

Building Resilience: Strategies for Critical Care Nurses Before, During and After the Pandemic Crisis

Yee Bit-Lian

Nursing Department, School of Health Sciences, IMU University, Kuala Lumpur, Malaysia

ABSTRACT

Background: This integrative review investigates the resilience of critical care nurses before, during, and after the COVID-19 pandemic, highlighting changes over time and identifying strategies to address burnout and moral distress.

Methods: A systematic search across Google Scholar, BioMed Central, EBSCO CINAHL, and ELSEVIER Clinical Key Nursing databases included peer-reviewed articles from 2015 to 2024.

Results: The findings reveal significant shifts in resilience: pre-pandemic resilience was shaped by coping mechanisms and ethical work environments; during the pandemic, it was challenged by moral distress, staff shortages, and high patient loads; post-pandemic, adaptive resilience emerged, supported by mindfulness training, peer support, and organizational changes. Despite many studies and strategies, moral distress and burnout persist. Effective leadership, ethical organizational cultures, and targeted resilience-building programs are crucial for recovery.

Conclusion: The review concludes that resilience among critical care nurses is dynamic and adaptive but remains susceptible to organizational and individual challenges. Integrating personal and organizational strategies into nursing practice is essential for fostering resilience and addressing future crises. This study suggests ongoing research is necessary to evaluate the long-term impact of resilience-building interventions on nurse well-being and patient care.

Keywords: COVID-19; Critical care nurses; Resilience

*Corresponding author

Yee Bit-Lian
Nursing Department,
School of Health Sciences,
IMU University,
Kuala Lumpur, Malaysia
E-mail: bitlianyee@imu.edu.my

Article History:

Submitted: 13 December 2024
Revised: 20 March 2025
Accepted: 23 March 2025
Published: 31 March 2025

DOI: 10.31436/ijcs.v8i1.427
ISSN: 2600-898X

INTRODUCTION

Nobody can deny that the COVID-19 pandemic has turned the world chaotic, especially for healthcare systems. Our critical care nurses, the frontline warriors in intensive care units (ICUs), have borne the brunt of it. They have been stretched thin by the surge of patients, scarce resources, and the gut-wrenching moral dilemmas that come with making life-and-death decisions during such a crisis. Their resilience and dedication shine through in these challenging times (1). This integrated review examines the resilience of critical care nurses before, during, and after the COVID-19 pandemic, exploring how resilience evolved across these periods and identifying strategies to address challenges such as burnout and moral distress.

Resilience, defined as the ability to adapt and thrive in the face of adversity, is a crucial attribute for healthcare professionals, especially those working in high-stress environments like ICUs, Emergency department, and many more (2). Interestingly, no one will deny of how the critical care nurses in critical and acute settings thrive and strive in their environment. Prior to the pandemic, resilience among critical care nurses was primarily shaped by individual coping mechanisms and supportive work environments (3). These factors enabled nurses to manage the routine challenges of their roles effectively. However, the onset of the COVID-19 pandemic introduced a host of extraordinary stressors that tested the limits of their resilience.

Throughout the pandemic, critical care nurses faced intense moral distress. They were often unable to act on their deeply held ethical beliefs because they were hampered by limited resources and restrictive institutional policies. The critical care nurses have the distress of wanting to do the right thing but being constrained by forces beyond their control. Their dedication was tested to its limits, but their resilience shone through (4,5). The increased patient loads, staff shortages, and the constant threat of infection exacerbated the stress experienced by critical care nurses, leading to substantial psychological strain and burnout (6,7). As a result, resilience was not only challenged but also necessitated adaptation and the development of new coping strategies to withstand the prolonged crisis.

On the other hand, post-pandemic, the resilience of critical care nurses has revealed adaptive qualities, which were supported by various interventions at both individual and

organizational levels (8). Among others, mindfulness training, peer support programs, and organizational changes have appeared as effective strategies to strengthen nurses resilience and mitigate the “lingering effects” of moral distress and burnout (9,10). Despite these efforts, the aftermath of the pandemic continues to present challenges, highlighting the need for sustaining support and targeted resilience-building programs.

Few scholars suggested that effective leadership and ethical organizational cultures are pivotal in fostering resilience among critical care nurses. Nevertheless, leaders who prioritize the well-being of their staff, provide clear communication, and create a supportive work environment contribute significantly to the recovery and sustainability of resilience (11,12). Moreover, integrating resilience-building practices into nursing education and ongoing professional development is essential for preparing nurses to navigate future crises.

This integrative review synthesizes findings from peer-reviewed articles published between 2015 and 2024, providing a comprehensive overview of resilience among critical care nurses across different phases of the COVID-19 pandemic, namely pre, during and post pandemic. The study is to examine how resilience has evolved and identify effective strategies to support it, this review aims to inform policy and practice, ensuring that critical care nurses are better equipped to face future challenges.

While several studies have explored resilience among healthcare professionals, especially critical care nurses, at this point of review, the researcher noticed significant gaps in the existing literature that need to be addressed. First and foremost, existing research mostly focuses on resilience at a single time point. Which meant, they are either before, during, or after the pandemic, without examining the dynamic evolution of resilience across multiple phases, such as pre-pandemic, pandemic, and post-pandemic periods (3,10). This segmented approach limits our understanding of how resilience develops and changes over time under sustained stress. Interestingly, the concept of resilience has been of interest to various professional groups for many years (3). According to Gillespie and colleagues (3), worth to mention, however, only recently that the nursing profession has begun to recognise its potential contribution in diverse clinical contexts. Secondly, at this point of review, there is limited exploration of the comparative effectiveness of individual

versus organizational strategies in fostering resilience. Although some studies highlight interventions like mindfulness training (9) and ethical organizational practices (11), but, they do not fully clarify how they mitigate specific challenges such as burnout and moral distress. Lastly, few studies address the long-term consequences of these strategies. For example, it remains uncertain how resilience strategies implemented during the pandemic have influenced critical care nurses' well-being and professional sustainability in the post-pandemic reform. Understanding these gaps is essential to designing evidence-based and sustainable policies that support resilience-building among critical care nurses, preparing them for both routine challenges and future crises. The objectives of this review are aimed to answer these research questions:

1. How does resilience evolve among critical care nurses during and after pandemic crises, and what factors contribute to its development over time?
2. What organizational factors (such as leadership, staffing policies, and resilience programs) significantly impact the resilience of critical care nurses in their everyday clinical policies and practices to enhance their long-term economic workforce?
3. What strategies have been identified as most effective in building resilience among critical care nurses?
4. How do burnout and moral distress affect the resilience of critical care nurses, and what interventions can mitigate these negative impacts?

METHODS

Data Collection

Data was searched using several electronic databases: Google Scholar, BioMed Central (BMC), EBSCO CINAHL, and ELSEVIER Clinical Key Nursing. Keywords used to narrow down the searches include "critical care nurs*", "COVID-19", "coping mechanism", "resilien*", "mental health", and "burnout". The researcher initially focused on papers from the year 2015-2024, but also expanded to include others that were more appropriate to the topic and especially those papers that were highly cited by other researchers. This 2015-2024 period was chosen because it captures the significant developments in healthcare, nursing practices, and the global

challenges faced by critical care nurses, particularly during the COVID-19 pandemic. Moreover, advances in resilience-building strategies and organizational frameworks, as well as the pandemic itself, fall within this suggested timeline, making this period highly pertinent to this review objectives. Furthermore, earlier literature prior to 2015 may not fully reflect the evolving nature of resilience in high-stress healthcare environments, especially in light of the unique challenges posed by the pandemic. By focusing on this timeframe, the study ensures an up-to-date and focused synthesis of findings, aligning with current clinical practices and policy needs.

This integrative review was based on the framework in the **Table 1** by Whittemore and Knafl (13). The criteria of inclusion and exclusion can be seen in the **Table 2**. From an initial 2,148 journal articles, 27 studies were selected in the end which are included in the present review (**Table 3**).

Summary of Studies Selected for This Review

Table 3 shows a brief overview of the studies that have been selected. The table identifies each articles' research question/objectives, the methodology design, the setting and sample size, the results and analysis and its conclusions. Subsequently, the data gathered from the literature review will be divided and analysed according to theme, which is further discussed in the section below.

Themes

From the literature chosen, seven prominent themes can be identified. This includes (1). Evolution of Resilience across pandemic; (2). Impact of Organizational Factors on Resilience; (3). Strategies for Building Resilience; and (4). Burnout, Moral Distress, and Resilience Relationship. The appearance of these themes in the literature can be seen in **Table 4**.

DISCUSSION

Evolution of Resilience Across Pandemic

Resilience among critical care nurses has undergone a significant transformation from the pre-pandemic to the post-pandemic periods. Prior to the COVID-19 pandemic, resilience was primarily influenced by personal attributes, such as coping mechanisms, years of professional experience, and individual emotional intelligence

(14,15,27). Organizational supports, including ethical leadership, accessible professional development programs, and adequate staffing, also played a role in sustaining nurses' resilience (16,17,25). These pre-pandemic factors created a foundation that was severely tested during the pandemic.

The pandemic introduced unprecedented challenges, including heightened workloads, staff shortages, and moral distress due to resource scarcity and ethical dilemmas (18). Nurses faced

extreme physical and psychological stressors, as they were required to care for critically ill patients while confronting their fears of infection and the loss of colleagues and patients. Studies highlight a rise in emotional exhaustion and burnout, often exacerbated by limited access to personal protective equipment and inconsistent institutional policies (19). Despite these challenges, critical care nurses exhibited remarkable adaptability, finding ways to rely on teamwork, peer support, and a sense of purpose to navigate these stressors (16,20,26).

Table 1: The Integrative Review Framework based on Whitemore & Knafl (2005)

No.	Stage of review	Illustrations of decisions for this review
1.	Problem Identification	The COVID-19 pandemic highlighted the importance of resilience among critical care nurses. Existing research mostly focuses on resilience at a single time point. Which mean, they are either before, during, or after the pandemic, without examining the dynamic evolution of resilience across multiple phases, such as pre-pandemic, pandemic, and post-pandemic periods. However, it was unclear how resilience develops and changes over time under sustained stress.
2.	Literature Search	Data was searched using several electronic databases: Google Scholar, BioMed Central (BMC), EBSCO CINAHL, and ELSEVIER Clinical Key Nursing. From an initial 2,148 journal articles, 27 studies were selected in the end which are included in the present review.
3.	Data Evaluation	Selected studies will be assessed using the Critical Appraisal Skills Programme (CASP) for qualitative studies and the Joanna Briggs Institute (JBI) checklist for quantitative studies. Studies will be categorized based on: (i). Methodological rigor; (ii). Relevance to resilience-building in critical care; (iii). Contribution to resilience frameworks.
4.	Data Analysis	A thematic analysis was conducted based on three phases: (i). Pre-pandemic phase- Proactive strategies such as resilience training, leadership development, and institutional preparedness. (ii). During pandemic phase- Crisis response strategies, such as psychological support, ethical leadership, workload management, and staff well-being initiatives. (iii). Post-pandemic phase- Recovery and long-term resilience programs, policy integration, and staff retention efforts.
5.	Presentation	Findings were presented using a narrative synthesis, with thematic tables illustrating resilience strategies before, during, and after the pandemic crisis. The review will provide recommendations for healthcare leadership, policy development, and future research to strengthen resilience in critical care nursing.

Table 2: Inclusive and Exclusive Criteria

Inclusive criteria	Exclusive criteria
Focus on the resilience among critical care nurses, including those working in ICU, ER, and other high-acuity settings.	Those not related to the resilience among critical care nurses.
English Language.	Non-English language.
Full articles with citations published from 2015- 2024 to capture pre, during and post pandemic Covid-19.	Exclude studies published without full text.
Research papers discussing organizational and individual resilience-building strategies. And, studies linking resilience with moral distress, burnout, or coping	Exclude studies that unrelated to resilience, moral distress, or burnout. Also, commentaries, editorials, or opinion pieces without empirical evidence.
Focus on variety of study designs, such as qualitative, quantitative, and mixed-method studies, randomized controlled trials, longitudinal studies, and comprehensive literature reviews.	Exclude studies with poor methodologies, such as small sample sizes, weak data analysis techniques, non-peer-reviewed sources.

Table 3: Studies selected for inclusion criteria

No	Author/ Year	Research Question(s)/ Hypotheses/ Objectives	Methodology Design/ Setting/ Sample size	Instruments/ Tools	Findings/ Results (major)
1.	Jun & Costa (2020)	Understanding burnout as a social phenomenon, particularly through the lens of emotional contagion. Exploring interpersonal and social relationships among nursing teams as potential interventions to mitigate burnout.	Design: narrative literature review and theoretical discussion.	The discussion incorporates findings and concepts from prior research studies, using tools such as emotional contagion theories, the International Classification of Diseases for burnout, and metrics from healthcare-related organizational studies.	Burnout in critical care nurses is common, driven by high job demands, low control, and lack of support. Emotional contagion exacerbates burnout within teams. Existing interventions often overlook team dynamics. Proposed strategies include storytelling, peer support, and expressive writing, emphasizing human connections. Systemic policy changes are needed to prioritize burnout prevention.
2.	Zenani et al. (2022)	The aim of this study is to analyse previous literature conducted on strategies that enhance resilience in ICU nurses to cope with workplace adversities beyond the coronavirus disease 2019 (COVID-19) pandemic.	An integrative literature review was chosen for the study.	PRISMA flow chart.	Three themes emerged from the study, namely promoting personal attributes, effective relational support and active psychological support. The findings of the review have highlighted specific strategies of improving resilience in ICU nurses, which can ultimately create a safe working environment in the ICU.
3.	Cadge et al. (2021)	To understand how nurses experience providing care for patients hospitalized with COVID-19 in intensive care units.	Qualitative, semi-structured interviews. 16 ICUs nurses caring for COVID-19 patients during the first surge of the pandemic; purposive sampling. ICUs of a quaternary 1,000-bed hospital in the Northeast United States.	semi-structured interviews.	The exploratory study identified four themes that describe the experiences of nurses providing care to patients in COVID-19 ICUs during the first surge: (a) challenges of working with new co-workers and teams, (b) challenges of maintaining existing working relationships, (c) role of nursing leadership in providing information and maintaining morale and (d) the importance of institutional-level acknowledgement of their work.
4.	Jackson et al. (2018)	This study was conducted to better understand nurse burnout and resilience in response to workplace	Grounded theory using Corbin and Strauss methodology, qualitative,	Open-ended face-to-face interviews, memos (participant's body language, tone and the environment) and reflexive memoing.	Resilience and burnout are indicators of how critical care nurses respond to workplace adversity, which includes protecting, processing, decontaminating, and distancing. Awareness and

		adversity in critical care.	open-ended interviews. A multi-site, urban, teaching hospital in Canada. 11 female critical care nurses.	Consisting of two journals. (*One journal was a narrative reflexive writing on the research content and process, and the other focused on reflections about the research methodology and decision-making.)	organizational policies are crucial. Nurse leaders play a key role in mitigating adversity and promoting resilience through targeted interventions.
5.	Almeida and Poeira (2023)	This study aimed to evaluate burnout in intensive care unit nurses and describe the relationship between burnout dimensions and sociodemographic and professional variables.	A pilot study was carried out with 29 intensive care nurses during the COVID-19 pandemic. Setting: Portugal. The data were collected using an online questionnaire	Maslach Burnout Inventory Human Services Survey.	The global results point to high levels of burnout in nurses, with greater expression in the Emotional Exhaustion and Professional Fulfillment domains. There were no differences between groups, demonstrating homogeneity in the team's level of burnout. This pilot study will allow the defining of strategies for reducing burnout and, consequently, a proposed extension of the study to other organization wards.
6.	Alvares et al. (2020)	To assess the prevalence of and factors associated with Burnout syndrome among intensive care unit professionals.	A cross-sectional population-based study, a questionnaire assessing sociodemographic, behavioral, and occupational data. 241 nurses and physicians working in 17 public intensive care units in Sao Luis (MA), Brazil.	The Maslach Burnout Inventory - Human Services Survey was used to identify Burnout syndrome based on Maslach's and Grunfeld's criteria.	This study demonstrated the low prevalence of Burnout syndrome. Most of the professionals reported low levels for each dimension of Burnout, including low levels of emotional exhaustion, low levels of depersonalization, and a lower likelihood of having a reduced sense of personal accomplishment. Nurses and physicians have different characteristics associated with Burnout syndrome.
7.	Hasan et al. (2024)	This study assessed the prevalence of burnout syndrome among anesthesiologists, anesthesia technicians, and intensive care unit (ICU) nurses in Palestinian hospitals.	A cross-sectional design using a questionnaire. The healthcare providers were included from 12 different hospitals. Setting: Palestine.	Burnout syndrome was assessed using the Maslach Burnout Inventory-Human Services Survey for Medical Personnel (MBI-HSS-MP).	The findings of this study indicated that burnout syndrome was prevalent among anesthesiologists, anesthesia technicians, and ICU nurses in Palestinian hospitals. Healthcare authorities and professional bodies should consider designing interventions to reduce burnout and improve the psychological well-being of anesthesiologists, anesthesia technicians, and ICU nurses.

8.	Purvis et al. (2019)	The purpose of this study was to characterize resiliency and burnout among health care professionals in the neurosciences critical care unit (NCCU) at a tertiary care center.	A cross-sectional design, Qualtrics® electronic survey. 65 Neurosciences Critical Care Unit (NCCU) clinical staff (49 were nurses). Setting: USA.	The survey assessed burnout using the abbreviated Maslach Burnout Inventory (aMBI) and resiliency using the ten-question Connor-Davidson Resilience Scale (CD-RISC 10).	This study is the first to characterize levels of burnout and resiliency among NCCU providers. A significant minority of participants reported high levels of emotional exhaustion and depersonalization, with those working longer in the NCCU more likely to experience emotional exhaustion.
9.	Friganović et al., (2021)	The aims of this study were to explore the associations between levels of burnout syndrome, coping mechanisms and job satisfaction in critical care nurses in multivariate modelling process. A specific aim was also to explore whether coping and job satisfaction in critical care nurses are gender related.	A cross-sectional multicentre study, using a convenience sample of 620 critical care nurses from 5 university hospitals in Croatia.	Maslach Burnout Inventory and the Ways of Coping and Job Satisfaction Scale together with the nurses' demographic profiles.	The association between job satisfaction and burnout in nurses urges hospital management teams to consider actions focused on job satisfaction, probably modifications of the work environment.
10.	Botha et al., (2015)	To identify the effectiveness of mindfulness-based programs (originating from the Mindfulness-Based Stress Reduction (MBSR) program) in reducing stress among nurses working in adult hospitalized patient care settings.	Type/design: Systematic review of quantitative evidence. Setting and sample size: varies.	Perceived Stress Scale (PSS-14, PSS-10, PSS-4). Depression Anxiety Stress Scale (DASS-21).	The review protocol highlights expected benefits of mindfulness interventions, such as: Reduction in perceived stress, anxiety, and depression among nurses. Improvement in mindfulness skills, leading to better emotional regulation and coping mechanisms. It emphasizes that mindfulness programs, including MBSR, have proven effective in clinical and non-clinical populations.
11.	Othman et al. (2023)	This study aims to examine the effectiveness of MBIs (MBSR) on burnout, mindfulness, and self-compassion among CCNs caring for patients with COVID-19.	This quasi-experimental prospective study conducted pre- and post-test assessments in the intervention and control groups. 60 in total- 30 each group. 3 ICUs of three Ministry of	The participants in the intervention group (MBI) received 8 MBI sessions, whereas the control group received no intervention. The Maslach Burnout Inventory, the Five-Facet Mindfulness Questionnaire (FFMQ), and the Self-Compassion Scale were used to assess the outcomes.	This study provides preliminary evidence that MBI sessions were effective in reducing emotional exhaustion and depersonalization and increasing levels of mindfulness and self-compassion among critical care nurses.

			Health-affiliated COVID-19 quarantine hospitals in El-Beheira Governorate of Egypt.		
12.	Bodini et al. (2022)	The purpose of the intervention is to reduce burnout and psychological distress amongst frontline nurses involved in the clinical management of COVID-19 patients.	<p>A parallel-group randomized controlled trial.</p> <p>72 participants will be recruited from Verona University Hospital Trust (Veneto Region, north-east Italy).</p> <p>Divided equally into an intervention group and a control group.</p>	<p>Primary outcome- using the Emotional Exhaustion subscale of the Maslach Burnout Inventory General Survey (MBI-GS).</p> <p>Secondary outcomes- Cynicism and Professional Efficacy subscales of the MBI-GS, the Patient Health Questionnaire (PHQ-9), the Generalized Anxiety Disorder (GAD-7), the Insomnia Severity Index (ISI), the Impact of Stressful Events (IES-R), the Perceived Stress Scale (PSS), the Five Facet Mindfulness Questionnaire (FFMQ), and the Forms of Self-Criticising/attacking and Self-Reassuring Scale (FSCRS).</p>	The primary focus is on assessing changes in emotional exhaustion, a key component of burnout, as measured by the Emotional Exhaustion subscale of the Maslach Burnout Inventory-General Survey (MBI-GS). This will be evaluated before treatment, after the intervention, and one-month post-treatment.
13.	Córdova-Martínez et al. (2023)	Investigated the relationship between functional and physiological indicators and the quality of professional life in nurses of Emergency Departments of two public hospitals.	<p>Analytical, Descriptive, and Cross-sectional: The study was designed to analyze relationships between variables (e.g., stress, fatigue, quality of professional life) at a specific point in time during the nurses' morning shifts.</p> <p>59 professionals (49 women and 10 men) participated in the study.</p> <p>Emergency Departments of two public</p>	<p>Cortisol (an indicator of stress) and post-test lactate (an indicator of fatigue) were analyzed in saliva and in the blood, respectively, at the beginning and at the end of the morning shift.</p> <p>The CVP-35 survey (Spanish version of the QPL-35 questionnaire) was used to assess the quality of professional life.</p>	<p>Stress and Cortisol Levels: Cortisol levels, which indicate stress, were higher at the beginning of the nurses' shifts and decreased by the end of the shift.</p> <p>Fatigue and Lactate Levels: Blood lactate levels, a marker of fatigue, increased significantly by the end of the working day for both male and female nurses.</p> <p>Handgrip Strength (HS): No significant changes were observed in handgrip strength from the beginning to the end of the shift, although a tendency to decrease was noted, especially among women.</p> <p>Quality of Professional Life(QPL): Overall, the QPL scores indicated acceptable levels, with high scores for <i>Managerial Support</i> and <i>Intrinsic Motivation</i>.</p>

			hospitals, Spain.		Gender Differences: Men reported a significantly higher perception of quality of life at work compared to women, though the differences in stress and fatigue markers were less pronounced.
14.	Lopez et al. (2022)	The purpose of this study was to assess burnout, secondary traumatic stress, and compassion satisfaction scores in emergency nurses after working through the COVID-19 pandemic using the Professional Quality of Life Scale version 5 and compare those scores with similar studies conducted before the pandemic.	A cross-sectional analysis of a descriptive survey. 220 nurses working in the emergency department from urban, adult, and pediatric receiving hospitals in Southern California. Setting: USA.	Professional Quality of Life Scale version 5 questionnaire (ProQOL).	The scores from mid-shift nurses reflect increased burnout and secondary traumatic stress whereas nurses with 2 children had lower compassion satisfaction. This implies the need for leadership to proactively seek interventions to support nurses on each shift.
15.	Arikan and Esenay (2023)	This study was conducted to determine compassion fatigue and burnout in nurses working in the pediatric emergency department (PED) during the COVID-19 pandemic in Turkey.	Descriptive and cross-sectional study. 164 nurses working in the PED and following the social media platforms of the Emergency Nurses Association. Setting: Turkey.	Data were collected using the online survey method with the Descriptive Data Form, Maslach Burnout Inventory (MBI), and Compassion Fatigue-Short Scale (CF-SS).	Pediatric emergency nurses had high levels of burn out and moderate levels of compassion fatigue during the pandemic in Turkey. To prevent any long-term negative effects of the pandemic, addressing the physiological, psychological, and psychosocial needs of nurses should be prioritized.
16.	Goktas et al. (2022)	This study aimed to investigate the effect of motivational messages sent to emergency nurses during the COVID-19 pandemic on their job satisfaction, compassion fatigue, and communication skills.	This was a randomized controlled experimental study. 60 emergency nurses in 2 training and research hospitals, Istanbul. The participants were randomly assigned to the intervention	The Job Satisfaction Scale, Compassion Fatigue Scale, and Communication Skills Scale -before and after the intervention.	The study found that motivational messages sent to emergency nurses during the COVID-19 pandemic significantly improved their job satisfaction and communication skills while reducing compassion fatigue. Nurses in the intervention group showed higher post-test scores in job satisfaction and communication, and lower compassion fatigue scores compared to the control group.

			and control groups. Participants in the intervention group (n=30) received daily motivational messages to their mobile phones by short message service for 21days; those in the control group (n=30) received no motivational messages.		
17.	de Azevedo Bringel et al. (2023)	This study aimed to investigate the relationship between chronotype and work-related stress, as measured by salivary cortisol levels and burnout, among health professionals working in neonatal intensive care units.	A cross-sectional study was conducted across four public hospitals in Fortaleza, Ceará, Brazil. 256 health professionals, NICU.	Brazilian version of the Burnout Characterization Scale, the morningness-eveningness questionnaire, for chronotype, a sociodemographic questionnaire that included lifestyle habits and a salivary cortisol test.	The study found that most NICU professionals had intermediate (46.7%) or morning chronotypes (46.3%). Morning chronotype was linked to older age, being female, married, and having children. Higher cortisol levels were observed at the start of shifts for those with misaligned chronotypes, while cortisol decreased throughout shifts, possibly due to chronic stress adaptation. The findings suggest that adapting working hours to an individual's biological rhythm can help mitigate potential negative effects on physical and mental health.
18.	Alzailai et al. (2021)	This review aims to assess the degree of well-being of nurses working in critical care settings in Saudi Arabia by evaluating their levels of burnout and job satisfaction, as well as the factors that contribute to them.	Scoping review. Seven databases were searched. Eleven studies related to burnout and job satisfaction.	Prisma Flow Diagram (Moher et al., 2009).	The review highlights important findings for policy and nursing practice that can inform future studies and the development of burnout management strategies.
19.	Brown et al. (2021)	This study identified sources of resilience that clinicians used to cope with frontline challenges during the COVID-19 pandemic.	Using qualitative thematic analysis, an inductive, phenomenological approach, with semi-structured interviews.	Criteria for reporting qualitative research (COREQ) guidelines	Three sources of resilience were identified by respondents: personal, relational, and organisational. A positive mindset, sense of purpose, and self-care behaviours emerged as key sources of personal resilience. Teamwork, altruism, and social support from family and friends contributed to

			<p>20 frontline health professionals (nurses, medical practitioners, or allied health clinicians), across five Australian hospitals.</p> <p><i>*Twenty-one participants were invited for an interview, out of whom one subsequently declined for personal reasons.</i></p>		<p>relational resilience. Leadership, effective communication, and effective implementation of COVID-19 policies were associated with resilience at the organisational level.</p>
20.	Alsaeed et al. (2023)	Aim to identify and explore the psychological impact of COVID-19 in Kuwait on healthcare professionals in close contact with patients.	<p>Using qualitative semi-structured interviews.</p> <p>20 healthcare professionals across Ministry of Health hospitals who were part of COVID teams.</p>	A semi-structured topic guide was developed in both Arabic and English. This has been informed by previous research.	Three themes emerged to help prepare future healthcare frontline workers on an individual, organizational, and national level: enhance self-resilience, a better-equipped workforce and healthcare environment, and mitigate stigma and increase public awareness.
21.	Alqahtani et al. (2019)	To explore the magnitude and determinants of burnout among emergency physicians and nurses working at emergency departments of hospitals in Abha and Khamis Mushait cities.	<p>A cross-sectional hospital-based study.</p> <p>Emergency departments of hospitals in Abha and Khamis Mushait cities belonging to Ministry of Health.</p> <p>Physicians (n=95) and nurses (n=187)</p>	Maslach burnout inventory (MBI) to assess the three components of the burnout syndrome: emotional exhaustion, depersonalization, and reduced personal accomplishment.	The study revealed that 88.7% of emergency healthcare professionals experienced high emotional exhaustion, with an overall burnout prevalence of 16.3%. Male healthcare professionals faced nearly three times the risk of burnout compared to females (aOR=2.76, 95% CI: 1.21-6.28, p=0.017). Smokers had a significantly higher risk of burnout than nonsmokers (aOR=15.37, 95% CI: 7.06-33.45, p<0.001). Additionally, those taking medications for sleep disorders were at greater risk of burnout compared to those without such a history (aOR=6.59, 95% CI: 2.08-20.81, p=0.001).
22.	Babanataj et al. (2018)	The aim of this study was to determine the effect of training for resilience on the intensive care unit nurses' occupational	A quasi-experimental intervention study.	The resilience training was provided in 5 sessions of 90 to 120 minutes. The pretest-post-test approach was used in this study, and	The mean score of the occupational stress of the participants decreased significantly after the intervention (P = .001), and the mean score of resilience

		stress and resilience level.	30 nurses who were selected from critical care units of an educational hospital in Sari City, Iran, through convenience sampling.	the nurses completed the Connor-Davidson Resilience Scale, and Expanded Nursing Stress Scale, before and 2 weeks after the training program.	increased significantly after the intervention ($P = .001$). The results confirm the effectiveness of resilience training on occupational stress and resilience level of nurses working in the intensive care units.
23.	Alharbi et al. (2019)	The aim of this study was to examine the relationship between nurse demographic characteristics and the development of compassion fatigue, as indicated by level of burnout and compassion satisfaction in critical care nurses in Saudi Arabia.	A cross-sectional study design. Critical care nurses (n = 321) in four Saudi public hospitals.	The ProQOL-5 scale has 30 items representing the combination of earlier subscales on coping strategies (CS) with compassion fatigue (CF) (Figley, 1995; Stamm, 2012), and burnout (BO) (Sansbury, Graves, & Scott, 2015). The coping strategy questionnaire (CSI) is composed of 33 items divided into three scales, each containing 11 variables (Amirkhan & Auyeung, 2007). The Connor-Davidson Resilience Scale (CD-RISC) questionnaire is used as a measure of stress and coping ability and is targeted to treat stress and depression. It comprises 25 items rated from 0 to 4 (Connor & Davidson, 2003).	The results show both demographic and workplace structural elements, such as length of work shift, education level, and nationality, were all significant factors in resilience to compassion fatigue among Saudi critical care nurses, whereas factors of age and sex were not significant.
24.	Stutzer and Rodriguez (2020)	To explore the concept of moral resilience as a strategy to address moral distress in critical care nurses. To provide evidence-based strategies for building moral resilience at both individual and organizational levels.	Literature review and discussion incorporating theoretical and practical perspectives on moral resilience. Setting: Focused on critical care environments and nursing practices.	Moral Distress Scale (Corley, 2001), Moral Distress Scale-Revised (2010), and Measure of Moral Distress for Healthcare Professionals (2019).	Strategies to build moral resilience include: Personal development (e.g., mindfulness, education, stress reduction techniques); Organizational support (e.g., ethics consultation, healthy work environments, and leadership fostering ethical practice).
25.	Guttormson et al. (2022)	The purpose of this study was to describe the impact of COVID-19 on nurse moral distress, burnout, and mental health.	Descriptive, cross-sectional study. 488 nurses who worked in	Moral Distress was measured with the Measure of Moral Distress in Healthcare Professionals (MMD-HP).	Over two thirds of respondents experienced a shortage of personal protective equipment (PPE). Nurse respondents reported moderate/high levels of

			<p>the ICU during the COVID-19 pandemic through the American Association of Critical Care Nurses newsletters and social media.</p> <p>Setting: USA</p>	<p>Burnout was measured with the burnout subscale of the Professional Quality of Life Scale (ProQOL-5).</p> <p>PTSD symptoms were measured by the Trauma Screening Questionnaire (TSQ).</p> <p>The Patient Health Questionnaire Anxiety and Depression Scale (PHQ-ADS) was used to measure anxiety and depression.</p>	<p>moral distress and burnout. Forty-seven percent of respondents were at risk for having posttraumatic stress disorder (PTSD). Lack of perceived support from administration and shortage of PPE were associated with higher levels of burnout, moral distress, and PTSD symptoms.</p>
26.	Talebian et al. (2022)	<p>The present study aimed to evaluate the relationship between resilience and moral distress among Iranian critical care nurses.</p>	<p>A cross-sectional correlational study.</p> <p>144 critical care nurses working in intensive care units (ICUs) of 5 teaching hospitals affiliated to Mazandaran University of Medical Sciences.</p>	<p>Data were collected using a 36-item moral distress questionnaire and a 25-item Connor-Davidson Resilience Scale (CD-RISC) questionnaire.</p>	<p>The results of the present study indicated a positive correlation between resilience and moral distress in nurses working in ICUs.</p>
27.	Giannetta et al. (2022)	<p>This systematic review aimed to describe the intensity and frequency of moral distress experienced by nurses in ICUs, as assessed by Corley's instruments on moral distress (the Moral Distress Scale and the Moral Distress Scale-Revised). Additionally, this systematic review aimed to summarize the correlates of moral distress.</p>	<p>A systematic search and review were performed using the following databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL), the National Library of Medicine (MEDLINE/PubMed), and Psychological Abstracts Information Services (PsycINFO).</p>	<p>The review methodology followed PRISMA guidelines. The quality assessment of the included studies was conducted using the Newcastle-Ottawa Scale.</p>	<p>The review found moderate moral distress among ICU nurses, triggered by patient, unit/team, or system factors. Nurses with less experience, younger age, female gender, and job-leaving intentions had higher distress. Professional autonomy and empowerment were positively correlated with moral distress, while support from head nurses reduced it.</p>

Table 4: The prevalence of themes in articles reviewed

No.	Author/ Year	Evolution of resilience across pandemic	Impact of organizational factors on resilience	Strategies for building resilience	Burnout, moral distress and resilience relationship
1.	Jun & Costa (2020)	X		X	
2.	Zenani et al. (2022)	X	X		X
3.	Cadge et al. (2021)	X	X		
4.	Jackson et al. (2018)	X	X		X
5.	Almeida and Poeira (2023)	X		X	X
6.	Alvares et al. (2020)				X
7.	Hasan et al. (2024)				X
8.	Purvis et al. (2019)		X		X
9.	Friganović et al., (2021)		X	X	
10.	Botha et al., (2015)		X	X	X
11.	Othman et al. (2023)		X	X	
12.	Bodini et al. (2022)		X	X	X
13.	Córdova-Martínez et al. (2023)				X
14.	Lopez et al. (2022)		X		
15.	Arikan and Esenay (2023)	X		X	X
16.	Goktas et al. (2022)	X	X	X	
17.	de Azevedo Bringel et al. (2023)		X		X
18.	Alzailai et al. (2021)		X		X
19.	Brown et al. (2021)	X	X	X	
20.	Alsaeed et al. (2023)	X		X	X
21.	Alqahtani et al. (2019)				X
22.	Babanataj et al. (2018)			X	
23.	Alharbi et al (2019)	X			X
24.	Stutzer and Rodriguez (2020)	X	X	X	
25.	Guttormson et al. (2022)	X	X		X
26.	Talebian et al. (2022)			X	X
27.	Giannetta et al. (2022)		X		X

In the post-pandemic period, the focus has shifted toward recovery and building long-term resilience. Evidence suggests that resilience levels have stabilized as nurses have adapted to ongoing challenges (21). However, lingering moral distress and post-traumatic stress disorder (PTSD) symptoms persist, underscoring the need for continued individual and organizational interventions (18). This evolution demonstrates the dynamic nature of resilience and highlights the necessity of targeted strategies to enhance and sustain it over time.

Impact of Organizational Factors on Resilience

The resilience of critical care nurses during the pandemic has been profoundly influenced by their work environment. Organizational factors have been key, with leadership standing out as a crucial element. When times were tough, ethical leaders offered guidance and comfort, helping nurses navigate the uncertainty with a sense of direction and support. Their compassionate leadership made a significant difference in bolstering resilience among the nursing staff. Leaders who prioritized transparent communication,

psychological safety, and supportive resources positively influenced nurses’ ability to cope with challenges (16,17,26). Conversely, a lack of perceived administrative support exacerbated burnout and moral distress, undermining resilience (18,22,36).

Policies and programs designed to support resilience also varied in effectiveness. Initiatives such as resilience training, mindfulness-based interventions, and motivational messaging demonstrated potential for reducing burnout and enhancing well-being (23,28). These interventions, however, were not universally implemented, leaving gaps in support for many critical care nurses. Research indicates that fostering a positive work environment through adequate staffing, flexible scheduling, and ethics consultations can significantly enhance resilience (16,21,37).

One could not deny the pandemic also highlighted institutional shortcomings, such as insufficient staffing and delayed implementation of support programs. These challenges highlighted previously were crucial to mitigate the proactive planning and resource allocation for handling

future crises. To keep our nurses strong and committed, we need to make lasting changes in the organizations. This means enforcing exiting resilience frameworks into the everyday clinical policies and practices (22). Doing so is key to maintaining resilience and preventing nurse attrition (20).

Strategies for Building Resilience

Individual strategies have been equally important in fostering resilience among critical care nurses. Pre-pandemic approaches focused on self-care practices, mindfulness, and emotional intelligence, which allowed nurses to maintain mental and emotional well-being (24,31,35). We foresee that these strategies laid the groundwork for the personal resilience that would be critical during the pandemic.

During the pandemic, nurses adapted by leaning into relational support, including teamwork and connections with colleagues and loved ones (20,27). Many also employed personal coping mechanisms such as reflective journaling, mindfulness meditation, and spiritual practices to manage stress and anxiety (23,35). These practices were essential in mitigating the psychological toll of moral distress and the physical demands of extended shifts and frequent relocation during the pandemic.

Nevertheless, in the post-pandemic, most critical care nurses have recognized the need to transition from reactive to proactive resilience strategies. This includes engaging in emotional intelligence training, seeking mentorship, and participating in professional development programs that emphasize resilience-building (17,26). Many scholars suggest that cultivating mindfulness, practicing self-compassion, and fostering a growth mindset can enhance resilience and reduce the risk of burnout (19). These findings highlight how important it is for the critical care nurses to take charge of their own resilience. Personal strategies play a vital role in building resilience and work hand-in-hand with organizational support (37). The association between job satisfaction and burnout in nurses urges hospital management teams to consider actions focused on job satisfaction, probably modifications of the work environment (39). However, one should be reminded that while organizations can provide the framework, the true strength comes from within each nurse.

Burnout, Moral Distress, and Resilience Interconnection

The relationship intertwined between burnout, moral distress, and resilience is complex and multifaceted. For the past 5 years, we witness the pandemic amplified these dynamics, with critical care nurses experiencing heightened moral distress due to ethical dilemmas, such as resource allocation and end-of-life decision-making (18). This distress often led to burnout, characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment (16,19,37). Alvares's study (33) reported that most of the professionals reported low levels for each dimension of burnout, including low levels of emotional exhaustion, low levels of depersonalization, and a lower likelihood of having a reduced sense of personal accomplishment.

Resilience serves as a mitigating factor, buffering nurses against the adverse effects of moral distress and burnout. Studies have shown that nurses with high resilience levels are better equipped to manage ethical challenges and maintain psychological well-being (21,24,26). Strategies such as resilience training and mindfulness-based interventions have been shown to reduce burnout and enhance emotional regulation, allowing nurses to navigate morally complex situations more effectively (22,32). Interestingly, Córdova-Martínez's study (34) clearly articulated that cortisol levels were higher at the beginning of the nurses' shifts and decreased by the end of the shift. On the other hand, blood lactate levels, a marker of fatigue, increased significantly by the end of the working day for both male and female nurses (34).

However, the interaction between these factors remains a significant concern. Persistent burnout and moral distress can eventually erode resilience over time. This leading to increased risk of nurse attrition and compromised quality of patient care (18,27,30). Addressing this interconnection requires a holistic approach that integrates individual and organizational strategies to build resilience and reduce the prevalence of burnout and moral distress (36). Professional autonomy and empowerment were positively correlated with moral distress, while support from head nurses reduced it (38). The study found that morning chronotype was linked to older age, being female, married, and having children (40). The findings suggest that adapting working hours to an individual's biological rhythm can help mitigate potential negative effects on physical and mental health (40).

CONCLUSION

In conclusion, resilience among critical care nurses is dynamic and adaptive, yet vulnerable to systemic and individual challenges. Addressing these challenges requires a multifaceted approach that incorporates both personal and organizational strategies. Continued research is needed to evaluate the long-term impact of resilience-building interventions on nurse well-being and patient care.

CONFLICT OF INTEREST

The author declares no conflict of interest.

FUNDINGS

The review received no funding from any parties.

ACKNOWLEDGEMENTS

This review is part of the preliminary PhD work before the author enrolls in the program. The author would like to acknowledge Professor Dr. Aini Ahmad for her endless encouragement. Not forgetting, the author would also like to thank Puan Aniszahura Binti Abu Salim, who reminded the author that the idea of the resilience model among critical care nurses is worth continuing.

AUTHOR CONTRIBUTIONS

YBL: Drafted the manuscript and contributed to the conceptualization, design, data collection, analysis and interpretation for the articles.

REFERENCES

- Zhang B, Tao H, Xie M, Zhang J, Zhang M, Zhang Y. Factors associated with professional identity among ICU nurses during COVID-19: A cross-sectional study. *Nurs Open*. 2023;10(8):5701-10. doi:10.1002/nop2.1817.
- Jackson D, Firtko A, Edenborough M. Personal resilience as a strategy for surviving and thriving in the face of workplace adversity: a literature review. *J Adv Nurs*. 2007;60(1):1-9. doi:10.1111/j.1365-2648.2007.04412.x.
- Gillespie BM, Chaboyer W, Wallis M. Development of a theoretically derived model of resilience through concept analysis. *Contemp Nurse*. 2007;25(1-2):124-35. doi:10.5172/conu.2007.25.1-2.124.
- Donkers MA, Gilissen VJHS, Candel MJJM, van Dijk NM, Kling H, Heijnen-Panis R, et al. Moral distress and ethical climate in intensive care medicine during COVID-19: a nationwide study. *BMC Med Ethics*. 2021;22(1):73. doi:10.1186/s12910-021-00641-3.
- Latimer AL, Otis MD, Mudd-Martin G, Moser DK. Moral distress during COVID-19: The importance of perceived organizational support for hospital nurses. *J Health Psychol*. 2023;28(3):279-92. doi:10.1177/1359105322111850.
- Liang Y, Wu K, Zhou Y, Huang X, Zhou Y, Liu Z. Mental Health in Frontline Medical Workers during the 2019 Novel Coronavirus Disease Epidemic in China: A Comparison with the General Population. *Int J Environ Res Public Health*. 2020;17(18):6550. doi:10.3390/ijerph17186550.
- Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors Associated with Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. *JAMA Netw Open*. 2019;3(3):e203976. doi:10.1001/jamanetworkopen.2020.3976.
- Hassan EA, Elsayed SM. Exploring resilience in critical care nursing: a qualitative inquiry into continuous adaptation, collaborative unity, and emotional balance. *BMC Nurs*. 2025 Mar 3;24(1):238. doi:10.1186/s12912-025-02844-0.
- Green AA, Kinchen EV. The Effects of Mindfulness Meditation on Stress and Burnout in Nurses. *J Holist Nurs*. 2021. doi:10.1177/08980101211015818.
- Henshall C, Davey Z, Jackson D. Nursing resilience interventions-A way forward in challenging healthcare territories. *J Clin Nurs*. 2020;29(19-20):3597-9. doi:10.1111/jocn.15276.
- Grimes K, Matlow A, Tholl B, Dickson G, Taylor D, Chan MK. Leaders supporting leaders: Leaders' role in building resilience and psychologically healthy workplaces during the pandemic and beyond. *Healthc Manage Forum*. 2022;35(4):213-7. doi:10.1177/08404704221090126.
- Maben J, Bridges J. Covid-19: Supporting nurses' psychological and mental health. *J Clin Nurs*. 2020;29(15-16):2742-50. doi:10.1111/jocn.15307.
- Whittemore R, Knafk K. The integrative review: updated methodology. *J Adv Nurs*. 2005;52(5):546-53. doi:10.1111/j.1365-2648.2005.03621.x.

14. Alharbi J, Jackson D, Usher K. Personal characteristics, coping strategies, and resilience impact on compassion fatigue in critical care nurses: A cross-sectional study. *Nurs Health Sci.* 2019. doi:10.1111/nhs.12650.
15. Jun J, Costa DK. Is It Me or You? A Team Approach to Mitigate Burnout in Critical Care. *Crit Care Nurs Clin North Am.* 2020;32(3):395-406. doi:10.1016/j.cnc.2020.05.003.
16. Cadge W, Lewis M, Bandini J, Shostak S, Donahue V, Trachtenberg S, et al. Intensive care unit nurses living through COVID-19: A qualitative study. *J Nurs Manag.* 2021;29(7):1965-73. doi:10.1111/jonm.13353.
17. Stutzer K, Rodriguez AM. Moral Resilience for Critical Care Nurses. *Crit Care Nurs Clin North Am.* 2020;32(3):383-93. doi:10.1016/j.cnc.2020.05.002.
18. Guttormson JL, Calkins K, McAndrew N, Fitzgerald J, Losurdo H, Loonsfoot D. Critical Care Nurse Burnout, Moral Distress, and Mental Health During the COVID-19 Pandemic: A United States Survey. *Heart Lung.* 2022;55:127-33. doi:10.1016/j.hrtlng.2022.04.015.
19. Almeida C, Poeira AF. Burnout in Nurses of an Intensive Care Unit during COVID-19: A Pilot Study in Portugal. *Healthcare (Basel).* 2023;11(9):1233. doi:10.3390/healthcare11091233.
20. Brown L, Haines S, Amonoo HL, Jones C, Woods J, Huffman JC, et al. Sources of Resilience in Frontline Health Professionals during COVID-19. *Healthcare (Basel).* 2021;9(12):1699. doi:10.3390/healthcare9121699.
21. Zenani NE, Gause G, Sehularo L. Strategies to enhance resilience to cope with workplace adversities post-COVID-19 among ICU nurses. *Curationis.* 2022;45(1):e1-8. doi:10.4102/curationis.v45i1.2345.
22. Jackson J, Vandall-Walker V, Vanderspank-Wright B, Wishart P, Moore SL. Burnout and resilience in critical care nurses: A grounded theory of Managing Exposure. *Intensive Crit Care Nurs.* 2018. doi:10.1016/j.iccn.2018.07.002.
23. Othman SY, Hassan NI, Mohamed AM. Effectiveness of mindfulness-based interventions on burnout and self-compassion among critical care nurses caring for patients with COVID-19: a quasi-experimental study. *BMC Nurs.* 2023;22(1):305. doi:10.1186/s12912-023-01466-8.
24. Babanataj R, Mazdarani S, Hesamzadeh A, Gorji MH, Cherati JY. Resilience training: Effects on occupational stress and resilience of critical care nurses. *Int J Nurs Pract.* 2018; e12697. doi:10.1111/ijn.12697.
25. Arikan A, Esenay FI. Compassion fatigue and burnout in Turkish pediatric emergency nurses during the COVID-19 pandemic. *J Pediatr Nurs.* 2023;71:120-6. doi:10.1016/j.pedn.2022.11.004.
26. Goktas S, Gezginci E, Kartal H. The Effects of Motivational Messages Sent to Emergency Nurses During the COVID-19 Pandemic on Job Satisfaction, Compassion Fatigue, and Communication Skills: A Randomized Controlled Trial. *J Emerg Nurs.* 2022;48(5):547-58. doi:10.1016/j.jen.2022.06.001.
27. Alsaeed D, Al-Ozairi A, Alsarraf H, Albarrak F, Al-Ozairi E. Are we ready for the next pandemic? Lessons learned from healthcare professionals' perspectives during the COVID-19 pandemic. *Front Public Health.* 2023;30(11):1048283. doi:10.3389/fpubh.2023.1048283.
28. Lopez J, Bindler RJ, Lee J. Cross-Sectional Analysis of Burnout, Secondary Traumatic Stress, and Compassion Satisfaction Among Emergency Nurses in Southern California Working Through the COVID-19 Pandemic. *J Emerg Nurs.* 2022;48(4):366-75.e2. doi:10.1016/j.jen.2022.03.008.
29. Purvis TE, Saylor D. Burnout and Resilience Among Neurosciences Critical Care Unit Staff. *Neurocrit Care.* 2019. doi:10.1007/s12028-019-00822-4.
30. Alqahtani AM, Awadalla NJ, Alsaleem SA, Alsamghan AS, Alsaleem MA. Burnout Syndrome among Emergency Physicians and Nurses in Abha and Khamis Mushait Cities, Aseer Region, Southwestern Saudi Arabia. *Sci World J.* 2019;18:4515972. doi:10.1155/2019/4515972.
31. Talebian F, Hosseinnataj A, Yaghoubi T. The Relationship between Resilience and Moral Distress among Iranian Critical Care Nurses: A Cross-sectional Correlational Study. *Ethiop J Health Sci.* 2022;32(2):405-12. doi:10.4314/ejhs.v32i2.21.
32. Hasan F, Daraghmeh T, Jaber M, Shawahna R. Prevalence of burnout syndrome among anesthesiologists, anesthesia technicians, and intensive care unit nurses in Palestinian hospitals: a cross-sectional study. *BMC Psychiatry.*

- 2024;24(1):740. doi:10.1186/s12888-024-06196-y.
33. Alvares MEM, Thomaz EBAF, Lamy ZC, Nina RVAH, Pereira MUL, Garcia JBS. Burnout syndrome among healthcare professionals in intensive care units: a cross-sectional population-based study. *Rev Bras Ter Intensiva*. 2020;32(2):251-60. doi:10.5935/0103-507x.20200036.
 34. Córdova-Martínez A, Pérez-Valdecantos D, Caballero-García A, Bello HJ, Roche E, Noriega-González D. Relationship between Strength and Professional Quality of Life of Nurses Working Hospital Emergency Departments. *Int J Environ Res Public Health*. 2023;20(3):2052. doi:10.3390/ijerph20032052.
 35. Botha E, Gwin T, Purpora C. The effectiveness of mindfulness based programs in reducing stress experienced by nurses in adult hospital settings: a systematic review of quantitative evidence protocol. *JBI Database Syst Rev Implement Rep*. 2015;13(10):21–9. doi:10.11124/jbisrir-2015-2380.
 36. Alzailai N, Barriball L, Xyrichis A. Burnout and job satisfaction among critical care nurses in Saudi Arabia and their contributing factors: A scoping review. *Nurs Open*. 2021;8(5):2331-44. doi:10.1002/nop2.843.
 37. Bodini L, Bonetto C, Cheli S, Del Piccolo L, Rimondini M, Rossi A, et al. Effectiveness of a Mindful Compassion Care Program in reducing burnout and psychological distress amongst frontline hospital nurses during the COVID-19 pandemic: a study protocol for a randomized controlled trial. *Trials*. 2022;23(1):734. doi:10.1186/s13063-022-06666-2.
 38. Giannetta N, Villa G, Bonetti L, Dionisi S, Pozza A, Rolandi S, et al. Moral Distress Scores of Nurses Working in Intensive Care Units for Adults Using Corley's Scale: A Systematic Review. *Int J Environ Res Public Health*. 2022;19(17):10640. doi:10.3390/ijerph191710640.
 39. Friganović A, Selič P. Where to Look for a Remedy? Burnout Syndrome and its Associations with Coping and Job Satisfaction in Critical Care Nurses-A Cross-Sectional Study. *Int J Environ Res Public Health*. 2021;18(8):4390. doi:10.3390/ijerph18084390.
 40. de Azevedo Bringel JM, Abreu I, Muniz MMC, de Almeida PC, Silva MG. Health Professionals' Chronotype Association with Salivary Cortisol and Occupational Stress in Neonatal Intensive Care Units. *Int J Environ Res Public Health*. 2023;20(9):5683. doi:10.3390/ijerph20095683.