses [28].

Mediating effect of resilience and job satisfaction on the relationship between stress and task performance

Mediation analysis indicated that regulation of stress, nurses' satisfaction, and job performance can at best be achieved when resilience is fostered. Nurses working in critical care settings experience burnout, which reduces job satisfaction and increases turnover [23]. Moreover, the adverse effects of burnout on job satisfaction, particularly emphasizing that critical care nurses endure high levels of psychosocial stress and highlight the need to implement strategic frameworks that enhance resilience and reduce emotional exhaustion [11]. Conversely, increased levels of resilience lead to decreased burnout and heightened performance and satisfaction among critical care nurses, which acts as a protective mechanism to sustain well-being [18]. Moreover, persistent systematic support from nurse leaders improves the quality of care and significantly retains nurses [44]. Moreover, nurses demonstrating greater levels of resilience perform better in stress management and problem solving, both critical skills in high-stress areas such as critical care [11]. Commitment to the organization also relates closely to resilience, whereby greater perceived organizational support is associated with higher resilience and, therefore, job satisfaction and retention intentions among nurses [45]. Thus, building a culture of resilience at work can be an organizational approach to alleviate psychological strain and enhance overall participation among nursing staff.

These results remain crucial for developing organizational policies and managing nursing departments. Mediation analysis indicated that regulation of stress, nurses' satisfaction, and job performance can at best be achieved when resilience is fostered. These changes can be in the form of resilience-enhancing interventions such as training and increased support for CCN, which can result in increased job satisfaction and performance [15, 18]. Additionally, more mentorship and supportive measures directed towards younger, less experienced nurses can help nurses manage stress better and improve their level of satisfaction with their work [46]. From this perspective, the investigation describes the phenomena of stress and resilience, together with job satisfaction and task performance among CCNs in the city of Ha'il. These findings emphasize the role of resilience as a mediating factor in the relationship between stress and various facets of CCNs' well-being, performance, and productivity under stressful conditions.

Factors affecting nurses' job satisfaction and task performance

Multiple linear regression analysis revealed that demographic and work-related variables had a major impact on the satisfaction and task performance scores. These findings indicate that the interplay between stress, resilience, demographic factors, and other variables is fundamental to understanding the job satisfaction and performance. Predictive analysis suggested that lower shift hours, absence of intention to quit, lower stress levels, and greater resilience were important factors associated with

high satisfaction at work. These outcomes are consistent with the findings of other studies, which have noted that satisfactory working conditions and reasonable work hours increase nurses' job satisfaction [47, 48]. It could be noted that resilience served as a mediator in the relationship between personal strength use and job satisfaction. In other words, resilience can enhance job satisfaction through its enhancement (Bai, 2023). Furthermore, researchers have found a positive correlation between resilience and job satisfaction, which supports the notion that nurses with greater levels of resilience have greater job satisfaction [48].

Similarly, Irregular shift performance is associated with lower task performance. However, Cooper et al. (2020) [49] emphasized that resilience as a protective factor offers positive job outcomes, as it allows nurses to cope effectively with stress. Resilience can also moderate the association between job burnout and psychological stress, which may eventually impact workplace performance [50]. These findings should be considered when devising policies at the organizational and nursing management levels. For CCNs, enhancing resilience is likely to improve performance during stressful situations given the mediating role of resilience in the relationship between stress and task performance. Purposeful resilience-building interventions, such as training and supportive resources, could lessen the effects of stress on performance [51]. Equally important, the mediating role of job satisfaction suggests that supportive organizational policies that raise job satisfaction can improve task performance [21]. The findings of this study point to the multifaceted nature of the relationships between stress, resilience, job satisfaction, and task performance for CCNs. Given these findings, resilience and job satisfaction must be acknowledged as crucial intermediaries in the association between stress and performance, particularly in high-stress settings, such as nursing staff, where increasing well-being and performance can make a difference at greater levels.

Correlation between nurses' stress, resilience, job satisfaction, and task performance

The study of the relationships between stress, resilience, satisfaction with work, and performance of duties of CCNs provides important information about these variables. The analysis yielded highly valid negative correlations between stress and resilience, stress and job satisfaction, and stress and performance on various tasks. These findings corroborate other research showing that stress negatively affects job satisfaction and performance in the healthcare industry. For example, research discovered that higher distress among nurses greatly lowers their satisfaction with the job while increasing their desire to quit [52]. Similarly, nurses exposed to high stress levels also reported low job satisfaction and greater willingness to abandon their posts [53]. This finding highlights the importance of reducing stress in the nursing environment. In contrast, the findings showed other positive relationships such as resilience, job satisfaction, resilience, task performance, job satisfaction, and task performance. Resilience and task performance optimally complement satisfaction as indicated by reliability. Together, these results indicate that building resilience and maintaining job satisfaction reduces the adverse consequences of stress, thus improving task performance. These results have several important implications. The inverse relationship between stress and other variables shows that healthcare organizations need to take action through stress management and resilience training programs for CCNs. Such measures may increase nurses' well-being and job satisfaction, which can improve their performance [25]. Additionally, positive relationship stress increases supportive work environments, which foster resilience and job satisfaction. This will allow not only alleviation of stress, but also enhancement of performance and retention of nursing personnel [50]. As such, the current findings are in accordance with the previous literature and further highlight the continuing critical connectedness among stress, resilience, job satisfaction, and task performance of CCNs. Addressing these key components enables sustained improvement in the work environment and professional nursing health outcomes.

Implications for nursing

This study makes an important contribution to the field of nursing practice and research. Regarding practical aspects, the results highlight the importance of organizational support, such as training and resources for resilience building, in alleviating stress and enhancing the overall satisfaction and performance of critical care nurses. At the novice level, mentorship schemes are important to stress and job satisfaction. Nursing administrators should prioritize implementing specific solutions to mitigate workload problems, such as the adoption of optimized scheduling practices that incorporate flexible shift options. As such, the strategic redistribution of tasks is based on patient acuity and staff skill mix and the provision of adequate support staff to handle non-nursing duties, thereby directly addressing the issue of excessive working hours. In terms of nursing research, this study set the stage for further exploration of the intricate links among stress, resilience, job satisfaction, and performance. Longitudinal studies are needed to confirm these findings. Qualitative research on nurses' narratives is therefore important. More importantly, the issue of developing and evaluating interventions for resilience and their additional mediating or moderating variables remains to be studied. The patient population and

nursing workforce demographic characteristics require more specific and tailored approaches. For instance, due to the aging nursing workforce, organizations should develop mentorship programs whereby seasoned and early career nurses are paired to enhance knowledge transfer and career development. Cross-cultural research may help to understand the role of the cultural context. These approaches have great potential to advance evidence-based approaches that foster nurses' well-being and maximize their critical care nursing performance.

Study limitations

This study has some limitations. First, its cross-sectional design precludes any attempt to establish causal links such as whether resilience produces changes in job satisfaction. Second, self-report instruments are prone to response biases such as social desirability bias, which can distort outcomes. Third, the sample was restricted to critical care nurses within Hail City, Saudi Arabia, which may not be representative of other nurse cohorts or healthcare settings, and the unique culture may make generalization even more challenging. While the results of the model indicated a significant proportion of variance in job satisfaction and task performance, other factors such as styles of leadership, which are more likely to exert influence, were left unexplained. Although this study strongly supports resilience as a mediating factor, it does not eliminate the existence of other mediating or moderating factors that influence the relationship between stress, job satisfaction, and task performance. Finally, the study focused on critical care nurses without attempting to identify or analyze methods to foster resilience, thus restricting practical suggestions to healthcare institutions.

Conclusion

Nurses' stress, resilience, job satisfaction, and task performance are intertwined with those of critical care nursing. Younger nurses with less experience face catastrophic job burnout. Moreover, nurses with less experience are particularly susceptible to burnout, considering their productivity and factors, such as workload, shifts, and intention to leave the profession. It is clear that the problem of nursing greatly emphasizes the need for programs designed to build nurse job resilience, mentorship programs, and the framework of the working environment. The results of this study will motivate future research to determine effective programs for improving nurses' well-being and to examine the multifaceted elements that impact nursing work in the harsh environment of nursing critical care. Healthcare organizations focus on improving nurses' well-being to improve retention rates, while fostering an environment that supports nurses.

Abbreviations

CCNs	Critical care nurses
BNSS	Brief Nursing Stress Scale
SPSS	Statistical Package for the Social Sciences
SD	Standard Deviation

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12912-025-03225-3.

Supplementary Material 1

Acknowledgements

We appreciate the assistance of the Scientific Research Deanship of Saudi Arabian University of Ha'il. We would also like to thank all CCN staff members who participated in this study.

Author contributions

S.A.A. designed the study. S.A.A, O.A.A, H.A, AA, A.O.L, G.F.A, S.H.A, A.Z.A, conducted the survey and collected data; S.A.A. analyzed the data; S.A.A. and E.P. interpreted the results; S.A.A, O.A.A, H.A, AA, A.O.L, G.F.A, S.H.A, E.P, A.Z.A,. wrote the first draft. All authors have contributed to the revision of the manuscript. All authors have read and approved the final manuscript.

Funding

This research was funded by the Scientific Research Deanship at the University of Ha'il, Saudi Arabia, through project number << RG-24 181>>.

Data availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

This study was approved by the Research Ethics Committee of the University of Ha' il (Ethical Approval No: H-2024-095) and all procedures were performed in accordance with the Declaration of Helsinki. It was made clear to all CCNs that their participation in the study was entirely voluntary and that they might withdraw at any moment for any reason. The participants signed a written informed consent form before participation. The privacy and confidentiality of the CCNs were protected by assigning each participant a code number during the data collection and analysis, and only aggregated data were shared.

Consent for publication

No applicable.

Competing interests

The authors declare no competing interests.

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Received: 9 March 2025 / Accepted: 16 May 2025
Published online: 22 May 2025

References

1. Alzoubi MM, Al-Mugheed K, Oweidat I, Alrahbeni T, Alnaeem MM, Alabdullah AAS, Abdelaliem SMF, Hendy A. Moderating role of relationships between workloads, job burnout, turnover intention, and healthcare quality among nurses. BMC Psychol. 2024;12(1):495.
2. Alkubati SA, Alsaqri SH, Alrubaiee GG, Almoliky MA, Al-Qalah T, Pasay-an E, Almeaibed H, Elsayed SM. The influence of anxiety and depression on critical care nurses' performance: A multicenter correlational study. Australian Crit Care. 2025;38(1):101064.
3. Ahmed FR, Khaiwa L, Mustafaalsaafin H, Aldraimli HIF, Imran TGT, Al-Yateem N, Ahmad A, Hammash M, Subu MA, Mottershead R, Aburuz ME. Multicultural nursing team in ICU: intraprofessional collaboration and job performance. Nurs Forum. 2025;2025(1):2541827.
4. Sagherian K, Steege LM, Geiger-Brown J, Harrington D. The nursing performance instrument: exploratory and confirmatory factor analyses in registered nurses. J Nurs Res. 2018;26(2):130–7.
5. Alkhawaldeh JMA, Soh KL, Mukhtar FBM, Peng OC, Anshasi HA. Stress management interventions for intensive and critical care nurses: A systematic review. Nurs Crit Care. 2020;25(2):84–92.
6. Alshammari B, Alanazi NF, Kreedi F, Alshammari F, Alkubati SA, Alrasheeday A, Madkhali N, Alshara A, Bakthavatchaalam V, Al-Masaeed M, et al. Exposure to secondary traumatic stress and its related factors among emergency nurses in Saudi Arabia: a mixed method study. BMC Nurs. 2024;23(1):337.
7. Salameh B, Abdallah J, Alkubati SA, Albashtawy M. Alarm fatigue and perceived stress among critical care nurses in the intensive care units: Palestinian perspectives. BMC Nurs. 2024;23(1):261.
8. Vahedian-Azimi A, Hajiesmaeili M, Kangasniemi M, Fornés-Vives J, Hunsucker RL, Rahimibashar F, Pourhoseingholi MA, Farrokhvar L, Miller AC. Effects of stress on critical care nurses: A National Cross-Sectional study. J Intensive Care Med. 2019;34(4):311–22.
9. Cha YJ, Lee KS, Cho JH, Choi IS, Lee D. Effect of job stress on burnout among nurses responding to COVID-19: the mediating effect of resilience. Int J Environ Res Public Health. 2022:19(9).
10. Babapour AR, Gahassab-Mozaffari N, Fathnezhad-Kazemi A. Nurses' job stress and its impact on quality of life and caring behaviors: a cross-sectional study. BMC Nurs. 2022;21(1):75.
11. Sacgaca L, Gonzales A, Alkubati S, Alrashidi N, Alreshidi MS, Pasay-an E, Hernandez JP, Alboliteeh M, Ramadan MY, Al Onezei AK et al. The Impact of Mental Well-Being, Stress, and Coping Strategies on Resilience among Staff Nurses during COVID-19 in Saudi Arabia: A Structural Equational Model. Healthcare. 2023;11(3):368.
12. Durmuş A, Ünal Ö, Türktemiz H, Öztürk YE. The effect of nurses' perceived workplace incivility on their presenteeism and turnover intention: the mediating role of work stress and psychological resilience. Int Nurs Rev. 2024;71(4):960–8.
13. Kim EY, Chang SO. Exploring nurse perceptions and experiences of resilience: a meta-synthesis study. BMC Nurs. 2022;21(1):26.
14. Foster K, Roche M, Delgado C, Cuzzillo C, Giandinoto JA, Furness T. Resilience and mental health nursing: an integrative review of international literature. Int J Ment Health Nurs. 2019;28(1):71–85.
15. Liu S, Zhang Y, Liu Y, Han P, Zhuang Y, Jiang J. The resilience of emergency and critical care nurses: a qualitative systematic review and meta-synthesis. Front Psychol. 2023;14:1226703.
16. Öksüz E, Demiralp M, Mersin S, Tüzer H, Aksu M, Sarıkoc G. Resilience in nurses in terms of perceived social support, job satisfaction and certain variables. J Nurs Manag. 2019;27(2):423–32.
17. Aqtam I, Ayed A, Toqan D, Salameh B, Abd Elhay ES, Zaben K, Mohammad Shouli M. The relationship between stress and resilience of nurses in intensive care units during the COVID-19 pandemic. INQUIRY. 2023;60:00469580231179876.
18. Shen ZM, Wang YY, Cai YM, Li AQ, Zhang YX, Chen HJ, Jiang YY, Tan J. Thriving at work as a mediator of the relationship between psychological resilience and the work performance of clinical nurses. BMC Nurs. 2024;23(1):194.
19. El Mouaddib H, Sebbani M, Mansouri A, Adarmouch L, Amine M. Job satisfaction of primary healthcare professionals (public sector): A cross-sectional study in Morocco. Heliyon. 2023;9(9):e20357.
20. Kalinowska P, Marcinowicz L. Job satisfaction among family nurses in Poland: A questionnaire-based study. Nurs Open. 2020;7(6):1680–90.
21. Memon AH, Khahro SH, Memon NA, Memon ZA, Mustafa A. Relationship between job satisfaction and employee performance in the construction industry of Pakistan. Sustainability. 2023;15(11):8699.
22. Nurjanah S, Pebianti V, Handaru AW. The influence of transformational leadership, job satisfaction, and organizational commitments on organizational citizenship behavior (OCB) in the inspectorate general of the ministry of education and culture. Cogent Bus Manage. 2020;7(1):1793521.
23. Heidari S, Parizad N, Goli R, Mam-Qaderi M, Hassanpour A. Job satisfaction and its relationship with burnout among nurses working in COVID-19 wards: A descriptive correlational study. Ann Med Surg (Lond). 2022;82:104591.
24. Lu H, Zhao Y, While A. Job satisfaction among hospital nurses: A literature review. Int J Nurs Stud. 2019;94:21–31.
25. Kallerhult Hermansson S, Norström F, Hilli Y, Rennemo Vaag J, Bölenius K. Job satisfaction, professional competence, and self-efficacy: a multicenter cross-sectional study among registered nurses in Sweden and Norway. BMC Health Serv Res. 2024;24(1):734.
26. White EM, Aiken LH, Sloane DM, McHugh MD. Nursing home work environment, care quality, registered nurse burnout and job dissatisfaction. Geriatr Nurs. 2020;41(2):158–64.
27. Shahrbabaki PM, Abolghaseminejad P, Iari LA, Zeidabadinejad S, Dehghan M. The relationship between nurses' psychological resilience and job satisfaction during the COVID-19 pandemic: a descriptive-analytical cross-sectional study in Iran. BMC Nurs. 2023;22(1):137.
28. Wang X, Li C, Chen Y, Zheng C, Zhang F, Huang Y, Birch S. Relationships between job satisfaction, organizational commitment, burnout and job performance of healthcare professionals in a district-level health care system of Shenzhen, China. Front Psychol. 2022;13:992258.
29. Boyatzis RE. The competent manager: A model for effective performance. Wiley; 1991.
30. Bakker AB, Demerouti E. Job demands-resources theory: taking stock and looking forward. J Occup Health Psychol. 2017;22(3):273–85.
31. WARR P, COOK J, WALL T. Scales for the measurement of some work attitudes and aspects of psychological well-being. J Occup Psychol. 1979;52(2):129–48.
32. Gray-Toft P, Anderson JG. The nursing stress scale: development of an instrument. J Behav Assess. 1981;3(1):11–23.
33. Gheshlagh RG, Parizad N, Dalvand S, Zarei M, Farajzadeh M, Karami M, Sayehmiri K. The prevalence of job stress among nurses in Iran: A meta-analysis study. Nurs Midwifery Stud. 2017;6(4):143–8.
34. Koopmans L, Bernaards C, Hildebrandt V, Van Buuren S, Van der Beek AJ, De Vet HC. Development of an individual work performance questionnaire. Int J Productivity Perform Manage. 2012;62(1):6–28.
35. Van Zyl LE, Klibert J, Shankland R, Stavros J, Cole M, Verger NB, Rothmann S, Cho V, Feng K, See-To EW. The academic task performance scale: psychometric properties, and measurement invariance across ages, genders and nations. Frontiers in education: 2024. Frontiers Media SA; 2024. p. 1281859.
36. Smith BW, Dalen J, Wiggins K, Tooley E, Christopher P, Bernard J. The brief resilience scale: assessing the ability to bounce back. Int J Behav Med. 2008;15(3):194–200.
37. Kline RB. Principles and practice of structural equation modeling. 4th ed. New York, NY, US: Guilford Press; 2016.
38. BENTLER PM, CHOU C-P. Practical issues in structural modeling. Sociol Methods Res. 1987;16(1):78–117.
39. Bakertzis E, Papadionysiou E, Barbara M. The relationship between organizational culture and employees' work attitudes in hospitals in Greece. J Qual Health Care Econ. 2022;5(1):1–11.
40. Xu H, Cao X, Jin QX, Wang RS, Zhang YH, Chen ZH. The impact of the second victim's experience and support on the career success of psychiatric nurses: the mediating effect of psychological resilience. J Nurs Manag. 2022;30(6):1559–69.
41. Supri A, Rachmawaty R, Syahrul S. Nurses' performance assessment based on nursing clinical authority: A qualitative descriptive study. J Nurs Pract. 2019;2(2):80–90.
42. Serrão C, Duarte I, Castro L, Teixeira A. Burnout and depression in Portuguese healthcare workers during the COVID-19 Pandemic-The mediating role of psychological resilience. Int J Environ Res Public Health. 2021:18(2).
43. Bajaj B, Khoury B, Sengupta S. Resilience and stress as mediators in the relationship of mindfulness and happiness. Front Psychol. 2022;13:771263.
44. Wei H, Roberts P, Strickler J, Corbett RW. Nurse leaders' strategies to foster nurse resilience. J Nurs Manag. 2019;27(4):681–7.
45. Dias JM, Subu MA, Al-Yateem N, Ahmed FR, Rahman SA, Abraham MS, Forootan SM, Sarkhosh FA, Javanbakh F. Nursing students' stressors and coping strategies during their first clinical training: a qualitative study in the united Arab Emirates. BMC Nurs. 2024;23(1):322.

46. Xue H, Si X, Wang H, Song X, Zhu K, Liu X, Zhang F. Psychological resilience and career success of female nurses in central China: the mediating role of craftsmanship. Front Psychol. 2022;13:915479.
47. Askaripoor T, Siadat M, Saleh E, Aghaei H. Resilience, job satisfaction, occupational stress, and occupational accidents among healthcare professionals: A bayesian network analysis. Work. 2024;79(3):1357–67.
48. Mantas-Jiménez S, Lluch-Canut MT, Roldán-Merino J, Reig-Garcia G, Juvinyà-Canal D. Resilience and job satisfaction among out-of-hospital emergency medical service professionals: A cross-sectional multi-centric study. J Nurs Manag. 2022;30(6):2084–92.
49. Cooper AL, Brown JA, Rees CS, Leslie GD. Nurse resilience: A concept analysis. Int J Ment Health Nurs. 2020;29(4):553–75.
50. Zhao Y, Wang H, Sun D, Ma D, Li H, Li Y, Zhang X, Xie Z, Sun J. Job satisfaction, resilience and social support in relation to nurses' turnover intention based on the theory of planned behaviour: A structural equation modelling approach. Int J Nurs Pract. 2021;27(6):e12941.
51. Cao X, Li J, Gong S. Effects of resilience, social support, and work environment on turnover intention in newly graduated nurses: the mediating role of transition shock. J Nurs Manag. 2021;29(8):2585–93.
52. Labrague LJ, de Los Santos JAA. Fear of COVID-19, psychological distress, work satisfaction and turnover intention among frontline nurses. J Nurs Manag. 2021;29(3):395–403.
53. Said RM, El-Shafei DA. Occupational stress, job satisfaction, and intent to leave: nurses working on front lines during COVID-19 pandemic in Zagazig City, Egypt. Environ Sci Pollut Res Int. 2021;28(7):8791–801.

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