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Best Practices to Reduce Nurse Fatigue in Hospital Intensive and Critical Care Units, Decrease Nurse Turnover, and Improve Quality Care

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Walden University

College of Management and Human Potential

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Alejandra Quinones

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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Best Practices to Reduce Nurse Fatigue in Hospital Intensive and Critical Care Units,
Decrease Nurse Turnover, and Improve Quality Care

by

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Abstract

Nursing is an occupation with extensive duties affecting patient safety and extensive patient practices. The purpose of this integrative review was to search the existing body of knowledge related to intensive care or critical care nurses to assess work hours and other contributors to nurse fatigue and how this relates to quality patient outcomes. The review question explored the best practices to reduce nurse fatigue in intensive care or critical care related to long shifts and other factors and the relationship to patient outcomes. Methods involved thoroughly analyzing current empirical and nonempirical literature to determine themes for answering the review question. The healthy work environment theoretical framework supported these results by identifying how to manage logical support systems through progressive leadership activities. Results of the analysis showed six themes: decreased nurse turnover, healthy environment, teamwork, improved quality care, trustworthy leadership, and effective nursing leadership; there were 13 sub-themes: stress management, job demands, staff education, control/demand issues, reduced overtime, well-being, appropriate staffing, staff meetings, effective communication, motivation, support management, decision-making, and engagement. Conclusions indicated that the predominant best practices for positive social change in order to reduce nurse fatigue on critical care units are an encouraging work culture and nurse engagement in a positive organizational culture that is supported by a proactive corporate management team.

Part 1: Practice-Based Problem

Problem of Interest

The focus of this integrative review concerns the problem of nurse fatigue in intensive and critical care units within urban and rural hospitals. Nurse fatigue in these units may result in staff turnover and quality issues related to patient outcomes (Battle & Temblett, 2018). Many hospital systems experience challenges due to a lack of organizational leadership, resulting in adverse work environments for nurses and the burnout that contributes to low morale, further exacerbating turnover (Battle & Temblett, 2018). Because many nurses experience burnout, fatigue, and poor quality of life, especially when working in intensive and critical care units, healthcare administrators need to consider ways to improve nursing workloads with support, innovative practices, and communication that will result in better work outcomes that also increase retention (Meneguín et al., 2023). This integrative review will determine best practices to reduce nurse fatigue in critical care units (Meneguín et al., 2023).

Healthcare Administration Problem

Background

The healthcare administration problem is nursing fatigue in hospital intensive care units, and the potential for staff turnover and adverse outcomes related to patient quality care (Benzo et al., 2022; Thompson, 2019). Mealer et al. (2016) found that burnout can be related to fatigue due to heavy workloads, long work hours, and understaffing. They studied the burnout syndrome among healthcare professionals, which can lead to post-traumatic stress disorder (PTSD; Mealer et al., 2016). Furthermore, according to Mealer et al. (2016), fatigue among nurses may be related to extremely difficult work conditions

when there is insufficient time-out (Mealer et al., 2016). Additional research is needed to understand ways to educate health service organization administrators about new initiatives to reduce nursing burnout and fatigue that may affect their well-being and patient safety.

Operational Problem

Aljanfawi (2022) studied workload and burnout among nurses in intensive care units and found that nurses have high stress factors that can impact patient care due to workload. These issues result in low nursing morale, which negatively affects the work environment, may increase burnout syndrome, and affect the emotional health of nurses. Anderson (2022) studied nurse retention and patient safety due to poor staffing and found that many hospital nurses are exhausted and burned out due to mental and physical work demands. Both burnout and fatigue are a problem for healthcare administrators and the hospital because it can increase poor quality of patient care and increase errors among nurses. Hospitals are also at risk for decreased Medicare payments due to the possibilities of adverse patient outcomes concerning patient infections, increased length of stay, and the potential for readmissions (CMS, 2022).

Many nurses suffer from burnout, exhaustion, and emotional problems, which can lead to hospital staffing shortages if they leave the organization as a result (American Nurses Foundation, 2021). The results of some studies indicate that 34% of nurses suffer emotional health issues, thus demonstrating there is data concerning the emotional distress of nurses (American Nurses Foundation, 2021). According to the American Nurses Foundation (2021), the percentage of nurses who feel emotionally unhealthy is about 52%, and about 42% of nurses have had some kind of trauma since the COVID-19

pandemic; this number increases to about 68% for critical care nurses (American Nurses Foundation, 2021).

Statistics on nurse burnout are a central problem for healthcare administrators. Shah et al. (2021) studied the prevalence and factors that can lead to nurse fatigue in the United States (U.S.) and found that 418,769 nurses left their jobs in 2017, and about 32% of nurses had burnout. Results also indicated that nurses thinking of leaving their jobs were 676,122, and about 43% indicated this was due to burnout (Shah et al., 2021). Determining best practices to decrease burnout and turnover among critical care nurses requires resolutions within hospital organizations that systematically enhance workflow by focusing on process improvements. The most common reasons given for leaving the workforce were high-risk working conditions (51%), feelings of being overworked or burned out (50%), inadequate staffing (39%), and unsatisfactory safety protocols (37%; Health Resource & Services Administration, 2022).

Ideal State of Operations

The work environment in intensive and critical care units requires healthcare leaders' attention to improve patient quality of care and safety for nursing staff (Wei et al., 2018). The Quick Safety standard to develop resilience to combat nurse burnout is essential in the healthcare system. These standards can include control of work-life balance, education with peers, and help with the coordination of treatment for patients (Joint Commission, 2019). Some areas that concern the impact of nurse resilience are leadership strategies, support from colleagues, and recognizing stressors (Joint Commission, 2019). These actions require nurse leaders and healthcare administrators to

offer team support and organizational support to provide nurses with a sense of accomplishment (Joint Commission, 2019).

Nurses' well-being can be significantly affected by burnout, including nursing deaths by suicide. According to the American Association of Critical-Care Nurses (2023), nurses could be associated with a high risk of suicide. When nurses feel a lack of support from their leaders, an unhealthy work environment, and long work hours, the results may lead to burnout and depression (American Association of Critical-Care Nurses, 2023). According to the American Nurses Association (2015), the importance of nursing practice standards are essential for health care systems to understand and implement to improve how nurses can perform and adapt to high-stress nursing work decisions, patient care, and personal self-care.

According to Gooch and Kayser (2023), the Becker's Hospital Review states that legislation only exists in five states for staffing ratios, and that the ANA is working to change this. New York state now requires that the following in critical care units: "A minimum of one registered professional nurse assigned to care for every two patients that an attending practitioner determines to require intensive or critical care" (NY State Nurses Association, 2023). These standards are important to the care of critical care nurses, and if a patient requires additional care, then one nurse to care for one patient would be the ideal state of operations (Joint Commission, 2019).

Professional Practice Gap Statement

Nurse fatigue is a serious issue for hospital healthcare administrators throughout their organizations and particularly in CCU and ICU units where adverse outcomes for high acuity patients may occur if staffing ratios are not adequate (Benzo et al., 2022;

Thompson, 2019). Intensive care units in New York suffer from 1-3 nurse-to-patient ratios, most on night shifts, which creates a quality care risk for patients on these units (City State New York, 2022). The ideal state of operations recommended by the New York State Nurses Association (2023) and the University of Florida Health (n.d.) is staffing criteria for 24-hours 1:1 and 1:2 nurse-to-patient ratios for Intensive Care Units.

Summary of Evidence

Health service organization administrators are experiencing challenges with nurses' fatigue, work schedules, long shifts, and patient safety issues (James & James, 2023; Peršolja, 2023; Shah et al., 2021). The need to comprehend why organization managers are not generating policies to decrease fatigue among nurses and develop a better work environment is a gap related to nurse turnover (Christianson et al., 2022; Parola et al., 2022). The Joint Commission (2019) also identified the unique and negative nursing behaviors of compassion fatigue and alert fatigue, which may contribute to nursing burnout. The Agency for Healthcare Research and Quality (AHRQ; 2016) and the U.S. Department of Health and Human Services (DHHS; 2016) reported that addressing alert fatigue is a concern in hospitals, and administrators should improve the strategies and best practices to eliminate safety hazards.

Hospital systems may suffer from a deficiency of structural leadership, resulting in unsafe places that harm the patients and nurses (Hooper, 2023). The work environment in hospital systems may benefit from better schedules and safe jobs that address and improve nursing well-being (Hooper, 2023). Healthcare organizations must apply procedures to reduce burnout and the negative results in the healthcare organization for nurses and patients (Khanjani et al., 2021).

Purpose of the Integrative Review

The purpose of this integrative review was to search the existing body of knowledge related to intensive care or critical care nurses to assess work hours and other contributors to nurse fatigue and how this relates to quality patient outcomes. Hospitals are experiencing challenges with adopting strategies to reduce nurse fatigue levels; new strategies to eliminate fatigue are necessary (Paes, 2022; Storm & Chen, 2021 Yu et al., 2019).

Integrative Review Question(s)

What are the best practices to reduce nurse fatigue in intensive care or critical care related to long shifts and other factors and the relationship to patient outcomes? The key elements related to the review question concern nursing turnover, low morale, and patient quality outcomes.

Theoretical Framework

The theoretical framework for this study is the Healthy Work Environment Theoretical Framework. The fundamental constructs of the framework are continuous skilled communication, true collaboration, meaningful recognition, appropriate staffing, and effective decision making (Kester et al., 2021). This relates to this study because of the need to improve work environments and the quality of care in hospitals and the healthcare system (Kester et al., 2021). The purpose of this healthy work environment theoretical framework is to determine and evaluate workplace issues and provide best practices for improving staffing and quality outcomes. Some standards include communication, collaboration, decision-making, appropriate staffing, recognition, and leadership (Manning & Jones, 2021). The model provided by the American Association

of Critical-Care Nurses (2021) further illustrates the standards for a healthy work environment among nurses.

Figure 1

AACN Healthy Work Environment



Note. This framework was produced by Manning & Jones in 2021, summarizing six groups of standards that influence the AACN Healthy of Work Environment.

The fundamental constructs of the framework include the implementation of the vital work environment framework in an intensive care unit (Kester et al., 2021). The Healthy Work Environment Theoretical Framework supports this research because it suggests that addressing staff turnover and retention is necessary. The framework also promotes the intensification of evidence-based performance with decision-making, which is the procedure of making choices and resolutions (Kester et al., 2021). The decision-making helps healthcare administrators with the methods to create solutions based on the

theoretical framework, which provides information related to improving nurses' well-being and patients' safety in the work environment (Kester et al., 2021).

Part 2: Literature Review, Quality Appraisal, and Analysis

Literature Search Strategy

The literature search strategies that include the inclusion and exclusion criteria are essential to help understand the fundamentals of the literature (Remington, 2020).

Integrative reviews can help address the questions found in the literature (Remington, 2020). Databases are the tools to find the literature necessary for the integrative review (Remington, 2020).

The platforms are Google Scholar, PubMed, MEDLINE, ProQuest, CINAHL Plus, ScienceDirect, APA PsycInfo, Gale Academic, Supplemental Index, Science Citation Index Expanded, and Academic Search Complete. The key search words include *best practices nurse fatigue OR intensive care OR critical care, nurses OR nursing, AND best practices well-being OR wellbeing OR well-being, AND best practices job satisfaction OR work satisfaction OR employee satisfaction AND best practices scheduling, OR leadership, and OR morale in critical OR intensive care AND happiness*; the search was limited to peer review OR professional organization, limited to English Language, 2019 to present (Toronto & Remington, 2020).

Table 1*Inclusion and Exclusion Search Criteria*

Inclusion search criteria	Exclusion search criteria
<ul style="list-style-type: none"> • Published in English • The period from 2018 to - 2024 • Intensive care nurses • Critical-Care Nurses • Hospitals • Patient safety • Nurses' safety • Integrative review • Quantitative studies • Qualitative studies • Randomized controlled data • Descriptive studies 	<ul style="list-style-type: none"> • Student Nurses or Educators • Dissertations and Abstracts • Non-Structure Literature • Gender • Level of Education • In a Language Other than English • Published Before 2018 • Opinion Papers • Did Not Include a Nurse • Did Not Contain Key Search Terms • Not Rural or Urban Hospitals • Not Quantitative and Qualitative Studies

Quality Appraisal

Approximately 100 articles were found through a thorough search of the literature. See Appendix B for search terms and search results. A total of 25 articles were integrated for evaluation in Appendix C after the 25 articles were evaluated for quality of evidence using the Johns Hopkins Nursing Evidence-Based Practice Model (JHNEBP; Dang et al., 2022). The tool rated 17 articles as having evidence at Level 2 with some degree of investigator control but lack randomness, and eight articles at Level 3 lack manipulation and descriptive, comparative, or correlational secondary data (Dang et al., 2022). Of the 25 articles chosen for review, four were appraised as high quality, and 21

were appraised as good quality. See Appendix C: Critical Appraisal Result Log for additional aspects of the quality appraisal results.

After the Critical Appraisal was completed, a thematic theme analysis was performed. The 25 studies were analyzed for pull codes to classify the level of accountability and select the six significant themes and 11 sub-themes (Dang et al., 2022). The results of the article evaluation generated the following themes: decreased nurse turnover, healthy environment, teamwork, improved quality care, trustworthy leadership, and effective nursing leadership. The 13 sub-themes are stress management, job demands, staff education, control/demand issues, reduced overtime, well-being, appropriate staffing, staff meetings, effective communication, motivation, support management, decision-making, and engagement (Dang et al., 2022). See Appendix D: DHA Thematic Analysis Results for more details on thematic analysis results.

Thematic Analysis of Literature

Most articles were cross-sectional, descriptive, and experimental designs with surveys or questionnaires. The populations were volunteers in hospital settings. Some biases in the analysis evidence the need for best practices to reduce fatigue among nurses. Many studies lack random data because of some bias in the control of variables (Dang et al., 2022). Most articles had Cronbach's alpha (α) values of 0.7 or higher, an acceptable consistency (Dang et al., 2022). The data were analyzed using the thematic analysis. See Appendix D: DHA Thematic Analysis Results for more details on thematic analysis results.

Table 2*Solutions to Improve Nursing Practices for Critical Care Nurses*

Ideal Solutions	Most Frequently Mentioned to Least Frequently
Appropriate Staffing	Healthy Environment
Effective Nursing Leadership	Decision-Making
Healthy Environment	Well-being of Nurses
Control/Demand	Reduce Nurse Fatigue
Effective Communication	Teamwork
Decrease Nurse Turnover	Effective Communication
Improve Quality Care	Stress-Management
Support Management	Improve Quality Care
Reduce Nurse Fatigue	Reduce Overtime
Stress-Management	Trustworthy Leadership
Trustworthy Leadership	Effective Nursing Leadership
Reduce Overtime	Support Management
Motivation	Appropriate Staffing
Staff Meetings	Motivation
Staff Education	Staff Meetings
Decision-Making	Staff Education
Well-being of Nurses	Decrease Nurse Turnover
Teamwork	Control/Demand
Job Demands	Job Demands

Conclusion

The solutions for better practices of the review were a necessary evaluation to understand the nurse's needs (Toronto & Remington, 2020). By selecting the appropriate articles, the search process resulted in a satisfactory comprehension of the solutions for reducing nurse fatigue in hospital intensive and critical care units, decreasing nurse turnover, and improving quality care (Toronto & Remington, 2020). The most frequently mentioned words in the literature review were healthy environment, decision-making, well-being of nurses, reduced nurse fatigue, teamwork, effective communication, stress management, improved quality care, and reduced overtime.

Part 3: Presentation of Results

Organizational culture has either a positive or negative effect on employees and for intensive and critical care nurses, culture may make a difference in their relationship with the workplace and willingness to remain. For this study, many attributes were examined to determine how to improve the work environment and reduce fatigue for RNs in stressful intensive care positions. These matters are important because there is an increased turnover rate in critical care units, and improving work culture may change how employees adapt to high-stress areas (Aydas et al., 2023; O'Hara et al., 2019; Tamata et al., 2023).

Thematic Map and Themes

A presentation of the IR results is shared in this section, and results are based on the 25 articles chosen for Appendix D, the thematic analysis. The integrative review involved a search of relevant articles and culminated with 80 articles. Twenty-five articles were chosen to be analyzed in Appendix C after completing the Johns Hopkins analysis, and then a further appraisal was performed (Appendix C). A thematic analysis of the 25 articles was completed using Appendix D to determine themes and subthemes that addressed the review question (Appendix D). After all codes were pulled from the 25 articles, six significant themes for reducing nurses' fatigue were assembled, along with 13 sub-themes. The six themes are decreased nurse turnover, healthy environment, teamwork, improved quality care, trustworthy leadership, and effective nursing leadership. The 13 sub-themes are stress management, job demands, staff education, control/demand issues, reduced overtime, well-being, appropriate staffing, staff meetings,

effective communication, motivation, support management, decision-making, and engagement.

After sorting the various themes and subthemes, it was essential to format them into a thematic map, which is in Appendix E. A thematic map is important to this study as the map illustrates how the themes and subthemes interconnect to show relationships for solving the primary problem of nurse fatigue in ICU and CCU units. Nurse fatigue is shown as the central focus on the thematic map with the major themes connecting to nurse fatigue and each other, along with the subthemes that connect throughout. The thematic map not only illustrates the outcomes of this study, but the map is also important for educational purposes when sharing the results (Appendix E).

Results of the Thematic Analysis

A presentation of the IR results is shared in this section, and results are based on the 25 articles chosen for Appendix D, the thematic analysis. The overall results indicated there were six significant themes and thirteen sub-themes. The codes were related to the primary focus of this study, which was the need to reduce nurse fatigue. The variety of the results demonstrates the vastness of organizational culture and the importance of leadership to become fully informed and educated about the impact this has on critical and intensive care nurses (Aiken et al., 2023; Gehri et al., 2023).

Definitions of General Terms

Positive Work Culture and Work Environment: the apparent well-being of staff through communication, support, collaboration, and respect

Positive Organizational Leadership: senior management team, departmental support, effective communication, and encouragement

Teamwork: staff engagement, collaboration, strengthening quality and strategy, skills acknowledgment, and strong relationships

Results of Problem-Solving Themes

Decrease Nurse Turnover - reduce staff turnover, increase employee satisfaction and morale.

- a. *Stress Management* - reducing high-stress levels and improving well-being with resources.
- b. *Job Demands* - organizational results, reduce stress, and personal development.

Healthy Environment - factors that influence job satisfaction, well-being, and performance.

- a. *Staff Education* - ensuring quality patient care, nurses training, learning, and employee relations.
- b. *Control/Demand* - a connection between emotional encouragement, controlling processes, and the capability to impact the nurses' work positively.
- c. *Reduce Overtime* - reduce overtime work hours and improve scheduled work hours for nurses.
- d. *The Well-being of Nurses* - improve nurses' physical, mental, and emotional health at work. Increase environmental satisfaction and encourage nurses' happiness.

Trustworthy Leadership - quality of leadership is characterized by integrity, reliability, and ethics.

- a. *Appropriate Staffing* - link to the healthy work environment with policies and procedures.

- b. *Staff Meeting* - assemble staff to improve patient care, work environment, and institutional policies.

Improve Quality Care - ensure safety, patient quality care, and improvement strategies.

- a. *Adequate communication* - exchanging of information to improve patient care, results, and nurses' well-being.

Teamwork - a collaborative effort of nurses working together to achieve goals.

- a. *Motivation* - safeguarding education and development for nurses.
- b. *Support Management* - administrative support for implementing new ideas and resolving problems with better practices.
- c. *Decision-Making* - control of a self-directed work environment.

Effective Nursing Leadership - ensuring high quality patient care, staff satisfaction, and organizational goals.

- a. *Engagement* - job satisfaction, reduced nurse fatigue, and turnover with improved teamwork.

Interpretation of the Findings

Decrease Nurse Turnover

This term also characterizes how a reduction in turnover provides a stable environment for nurses in which teamwork, communication, and nursing expertise can be enhanced and promoted (Suliman et al., 2020; Wei et al., 2023). Reducing turnover for ICU and CCU nurses promotes a favorable milieu in which collegiality can thrive. Nurse leaders can reduce nurse turnover with motivating activities (shift rounding), stable and appropriate workloads, and opportunities that provide flexible work schedules, which are

essential to all health professionals (Sammut et al., 2021; Suliman et al., 2020). Stress management and job demands are the sub-themes related to decreased nurse turnover.

Stress Management

Tully et al. (2023) discussed the practice of gratitude and appreciation as ways to decrease stress, particularly in areas where there are high-acuity patients. By demonstrating appreciation from nursing management, the trickle-down effect also encourages communication between staff. If staff feel unrecognized for their efforts, then stress is magnified in ways that promote turnover (Tully et al., 2023). When employees begin to leave a work unit, there is an increase in other staff contemplating leaving the organization. Therefore, creating a positive culture of appreciation and gratitude may promote goodwill between staff, form a supportive community, and reduce stress (Dziedzic et al., 2023; Tully et al., 2023).

Job Demands

Bahrami et al. (2023) and Wei et al. (2023) determined that job demands may increase fatigue and stress, leading to turnover, unless interventions alleviate the stress. An effective way to do this is to meet with the nursing staff and determine issues during the workday that need to be resolved. Also, if there are other professions, such as certified nurse's aides, that can perform more of the bedside care activities that address the negative aspects of job demands, then this will be more cost-effective than hiring and training new nurses (Bahrami et al., 2023; Wei et al., 2023).

Healthy Environment

A healthy work environment that improves nurses' health and well-being is essential for organizations and critical care units with high-acuity patients (Seok, 2023).

Effective nursing leadership and communication are central to enhancing a healthy environment, and this requires engagement both individually and as a team to build a cohesive work culture that is positive and supportive (Mabona et al., 2022; Seok, 2023). For a healthy work environment, healthcare organizations must have efficient nursing leadership, effective communication, and successful teamwork through engagement that takes place daily rather than occasionally (Dziedzic et al., 2023). The sub-themes under this important theme are staff education, control/demand, reduced overtime, and the well-being of nurses.

Staff Education

Education benefits can add to the overall satisfaction of nurses and provide incentives that create goodwill and employee loyalty (Bruyneel et al., 2024; Aiken et al., 2023). These feelings can benefit critical care nurses by providing positivity that decreases overall fatigue and boosts good feelings related to the future. In general, individuals often feel fatigued when they are discouraged and feel under-appreciated. When formal or informal education is an option, positive personal experiences can be enhanced (Bruyneel et al., 2024; Aiken et al., 2023).

Control/Demand

Cunningham et al. (2023) explained that having control of one's activities rather than being demanded to perform activities makes the work environment more satisfying and creates a better work relationship between critical care nurses, their patients, and management. Building resilience through communication and engagement can strengthen a nurse's response to stress and reduce the effects of fatigue. When performing tasks and responsibilities under stress, fatigue increases and may be exhausting. Those same tasks,

when performed in an environment where the nurse feels they have control, may not result in fatigue (Andersson et al., 2022; Cunningham et al., 2023)

Reduce Overtime

A healthy work environment is further affected by the need to work predictable hours and not be concerned about being away from family, working when fatigued and exhausted, or experiencing a lack of control over one's time (Unlugedik et al., 2023). Conversely, when nurses experience control because overtime is limited, they can plan more effectively during their time off, which supports a healthy mental and physical outlook. This helps critical care nurses support each other better, and their patients benefit by having nurses who enjoy their work and are better able to provide patient support (Cunningham et al., 2023; Unlugedik et al., 2023).

Well-being of Nurses

The well-being of critical care nurses is directly linked to a healthy work environment and positive organizational culture by promoting the control a nurse has over their work schedule, reducing overtime, and providing education opportunities. These well-being factors will reduce nurse fatigue by promoting a positive work culture that builds resilience and comradery and, according to Dulko et al. (2022), connects physical and mental well-being with their work unit, patients, and organizational relationships. Additionally, these feelings of well-being and reduced fatigue promote organizational loyalty and reduce turnover (Dulko et al., 2022; Novilla et al., 2023; Yang et al., 2023).

Trustworthy Leadership

Reliable healthcare leadership is indispensable for cultivating and maintaining an organization's quality care and job performance. Job satisfaction among nurses can be achieved through trustworthy leadership that emphasizes accountability, transparency, and communication (Mabona, 2022; Sammut et al., 2021). These leadership attributes form the basis for trust that is felt throughout the organization. This creates a positive culture that attracts and retains employees proud to work for the organization (Mabona, 2022). Leadership must intentionally maintain trust, and transparency is vital, as nothing is more disturbing to employees than a lack of honest communication. The sub-themes for leadership are appropriate staffing and staff meetings.

Appropriate Staffing

Staffing is a crucial element associated with nurse fatigue that should be addressed regularly. This is a difficult task as critical care units require nurses who can manage high-acuity patients, and these positions may take time to fill. When staff are stable, nurses are reassured that they can plan their lives when away from work, alleviating stress and fatigue. Cheng et al. (2023) maintained that adequate staffing improves the mental health of nurses while reducing burnout and fatigue. Also, if leadership is trustworthy and provides transparent communication, then nurses will understand that staffing levels may be low sometimes, but efforts will be made to fill positions quickly (Abou Hashish et al., 2023; Cheng et al., 2023).

Staff Meetings

Staff meetings should be held with the same agenda items for nurses who work different shifts and schedules. Brief but frequent meetings will keep staff up to date on

issues that may be affecting their jobs and the hospital. Plus, this is an opportunity to share potential opportunities with everyone on the units, not just a select few. Sharing information with all staff will prevent favoritism and competition rather than a cohesive work group (Abou Hashish et al., 2023; Wei et al., 2023). By having the same agenda information, items are documented, and those unable to attend staff meetings will know what was discussed and can obtain the information at another time. This is important for morale as feelings of positivity reduce stress and fatigue, invigorate, and provide workplace enthusiasm (Abou Hashish et al., 2023).

Improve Quality Care

The connections between the nurse's working environment and the quality of care of patients are essential for the organization's success. Leadership support is vital for the nurses who provide daily care to critically ill patients who will improve with quality care (Bruyneel et al., 2024). The theoretical framework for this integrative review is the Healthy Work Environment Theoretical Framework, which emphasizes that patient safety and staff turnover are relevant to the success of patient care in critical care units (Kester et al., 2021). Many of the attributes in this study are related to the ongoing determinants connecting staff stability with patient safety. A significant component of staff stability is whether nurses feel fatigue and stress, rather than experiencing a positive work environment that promotes well-being (Novilla et al., 2023; Yang et al., 2023). The sub-theme under this significant theme is effective communication.

Effective Communication

Communication is the key to approving nursing, patient satisfaction, and quality care. Communication between nursing leadership, physicians, nurses, ancillary services,

and patients is essential to positive outcomes. This is emphasized in the Healthy Work Environment Theoretical Framework to provide collaboration to enhance patient outcomes and create a positive environment for nursing staff (Kester et al., 2021). These attributes provide meaningfulness to the workplace, increasing professional performance while decreasing job fatigue (Mousazadeh et al., 2019). At the same time, these communication strengths promote professional identity within the critical care unit, which leads to job fulfillment, satisfaction, and organizational loyalty, enhancing the overall well-being of nursing staff (Mousazadeh et al., 2019).

Teamwork

Teamwork is a well-researched theme within nursing studies because it aligns with a positive work environment (Sammur et al., 2021). Effective teamwork is needed to improve a healthy work environment and self-sufficiency among nurses (Andersson et al., 2022). Teamwork is essential for patient care and controlling time limitations for nurses working in a critical care unit. Additionally, many procedures require more than one nurse due to the logistics of IV medication, wound care, and other treatments. Nurses must be willing to manage their day by communicating where and when teamwork will be needed (Mabona et al., 2022; Sammut et al., 2021). The sub-themes under this vital theme are motivation, support management, and decision-making.

Motivation

Mabona et al. (2022) explained that teamwork depends on many types of communication that help workers feel motivated to connect with others. A healthy work environment reduces fatigue and is critical to forming a cohesive unit, and this requires trustworthy communication from senior leaders and other nursing leadership.

Additionally, professional expertise, autonomy, and willingness to share responsibilities are essential and will create job satisfaction. O'Hara et al. (2019) explained that motivation to work as a team improves when nursing management encourages communication and participates in patient care and staff education. Providing positive examples of teamwork motivates nurses to better understand the expectations and rewards of teamwork (Mabona et al., 2022; O'Hara et al., 2019).

Support Management

The sub-theme of support management closely aligns with teamwork in that both require positive communication and leadership from management and communication within the unit's team members. Andersson et al. (2022) described the need for supportive structures within the organization and the work unit. Communication is critical to the outcomes for support management and structures that enable staff to focus on problem-solving with the support of their coworkers and leadership. With this support, staff may feel relaxed about the decisions they need to make, which will affect their fatigue levels (Andersson et al., 2022).

Decision-making

Decision-making is a form of empowerment that encourages staff, in particular, critical care staff, to make decisions on their patient's behalf with the support of their team and management. This problem-solving process will help eliminate compassion fatigue and encourage compassion satisfaction (Abou Hashish et al., 2023; Cheng et al., 2023). By feeling engaged and supported, nurses often report feeling more energized to accomplish their responsibilities and less fatigued at the end of the workday (Abou Hashish et al., 2023; Cheng et al., 2023).

Effective Nursing Leadership

Effective nursing leadership often relates to ethical issues when caring for patients in a critical care unit (Yang et al., 2023). Nurses must be supported when ethical issues occur to avoid patient, nurse, and family stress. Addressing concerns promptly and communicating positively will avoid miscommunication and eliminate blaming individuals rather than establishing a supportive problem-solving avenue of communication (Mabona et al., 2022). If nurses understand that nursing leadership will promote a positive work environment and knowledgeable communication, the results will reduce stress and nurse fatigue (Lovern et al., 2023; Yang et al., 2023). Issues related to leadership also lead to understanding how nursing staff on critical units manage stress depending on age, experience, and personality. Nurses react to stress differently, and leadership, which includes supervisors, managers, and senior managers, need to be sensitive to these issues and offer support that engages the nurses to help them with problem-solving (Novilla et al., 2023). The sub-theme under this significant theme is engagement.

Engagement

Maddigan et al. (2023) explained that organizational support is essential to improve engagement between leadership and staff. Often, organizational leaders engage occasionally by making the communication into an event that may be poorly attended and viewed as dismissive rather than inclusive. Bahrami et al. (2023) and Seok et al. (2023) recommended that nursing leadership engage with staff almost daily to encourage communication, promote relationships, and foster the sharing of potential problems. This engagement is best if nursing leadership alternates who visits the units rather than

sending several nurse leaders simultaneously. This communication will enable effective one-on-one communication that is meaningful even though brief and will build trust over time (Maddigan et al., 2023). With this trust, stress and the resulting fatigue are reduced as nurses understand they are not alone in their goal to give patients their best care while also managing their own needs.

Conclusion

Workplace fatigue in any healthcare job may result in staff turnover and decreased morale. This can have a detrimental effect on staff and patient care due to turnover and absenteeism. Critical care nursing staff are at greater risk of fatigue due to the high acuity patients they attend; however, if an organization tries to focus on nursing issues by improving the culture through strong leadership that addresses issues from the top down and recognizes that teamwork, appropriate staffing, and a focus on structure will motivate employees. The Healthy Work Environment Theoretical Framework provides information about collaboration to enhance patient outcomes and create a positive environment for nursing staff (Kester et al., 2021). By providing options for nurses that will reduce fatigue and instead provide positive energy from their team and nursing leadership, the hospital will better serve their patients and achieve a higher quality of care and stability in critical care units.

Part 4: Recommendation for Professional Practice and Implications for Social Change

Recommendations for Professional Practice

Introduction

Intensive care and critical care unit nurses (ICUs, CCUs) face substantial challenges, including demanding workloads, high patient acuity, and long shifts. These issues frequently contribute to nurse fatigue, adversely affecting patient and nurses' safety (Kester et al., 2021). Nurse fatigue is a complicated phenomenon influenced by many causes, including emotional stress, staff shortages, and unsupportive leadership. Fatigued nurses are more prone to errors, reduced cognitive function, decreased decision-making, and compromised patient safety (Paes, 2022; Storm & Chen, 2021; Yu et al., 2019). Therefore, implementing effective best practices and strategies to reduce nurse fatigue is vital to optimizing patient and nurse safety and quality of care. The information in this section provides recommendations for professional practice, plus attributes of the theoretical framework, and aspects of social determinants of health.

Integrative Review Question

What are the best practices to reduce nurse fatigue in intensive care or critical care related to long shifts and other factors and the relationship to patient outcomes? The critical elements of the review question concern nursing turnover, high workload, and patient quality outcomes.

Positive Work Culture to Reduce Nurse Fatigue

A positive work culture only occurs when an organization, from senior leadership to various levels of management, works intentionally to provide a positive culture. A company's culture consists of many attributes, behaviors, policies, expectations, and

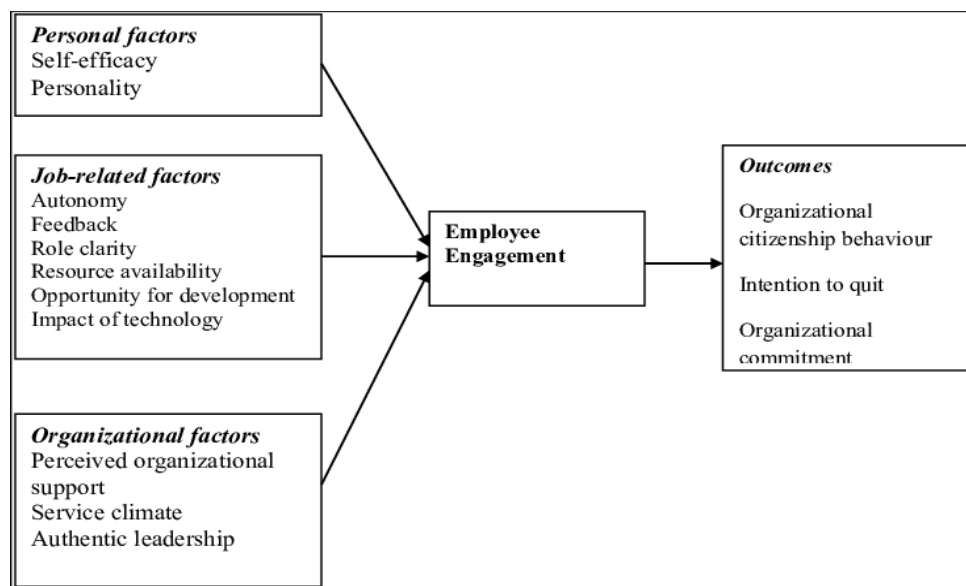
objectives that result in either negativity or positivity; either outcome is pervasive throughout the organization (Dziedzic et al., 2023; Maddigan et al., 2023). For nurses in CCU or ICU units, a positive work culture reduces nurse fatigue, enhances well-being, and promotes engagement by establishing channels for open communication and transparency. Collaborative problem-solving encourages a culture of teamwork that supports nurses and interdisciplinary team members. Involving nurses in decision-making behaviors inspires them to contribute to their professional proficiency (Dziedzic et al., 2023; Maddigan et al., 2023). Offering opportunities for professional growth demonstrates an organization's commitment to empowering the nursing workforce, which improves satisfaction and retention.

Healthy Work Environment Theoretical Framework

The Healthy Work Environment Theoretical Framework provides a guide for exploring the work environment in healthcare settings, which includes assessments and concepts to explain the complicated communications between organizational leaders, nurses' best practices, and patient safety (Kester et al., 2021). The framework emphasizes the need for employee engagement, leading to involvement in decision-making and meaningful recognition (Kester et al., 2021; Manning & Jones, 2021). This decision-making helps healthcare leaders find solutions based on best practices that focus on employees and patients and encourage staff to engage with their peers and managers in ways that promote loyalty to the organization through a healthy work environment. The resulting engagement and loyalty promote retention and satisfaction of all staff, including CCU and ICU nurses (Kester et al., 2021).

Figure 2

The Healthy Work Environment Theoretical Framework with Emphasis on Employee Engagement



Note: Borah & Baru (2018)

The Healthy Work Environment Theoretical Framework relates to the project's six themes: decreased nurse turnover, healthy environment, teamwork, improved quality care, trustworthy leadership, and effective nursing leadership. Nurse engagement and involvement in decision-making leads to sound solutions associated with nurses' well-being and patient safety (Kester et al., 2021). The fundamental constructs of the framework are to enhance the work environment and address challenges, such as fatigue and stress, by providing a structure that promotes continuous quality improvement for patients and staff (Kester et al., 2021).

Stress Management Strategies

Stress is often a consequence of feeling over-worked and unsupported. However, there are ways to address these issues through stress management strategies (Dustmohammadloo et al., 2023). Leaders should be assertive in creating problem-solving techniques to eliminate stress at work and involve nurses in the process. Also, it is essential to improve work performance with stress management plans that help nurses create a positive culture through appreciation and support (Dustmohammadloo et al., 2023). These intentional appreciative behaviors will help staff share goodwill, and consequently, a healthy environment and teamwork will reduce workplace stress.

Staff shortages should not be a surprise if backup plans are thought through and in place when excessive workloads caused by staff shortages occur (American Nurses Foundation, 2021). Planning for future shortages requires guidance emphasizing planning and communications from nurses, leadership, and senior management. These issues will improve well-being, decrease stress, fatigue, and help nurses work in teams that promote goodwill and increase nurse and patient safety (Naegle et al., 2023).

Teamwork and Nurse Engagement

Bahrami et al. (2023) and Dustmohammadloo et al. (2023) explained that addressing nurse fatigue through teamwork and engagement is critical to increasing satisfaction, and this engagement may increase care quality. Collaboration is a crucial component of engagement, and it is recommended that nurses working in a critical care unit develop teamwork skills and communicate with others about time management techniques that will enhance their skills and encourage feelings of success and goodwill (Sammur et al., 2021).

Industry Standards Related to Staffing Ratios

It is vital in healthcare systems to comply with developments to adjust understaffing, reduce turnover rates, and make predictions about job demand and control (Aydas et al., 2023). The standards related to nurse staffing in healthcare settings are essential to ensure that health services organizations support satisfactory staffing levels to meet patient care needs and promote safe and effective care delivery (Aydas et al., 2023).

Nurse staffing ratios specify the most significant number of patients a nurse can safely care for during a shift (University of Florida Health, n.d.). Determining appropriate nurse-to-patient ratios is essential for ensuring that nurses can provide adequate attention and monitoring care to each patient without being overwhelmed by workload demands (Ulrich et al., 2022). Healthcare organizations should have clear nurse recruitment policies and practices to guide staffing results, safeguard compliance with productiveness standards, and encourage transparency and accountability (University of Florida Health, n.d.).

Some federal institutions suggest that the ratio between intensive care and critical care can be 1:2, and that one nurse can be responsible for two patients (World et al., 2024). Many hospitals recommend the ratio of 1:1 for high-risk patients in ICUs (World et al., 2024). Massachusetts has a nurse-patient ratio of 1:1 and 1:2, depending on the patient's medical severity (World Population Review, 2024). California is the first state to establish minimum registered nurse/patient ratios for hospitals. The RN-to-patient staffing ratio in California for intensive care and critical care is 1:2, and if higher than 1:2, penalties can be determined against hospitals (Connecticut et al., 2004). These staffing ratio laws can improve patient care outcomes in health services organizations and

prevent deaths because higher than 1:2 in critical care units is never appropriate (NY State Nurses Assoc, 2023).

Emotional Fatigue Solutions

Gehri et al. (2023) explained that emotional exhaustion and fatigue are often the result of long shifts, shift changes, lack of control over hours worked, and understaffing. If leadership understands the need to improve nurse-to-patient ratios and other staffing elements, then a reduction in emotional exhaustion and fatigue may occur (University of Florida Health, n.d.). Nurses, particularly those working in demanding settings such as intensive and critical care units, often experience fatigue due to the inflexible environment of their jobs (Khanjani et al., 2021; Sikaras et al., 2021). To help address environmental issues, healthcare organizations should encourage various forms of empowerment that encourage staff to improve engagement through problem-solving processes that replace fatigue with enthusiasm.

Healthcare professionals should promote well-being activities and be involved in self-care exercises to reduce emotional fatigue. One avenue for accomplishing this is to offer training and education programs about stress management with strategies to effectively manage and decrease emotional fatigue (D'Aoust et al., 2023). Addressing emotional fatigue among nurses also requires strong connections to leadership at the senior management level and supervision to encourage these behaviors (Dustmohammadloo et al., 2023).

Implications for Social Change

Satisfactory workload management is essential for decreasing disproportionate stress on nurses including maintaining appropriate nurse-to-patient ratios and ensuring

sufficient staffing supportive policies to promote a healthier workplace culture (Christianson et al., 2022; Parola et al., 2022; University of Florida Health, n.d.). Flexible scheduling opportunities and access to mental health resources are essential to foster nurses' awareness of well-being and resilience, eventually reducing fatigue and burnout (Hooper, 2023). Teaching assistance programs can promote and ensure a well-trained nursing workforce (Lovern et al., 2023). Increasing access to nurse educators, particularly nursing programs in workplace culture and leadership, is essential (Lovern et al., 2023). These programs prepare nurses with the necessary skills to effectively manage a work environment, contribute to reducing nurses' fatigue, and improve job satisfaction.

Successful healthcare programs are necessary to improve overall well-being among health professionals, and investment in quality healthcare expands patient access (Lin et al., 2021). Health promotion among nurses also improves patient demands for health services, and these efforts may contribute to healthier communities (Abou et al., 2023).

Administrative Leadership

Administrative direction is essential in executing and supporting plans to reduce fatigue among hospital nurses (Storm & Chen, 2021). Leading organizational leaders requires vision, strategic thinking, and communication skills to drive structural change and adopt a culture of well-being and safety within healthcare organizations (Aiken et al., 2023). Effective organizational leadership promotes a culture of accountability and continuous advancement, where response tools are applied to monitor growth, recognize areas for improvement, and make necessary changes to enhance the efficiency of fatigue reduction (Yang et al., 2023). Administrative leadership is the cornerstone of powerful

social change within healthcare organizations. Promoting nurse well-being through transparency, accountability, and communication will improve quality patient care and build a better work environment for all employees (Tully et al., 2023).

Intensive and Critical Care Support Services

Intensive care and critical care units will benefit from support services to improve quality care and provide healthier work environments. Critical and intensive care support services are vital mechanisms of healthcare systems that deliver particular care to high acuity patients on intensive care units (Bruyneel et al., 2024). These services include specialized interventions supplied by nurses, staffing, and other healthcare professional teams to monitor patient outcomes on critical care units and develop and implement care plans (Wei et al., 2018). Nurses advocate for patient safety, and these services form a comprehensive framework for delivering high-quality care to critically ill patients by focusing on saving lives (Wei et al., 2018).

Connections between Positive Culture and Quality Outcomes

The connection between major themes and sub-themes in the literature review and the outcomes of improving nursing work culture connect to nurse satisfaction and improvements in patient outcomes (The Joint Commission, 2019). A progressive organizational culture within healthcare settings can be connected to enhanced patient results and patient safety (AHRQ, 2019). In a healthcare organization, various factors can contribute to a supportive and empowering work environment for healthcare professionals, which, in turn, translates into better patient care.

Additionally, a positive culture encourages an emphasis on continuous improvement and education. Healthcare organizations provide staff training, professional

development, and quality improvement plans, encouraging employees to stay informed on best practices and evidence-based policies (Meneguín et al., 2023). Teamwork can build an environment that encourages excellence in patient care and improves outcomes for individuals and communities (Andersson et al., 2022).

Social Determinants of Health and Work Culture

Social determinants of health include various components both within and outside the healthcare system that can influence nurses' well-being, health outcomes, and community connections. Work culture includes numerous characteristics, including organizational strategies such as complying with standards, policies, and work-life balance practices, which can influence staff's health and well-being (Joint Commission, 2019). These strategies improve employees' physical health, morale, productivity, and job satisfaction. Organizations can create healthier, more flexible workplaces that benefit employees and the healthcare organization with an optimistic work culture that reaches into the community and supports patients and families, provides access to care, and provides progression opportunities (Joint Commission, 2019).

Addressing social determinants of health within healthcare work environments, education systems, and healthcare access is critical for mitigating nurse fatigue and promoting overall well-being. By implementing strategies to support workload management, enhance education access and quality, and improve healthcare access, healthcare organizations can create healthier and more sustainable nursing environments, which also translates into healthier communities.

Limitations

This integrative literature review concentrated on best practices to reduce nurse fatigue in hospital intensive and critical care units, decrease nurse turnover, and improve quality care. A limitation concerned the need to investigate other demographic and socioeconomic topics to determine differences concerning nurse fatigue on critical care units. It is important to continue evaluating how to reduce nurse fatigue through best practices that motivate and reduce nurses' intention to leave their jobs. Limitations also include the scope of this integrative review study, which included a reliance on published articles, whereas future studies may benefit from a qualitative study.

Conclusion

Determining best practices is a positive outcome for nurses' well-being that directly influences patient outcomes in the intensive and critical units. By reducing nurse fatigue, healthcare organizations can enhance patient safety, improve the quality of care, and mitigate the risk of adverse events such as medication errors (The Joint Commission, 2019). Additionally, well-being and alertness allow nurses to communicate effectively with leaders, teams, and patients for a comprehensive care delivery. This project demonstrates that many of the themes discussed point toward improving the engagement of nurses in a positive organizational culture that is supported by a proactive corporate management team.

Figure 3

Best Practices to Reduce Nurse Fatigue and Improve Quality Care



The predominant best practices are that a positive work culture and nurse engagement on critical care units are the result of multiple factors that lead to these outcomes. The Healthy Work Environment Theoretical Framework supports these factors and forms a structure that identifies how to manage logical systems through progressive leadership activities. Additionally, the need to provide appropriate nurse/patient ratios is essential to achieving best practices. These best practices align with the social determinants of health because a positive work culture in critical care units and throughout a healthcare organization creates a workforce that benefits the community.

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Appendix A: DHA Practice-Based Problem Literature Review Matrix

Author/ date	Theoretical/ conceptual framework	Research question(s)/ hypotheses	Methodology	Analysis & results	Conclusions	Implications for future research	Implications for practice	Empirical research? (Yes or No)
Battle, C., & Temblett, P. (2018)	Maslach Burnout Inventory	This study aimed to investigate the impact of the introduction of 12-h critical care nursing shifts on healthcare provider and patient care outcomes.	Quantitative	Burnout is a problem in critical care and intensive care unit staff.	Hospital systems are experiencing challenges with a lack of organizational leadership within working environments for nurses that results in burnout in nurses.	Healthcare administrator s must conduct more research to manage workloads and communicati on between physicians and nurses.	Healthcare administrators will improve nurses' workloads and the communicatio n among nurses and other healthcare providers to reduce burnout.	Yes
Meneguim, S., Ignácio, I., Pollo, C. F., Honório, H. M., Patini, M. S. G., & de Oliveira, C. (2023)	WHOQOL- Bref and Oldenburg Burnout Inventory	HSOs are concerned about nurse burnout across their healthcare Intensive care units during and after the COVID-19 pandemic.	Quantitative	The nurses had burnout syndrome and poor quality of life.	Hospital systems face burnout in nurses' staff at intensive care units during and after the coronavirus pandemic.	Healthcare administrator s must conduct more investigations to improve the quality of life among nurses in intensive care units.	Healthcare administrators will develop a plan for nurse burnout by implementing solutions to reduce and eliminate this issue.	Yes

Author/ date	Theoretical/ conceptual framework	Research question(s)/ hypotheses	Methodology	Analysis & results	Conclusions	Implications for future research	Implications for practice	Empirical research? (Yes or No)
Benzo, R. M., Farag, A., Whitaker, K. M., Xiao, Q., & Carr, L. J. (2022)	Compassion Fatigue Model of Figley's	Is there a correlation between nurses' fatigue, long hours, and overtime shifts?	Quantitative	Nurse fatigue among nurses, especially working twelve-hour shifts and overtime, has been a problem in the healthcare system for executives because nurses' fatigue can result in patient safety issues, nurses' performance, and adverse negative patient outcomes.	Fatigue is frequent among nurses and can risk nurses' work. The 12-hour shift probably causes burnout. They showed that nurses who work long shifts could increase burnout probabilities.	Added research is needed to comprehend why healthcare systems are not wealthy in the nurses' shifts to reduce fatigue.	Healthcare leaders will change nurses' schedules positively, and reduced long hours shifts will progress patient results.	Yes
Mealer, M., Moss, M., Good, V., Gozal, D., Kleinpell, R., & Sessler, C. (2016)	Maslach Burnout Inventory (MBI-HS)	Is nurses' burnout associated with understaffing?	Survey	The Maslach Burnout Inventory (MBI-HS) can measure burnout syndrome. They found that burnout can be related to	Fatigue among nurses can be part of extreme work and patients' continuing care without sufficient time-out (Mealer et al., 2016).	Additional research is needed to understand why Health Services Organizations are not educating the healthcare	Hospitals should assist nurses in labor to reduce the nurse's burnout.	Yes

Author/ date	Theoretical/ conceptual framework	Research question(s)/ hypotheses	Methodology	Analysis & results	Conclusions	Implications for future research	Implications for practice	Empirical research? (Yes or No)
				fatigue due to heavy workloads and understaffing. The study because it established the effects of burnout syndrome among healthcare professionals that can result from post-traumatic stress disorder (PTSD) (Mealer et al., 2016).	Healthcare professionals, especially nurses, can have stress due to substantial workloads (Mealer et al., 2016).	leaders in creating new initiatives to reduce burnout among nurses.		
Christianson, J., Johnson, N., Nelson, A., & Singh, M. (2022)	Jobs Demands Resources Model	Why do you want to remain with your work as a nurse?	Survey	Christianson et al. (2022) studied work-related burnout and fatigue during the COVID-19 Pandemic. They found that compassion fatigue and burnout can affect nurses' work. This	The literature review for this study focused on the concepts of 12-hour shifts, overtime, and fatigue. This study aimed to explain the relationship between the conceptions and the model,	Healthcare administrators must evaluate more to comprehend why Health Services Organizations are not generating policies to decrease fatigue	Healthcare leads will improve the procedures to decrease nurses' fatigue. Healthcare administrators are crucial to developing strategies that reduce the adverse	Yes

Author/ date	Theoretical/ conceptual framework	Research question(s)/ hypotheses	Methodology	Analysis & results	Conclusions	Implications for future research	Implications for practice	Empirical research? (Yes or No)
				research is vital for my investigation because of the possible adverse effects of nurses working with burnout and fatigue that can result in rather than a consequence in the nurse's intention to leave their profession.	particularly between fatigue among nurses, twelve-hour shifts, and overtime. Work-related burnout and fatigue during the COVID-19 Pandemic are possible negative consequences of nurses working with burnout and fatigue that can result in rather than a consequence in the nurse's intention to leave their profession (Christianson et al., 2022).	among nurses.	effects of nurses working with fatigue that have poor patient outcomes.	
Jacobs, J. (2021, July 29)	Brief Fatigue Inventory (BFI)	HSOs have difficulty implementing strategies to decrease the 12-hour shifts	Survey	Jacobs (2021) studied that nurses experience fatigue due to working long hours. Jacob	Work-related fatigue impacts the nurse's well-being and the patient's safety (Jacobs, 2021). Fatigue	Health Services Organizations need more evaluation to decrease the 12-hour shifts	Healthcare Organizations should assist in the work schedules to improve the nurses' fatigue	Yes

Author/ date	Theoretical/ conceptual framework	Research question(s)/ hypotheses	Methodology	Analysis & results	Conclusions	Implications for future research	Implications for practice	Empirical research? (Yes or No)
		and eliminate nurse fatigue.		found that 12- hour shifts can increase nurses' fatigue through their shifts if they do not have sufficient recovery between shifts. This study is vital for my research because health service organizations can work to help nurses reduce their work schedules to minimize fatigue levels.	levels among nurses result from long work schedules and insufficient recovery (Jacobs, 2021).	and overtime to help the nurses recover from their duties.	during work and reduce medical errors.	

Appendix B: DHA Review Question Search Log

Database or location name	Search terms	Results	Notes
Google Scholar	Best practices nurse fatigue OR intensive care OR critical care, nurses OR nursing, AND best practices well-being OR wellbeing OR well-being, AND best practices Job Satisfaction OR Work satisfaction OR employee satisfaction AND best practices scheduling, OR leadership, OR morale in critical OR intensive care AND Happiness; limited to peer review OR professional organization, limited to English Language, 2019 to present	33	Likely limited
MEDLINE and PubMed	Best practices nurse fatigue OR intensive care OR critical care, nurses OR nursing, AND best practices well-being OR wellbeing OR well-being, AND best practices Job Satisfaction OR Work satisfaction OR employee satisfaction AND best practices scheduling, OR leadership, OR morale in critical OR intensive care AND Happiness; limited to peer review OR professional organization, limited to English Language, 2019 to present	10	Maybe narrow it down?
ProQuest, CINAHL Plus, ScienceDirect, APA PsycInfo, Gale Academic, Supplemental Index, Science Citation Index Expanded and Academic Search Complete	Best practices nurse fatigue OR intensive care OR critical care, nurses OR nursing, AND best practices well-being OR wellbeing OR well-being, AND best practices Job Satisfaction OR Work satisfaction OR employee satisfaction AND best practices scheduling, OR leadership, OR morale in critical OR intensive care AND Happiness; limited to peer review OR professional organization, limited to English Language, 2019 to present	37	Possibly limited
Google Scholar	Best practices nurse fatigue OR intensive care OR critical care, nurses OR nursing, AND best practices well-being OR wellbeing OR well-being, AND best practices Job Satisfaction OR Work satisfaction OR employee satisfaction AND best practices scheduling, OR leadership, OR morale in critical OR intensive care AND Happiness; limited to peer review OR professional organization, limited to English Language, 2019 to present	33	Likely limited
MEDLINE and PubMed	Best practices nurse fatigue OR intensive care OR critical care, nurses OR nursing, AND best practices well-being OR wellbeing OR well-being, AND best practices Job Satisfaction OR Work satisfaction OR employee satisfaction AND best practices scheduling, OR leadership, OR morale in critical OR intensive care AND Happiness; limited to peer review OR professional organization, limited to English Language, 2019 to present	10	Maybe narrow it down?
ProQuest, CINAHL Plus, ScienceDirect, APA PsycInfo, Gale	Best practices nurse fatigue OR intensive care OR critical care, nurses OR nursing, AND best practices well-being OR wellbeing OR well-being, AND best	37	Possibly limited

Database or location name	Search terms	Results	Notes
Academic, Supplemental Index, Science Citation Index Expanded and Academic Search Complete	practices Job Satisfaction OR Work satisfaction OR employee satisfaction AND best practices scheduling, OR leadership, OR morale in critical OR intensive care AND Happiness; limited to peer review OR professional organization, limited to English Language, 2019 to present		
Google Scholar	Best practices nurse fatigue OR intensive care OR critical care, nurses OR nursing, AND best practices well-being OR wellbeing OR well-being, AND best practices Job Satisfaction OR Work satisfaction OR employee satisfaction AND best practices scheduling, OR leadership, OR morale in critical OR intensive care AND Happiness; limited to peer review OR professional organization, limited to English Language, 2019 to present	33	Likely limited
MEDLINE and PubMed	Best practices nurse fatigue OR intensive care OR critical care, nurses OR nursing, AND best practices well-being OR wellbeing OR well-being, AND best practices Job Satisfaction OR Work satisfaction OR employee satisfaction AND best practices scheduling, OR leadership, OR morale in critical OR intensive care AND Happiness; limited to peer review OR professional organization, limited to English Language, 2019 to present	10	Maybe narrow it down?
ProQuest, CINAHL Plus, ScienceDirect, APA PsycInfo, Gale Academic, Supplemental Index, Science Citation Index Expanded and Academic Search Complete	Best practices nurse fatigue OR intensive care OR critical care, nurses OR nursing, AND best practices well-being OR wellbeing OR well-being, AND best practices Job Satisfaction OR Work satisfaction OR employee satisfaction AND best practices scheduling, OR leadership, OR morale in critical OR intensive care AND Happiness; limited to peer review OR professional organization, limited to English Language, 2019 to present	37	Possibly limited

Appendix C: DHA Appraisal Results Log

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
Maddigan, J., Brennan, M., McNaughton, K., White, G., & Snow, N. (2023). The Prevalence and Predictors of Compassion Satisfaction, Burnout and Secondary Traumatic Stress in Registered Nurses in an Eastern Canadian Province: A Cross-Sectional Study.	Level II and High Quality	Hospital	The study reported moderate compassion satisfaction, burnout, and secondary traumatic stress. The strongest predictor, satisfaction with one's current job, predicted high compassion satisfaction and lower burnout and secondary stress. The subgroup analysis identified hospital nurses as having the most work-related stress and the lowest level of compassion satisfaction.	The scale measured the prevalence of three work-life indicators. Descriptive with self-report survey	The causal relationship was not addressed in the study. This study had a bias in the results.
Wei, H., Horsley, L., Cao, Y., Haddad, L. M., Hall, K. C., Robinson, R., Powers, M., & Anderson, D. G. (2023). The associations among nurse work engagement, job satisfaction, quality of care, and intent to	Level II and High Quality	Healthcare Organization	This study shows that nurses' work engagement is associated with job satisfaction, perceived quality of care, and intent to leave. Nurses' work engagement in this study is lower than in other studies, especially before the COVID-19 pandemic, which may	Quantitative descriptive cross-section design. The Utrecht Work Engagement Scale	The nurses' work engagement in the study was lower compared with other studies.

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
leave: A national survey in the United States.			indicate a possible association with the COVID-19 impact. Because nurses' work engagement is significantly associated with job satisfaction, nurse leaders must find ways to promote nurses' job satisfaction and retention.		
Sammut, R., Briffa, B., & Curtis, E. A. (2021). Distributed leadership and nurses' job satisfaction: a survey.	Level II and Good Quality	Hospital	Nurses 176 reported moderate observed disseminated leadership and job satisfaction. Team leadership can have an optimistic result on the job satisfaction of nurses. Indeed, effective leadership is vital to improving work behavior and quality care for patients and nurses. The response rate was 50%.	A descriptive, cross-sectional survey design and questionnaires.	This study has limitations in the descriptive and cross-sectional survey.
Seok, Y., Cho, Y., Kim, N., Suh, E. E., Martínez-Sabater, A., Chover-Sierra, E., & Saus-Ortega, C. (2023). Degree of Alarm Fatigue and Mental Workload of	Level II and Good Quality	Hospital ICU	Alarm fatigue in ICU nurses (N= 90). The study has studied the relationship between alarm fatigue and mental workload to inform patient safety. About 82 % of nurses reported	Alarm fatigue Measurement in ICU nurses	The results need more information, and more studies are necessary to evaluate alarm fatigue among nurses.

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
Hospital Nurses in Intensive Care Units.			alarm fatigue because of an event error. The nurses' work behavior can affect the safety and well-being of their patients. More studies are necessary to evaluate the alarm and mental workload.		
Bruyneel, A., Bouckaert, N., Pirson, M., Sermeus, W., & Van den Heede, K. (2024). Unfinished nursing care in intensive care units and the mediating role of the association between nurse working environment, and quality of care and nurses' wellbeing.	Level II and Good Quality	Nurses in ICU	A total of 2,183 nurses. Nurses have a risk of burnout and lower perceived quality of care. The study shows that nurses in the ICU had more difficulties in their jobs during the COVID-19. The adequate nursing staff is vital to reducing burnout among nurses. ICU nurses are at risk of unsafety and poor quality of work.	The Practice Environment Scale of Nursing Work Index	Cross-sectional studies lack some significant findings and results that need more research.

Appendix D: DHA Thematic Analysis Results

Author(s) and date	Data Extracted	Initial Codes	Preliminary Themes
<p>Wei, H., Horsley, L., Cao, Y., Haddad, L. M., Hall, K. C., Robinson, R., Powers, M., & Anderson, D. G. (2023). The associations among nurse work engagement, job satisfaction, quality of care, and intent to leave: A national survey in the United States.</p>	<p>Nurses' work engagement, job satisfaction, the association with perceived quality of care, and the intent to leave.</p> <p>Job satisfaction is closely related to work engagement.</p> <p>Heedful relating minimizes intention to leave due to nurse job satisfaction.</p> <p>Valued quality of care is positively associated with heedfulness and negatively associated with intent to leave.</p> <p>Recognized organizational support is positively associated with heedful relating and thriving in nurses' work engagement.</p>	<p>Nurses' work engagement -> job satisfaction.</p> <p>Nurses' work engagement -> Job satisfaction-></p> <p>Effective Organizational support -> job satisfaction</p>	<p>Nurses' work engagement -> job satisfaction.</p> <p>Nurses' work engagement -> Job satisfaction-></p> <p>Effective Organizational support -> job satisfaction</p>
<p>Sammut, R., Briffa, B., & Curtis, E. A. (2021). Distributed leadership and nurses' job satisfaction: a survey.</p>	<p>Heedful team leadership is positively associated with job satisfaction in nurses.</p> <p>Perceived effective leadership -> support and organizational commitment -> nurses' job satisfaction.</p>	<p>Organizational leadership -> job satisfaction -> motivation and leadership</p> <p>Organizational leadership -> Organizational commitment -> job satisfaction -> improved retention -></p>	<p>Organizational leadership -> job satisfaction -> motivation and leadership</p> <p>Organizational leadership -> Organizational commitment -> job satisfaction -> improved retention -></p>

Author(s) and date	Data Extracted	Initial Codes	Preliminary Themes
<p>Bruyneel, A., Bouckaert, N., Pirson, M., Sermeus, W., & Van den Heede, K. (2024). Unfinished nursing care in intensive care units and the mediating role of the association between nurse working environment, and quality of care and nurses' wellbeing.</p>	<p>Perceived effective hospital nurse working environment positively associated with nurses' well-being.</p> <p>Recognized leaders' support is positively associated with quality care.</p>	<p>Nurse work environment -> quality of care</p> <p>Effective Organizational leadership -> Perceived quality -> patient safety -> nurse well-being -></p>	<p>Nurse work environment -> quality of care</p> <p>Effective Organizational leadership -> Perceived quality -> patient safety -> nurse well-being -></p>
<p>Gehri, B., Bachnick, S., Schwendimann, R., & Simon, M. (2023). Work-schedule Management in psychiatric hospitals and its associations with nurses' emotional exhaustion and intention to leave: A cross-sectional multicenter study.</p>	<p>Perceived organizational support -> work engagement versus nurses' emotional exhaustion.</p> <p>Perceived overtime among nurses -> helplessness and intentions to leave.</p> <p>Emotional exhaustion has a relationship with overtime shifts.</p> <p>Work schedule control and shift changes are part of an organization's problem-solving.</p>	<p>Effective Organization support Nurses Work engagement -></p> <p>Effective Organizational problem solving -> Reductions in overtime -> Work schedule control -> Shift change control -></p>	<p>Effective Organization support Nurses Work engagement -></p> <p>Effective Organizational problem solving -> Reductions in overtime -> Work schedule control -> Shift change control</p>
<p>Aiken, L. H., McHugh, M. D., Cleary, M., Ley, C., Borchardt, C. J., Brant, J. M., Turner, B. L., Leimberger, A. E., Waterman, K., Coleman, B. L., Albert, N. M., Stewart, C., Steele, D., Kaplow, R., Kaminsky, K., Hinkle, H. A., Besa, R. D.,</p>	<p>Heedful team leadership is positively related to physical health and negatively associated with nurse burnout due to high turnovers.</p> <p>Efforts from the healthcare system are positively related to high-quality patient care and negatively associated with patient and staff safety.</p>	<p>Positive Team leadership-> Good physical health Reduced burnout Reduced turnover</p> <p>Effective organization leadership-> High-quality patient care High quality patient and staff safety</p>	<p>Positive Team leadership-> Good physical health Reduced burnout Reduced turnover</p> <p>Effective organization leadership-> High-quality patient care High quality patient and staff safety</p>

Author(s) and date	Data Extracted	Initial Codes	Preliminary Themes
Taylor, K. P., Graboso, R., ... Aiken, L. H. (2023). Emergency Nurses' Well-Being in Magnet Hospitals and Recommendations for Improvements in Work Environments: A Multicenter Cross-Sectional Observational Study.			
Mabona JF, van Rooyen D, Ten Ham-Baloyi W. (2022 Apr 25). Best practice recommendations for healthy work environments for nurses: An integrative literature review.	<p>The heedful, healthy work environment for nurses requires leadership, effective communication, teamwork, and professional autonomy.</p> <p>Effective nursing leadership and communication are central to enhancing a healthy environment.</p> <p>Effective teamwork is integral to a healthy work environment and the need for professional autonomy.</p>	<p>Effective nursing leadership -> Constructive communication -> Good healthy environment</p> <p>Successful teamwork-> Good organizational practice Participatory decision-making</p>	<p>Effective nursing leadership ->Constructive communication _> Good healthy environment Successful teamwork-> Good organizational practice Participatory decision-making</p> <p>Effective Organizational support -> job satisfaction</p>
Mousazadeh, S., Yektatalab, S., Momennasa, M., Parvizi, S. (2019). Job Satisfaction Challenges of Nurses In The Intensive Care Unit: A Qualitative Study.	<p>Meaningfulness in job satisfaction of nurses and challenging in job satisfaction promotion.</p> <p>Perceived nursing education, professional performance, and professional identity.</p>	<p>Effective Organizational support -> job satisfaction</p> <p>Perceived Organizational support-> Heedful resources Positive nursing education-> Professional performance Professional identity</p>	<p>Perceived Organizational support-> Heedful resources Positive nursing education-> Professional performance Professional identity Organizational leadership -> job satisfaction -></p>
O'Hara, M. A., Burke, D., Ditomassi, M., & Palan Lopez, R. (2019). Assessment of Millennial Nurses' Job Satisfaction	<p>Organizational leadership is essential to help with job satisfaction among nurses.</p> <p>Recognized nurses' labor is considerably positively related to job satisfaction. Effective nurse managers</p>	<p>Organizational leadership -> job satisfaction -></p> <p>Effective nurse managers -> improve job happiness -></p>	<p>Effective nurse managers -> improve job happiness -> improve retention -></p>

Author(s) and date	Data Extracted	Initial Codes	Preliminary Themes
and Professional Practice Environment.	must find methods to improve job happiness and retention. Positive practice environment -> job satisfaction	improve retention -> Positive practice environment -> job satisfaction	Positive practice environment -> job satisfaction Organizational approaches to support nurse transition -> engaging and retaining nurses.
Dulko, D., & Kohal, B. J. (2022). How Do We Reduce Burnout In Nursing?	Nurses' physical and mental well-being are related to the leadership of the nursing workforce. The organizational environment has a relationship with nurse burnout. Organizational approaches to support nurse transition -> engaging and retaining nurses. Heedful nurses programs for better the nurses' well-being and improve nurses' retention.	Organizational approaches to support nurse transition -> engaging and retaining nurses. Positive nurses' leadership-> Physical and mental well-being Reduced burnout	Positive nurses' leadership-> Physical and mental well-being Reduced burnout Nursing leaders -> executive coaching -> practical resilience work Organizational -> strengthening resilience of nurses -> work environment
Cunningham, T., Caza, B., Hayes, R., Leake, S., & Cipriano, P. (2023). Design health care systems to protect resilience in nursing.	Recognize nurse turnover and resignations in the healthcare workforce. Healthcare organizations -> improve the resilience of nurses -> policies and standards -> work environment. Heedful in recognition of the investment in the nursing workforce.	Nursing leaders -> executive coaching -> practical resilience work Organizational -> strengthening resilience of nurses -> work environment	Healthcare organizations problem solving-> supportive structures -> leadership Increase communication -> nurses, physicians, patients, and families
Andersson, M., Nordin, A., & Engström, Å. (2022). Critical care nurses' perception of moral distress in intensive care during the COVID-19 pandemic – A pilot study.	Healthcare organizations need to create supportive structures and leadership to solve problems. Increase communication involving nurses, physicians, patients, and families.	Healthcare organizations problem solving-> supportive structures -> leadership Increase communication -> nurses, physicians, patients, and families	

Author(s) and date	Data Extracted	Initial Codes	Preliminary Themes
Ünlügedik, M., & Akbaş, E. (2023). The effect of spiritual well-being on compassion fatigue among intensive care nurses: A descriptive study.	<p>The healthcare organization management -> develop policies -> eliminate compassion fatigue in nurses.</p> <p>Perceived organizational support is positively associated with improved nurses' well-being.</p> <p>Spiritual well-being -> environments less stressful and less challenging.</p>	<p>Spiritual well-being -> environments- > less stressful and less challenging</p> <p>Nurse work environment -> promoting spiritual well-being</p>	<p>Spiritual well-being -> environments- > less stressful and less challenging</p> <p>Nurse work environment -> promoting spiritual well-being</p> <p>Promote well-being -> reduce burnout</p>
Lovern, A., Quinlan, L., Brogdon, S., Rabe, C., & Bonanno, L. S. (2023). Strategies to promote nurse educator well-being and prevent burnout: An integrative review.	<p>Being mindful of promoting well-being among nurses is essential to eliminate burnout.</p> <p>Healthcare organizations are increasing strategies for well-being and diminishing burnout.</p>	<p>Promote well-being -> reduce burnout</p> <p>Workplace wellness interventions -></p> <p>Improve well-being -> Decrease burnout</p>	<p>Workplace wellness interventions -></p> <p>Improve well-being -> Decrease burnout</p> <p>Effective Organizations support fewer hours nursing shifts-></p>
Aydas, O. T., Ross, A. D., Scanlon, M. C., & Aydas, B. (2023). Short-Term nurse schedule adjustments under dynamic patient demand.	<p>Perceived effective Management of short-term nurse schedule.</p> <p>Organizational support fewer hours nursing shifts-> Nurse supervisor improve nurses' schedules</p>	<p>Effective Organizations support fewer hours nursing shifts-></p> <p>Nurse supervisors improve nurses schedules -> short-term nurses' schedule</p>	<p>Nurse supervisors improve nurses schedules -> short-term nurses' schedule</p> <p>Professional growth and development -> Job satisfaction</p>
Tamata, A. T., & Mohammadnezhad, M. (2023). A systematic review study on the factors affecting shortage of nursing workforce in the hospitals.	<p>Good leadership -> effective quality care -> improving the efficiency of the health system</p> <p>Nurses experience flexibility in work hours.</p>	<p>Professional growth and development -> Job satisfaction</p> <p>Leadership support -> work environment factors</p>	<p>Leadership support -> work environment factors</p>

Author(s) and date	Data Extracted	Initial Codes	Preliminary Themes
<p>Yang, Q., Zheng, Z., Pang, S., Wu, Y., Liu, J., Zhang, J., Qiu, X., Huang, Y., Xu, J., & Xie, L. (2023). Clinical nurse adherence to professional ethics: A grounded theory.</p>	<p>Perceived improvement in the quality of care for nurses and patients.</p> <p>Effective nursing leadership in nurses' adherence to ethics.</p> <p>Perceived increase patient satisfaction -> nurses-patient relationships</p>	<p>Personal growth -> social support system -> self-harmony</p> <p>Nursing staff -> nursing ethics and personal morals</p>	<p>Personal growth -> social support system -> self-harmony</p> <p>Nursing staff -> nursing ethics and personal morals</p>
<p>Suliman, M., Almansi, S., Mrayyan, M., ALBashtawy, M., & Aljezawi, M. (2020). Effect of nurse managers' leadership styles on predicted nurse turnover.</p>	<p>Effect of nurse managers' leadership styles in job satisfaction.</p> <p>Leadership can improve nurses' job satisfaction and decrease nurse turnover.</p>	<p>Nurses' job satisfaction -> decrease nurse turnover</p> <p>Effect of Nurse Managers' -> leadership styles</p>	<p>Nurses' job satisfaction -> decrease nurse turnover</p> <p>Effect of Nurse Managers' -> leadership styles</p>
<p>Tully, S., Tao, H., Johnson, M., Lebron, M., Land, T., Armendariz, L. (September 24, 2023). "Gratitude Practice to Decrease Stress and Burnout in Acute-Care Health Professionals"</p>	<p>Effective of work stress and burnout quality patient care and job satisfaction</p> <p>Reduce work-related stress and burnout in healthcare organizations</p>	<p>Work stress and burnout -> Quality patient care and job satisfaction</p> <p>Decreased work-related -> stress and burnout</p>	<p>Work stress and burnout -> Quality patient care and job satisfaction</p> <p>Decreased work-related -> stress and burnout</p>
<p>Dziedzic, B., Jagiełło, M., Kobos, E., Sienkiewicz, Z., & Czyżewski, Ł. (2023). Job satisfaction among nurses working in hospitals during the COVID-19 pandemic.</p>	<p>Job satisfaction is vital for healthcare organizations to have a good work environment.</p> <p>Nurses' leadership improves the lack of job satisfaction.</p> <p>Organizational work efficiency to reduce burnout.</p>	<p>Good work environment -> Job satisfaction</p> <p>Nurses' leadership improves -> job satisfaction</p> <p>Organizational work efficiency -> reduce burnout</p>	<p>Good work environment -> Job satisfaction</p> <p>Nurses' leadership improves -> job satisfaction</p> <p>Organizational work efficiency -> reduce burnout</p>

Author(s) and date	Data Extracted	Initial Codes	Preliminary Themes
<p>Novilla, M. L. B., Moxley, V. B. A., Hanson, C. L., Redelfs, A. H., Glenn, J., Donoso Naranjo, P. G., Smith, J. M. S., Novilla, L. K. B., Stone, S., & Lafitaga, R. (2023). COVID-19 and Psychosocial Well-Being: Did COVID-19 Worsen U.S. Frontline Healthcare Workers' Burnout, Anxiety, and Depression?</p>	<p>Nurses' work engagement is significantly associated with job satisfaction. Nurse leaders must find ways to promote job satisfaction and retention.</p> <p>The review of policies can positively impact the nurse's well-being.</p>	<p>Nurses' work engagement -> job satisfaction -> nurse leaders -> retention</p> <p>Review of policies -> nurses' well-being</p>	<p>Nurses' work engagement -> job satisfaction -> nurse leaders -> retention</p> <p>Review of policies -> nurses' well-being</p>
<p>Maddigan, J., Brennan, M., McNaughton, K., White, G., Snow, N. (2023). The Prevalence and Predictors of Compassion Satisfaction, Burnout and Secondary Traumatic Stress in Registered Nurses in an Eastern Canadian Province: A Cross-Sectional Study.</p>	<p>Organizational support is essential to improve work engagement.</p> <p>Innovation and collaboration can improve the nurses' practice environments,</p> <p>Heedful relating minimizes burnout and stress in nurses.</p>	<p>Organizational predictors -> work engagement -> reduce burnout</p> <p>Workload and reward -> work engagement</p>	<p>Organizational predictors -> work engagement -> reduce burnout</p> <p>Workload and reward -> work engagement</p>
<p>Seok, Y., Cho, Y., Kim, N., Suh, E. E., Martínez-Sabater, A., Chover-Sierra, E., & Saus-Ortega, C. (2023). Degree of Alarm Fatigue and Mental Workload of Hospital</p>	<p>Perceived organizational predictors of mental workload to improve patient safety.</p> <p>Perceived adequate organizational support positively associated with work engagement.</p>	<p>Mental health and alarm fatigue -> workload nurses.</p> <p>Organizational Management -> fatigue management -> Prevent hazardous events</p>	<p>Mental health and alarm fatigue -> workload nurses.</p> <p>Organizational Management -> fatigue management -> Prevent hazardous events</p>

Author(s) and date	Data Extracted	Initial Codes	Preliminary Themes
Nurses in Intensive Care Units.			
Bahrami Nejad Joneghani, R.; Bahrami Nejad Joneghani, R.; Dustmohammadloo, H.; Bouzari, P.; Ebrahimi, P.; Fekete-Farkas, M. (2023). Self-Compassion, Work Engagement, and Job Performance among Intensive Care Nurses during COVID-19 Pandemic: The Mediation Role of Mental Health and the Moderating Role of Gender.	<p>The effects of self-compassion and work engagement on job performance are mediated by mental health.</p> <p>Recognize the factors in nurses' mental health to intervene and improve job performance.</p>	<p>Nurses' job performance -> self-compassion -> mental health</p> <p>Stress management -> promote mental health -> job performance</p> <p>Work engagement -> motivation -> enthusiasm -> work tasks</p>	<p>Nurses' job performance -> self-compassion -> mental health</p> <p>Stress management -> promote mental health -> job performance</p> <p>Work engagement -> motivation -> enthusiasm -> work tasks</p>
Cheng, H., Liu, G., Yang, J., Wang, Q., & Yang, H. (2023). Shift work disorder, mental health and burnout among nurses: A cross-sectional study.	<p>Predictors of work engagement for job satisfaction and physical health.</p> <p>Mental health -> Work engagement</p>	<p>Burnout ->Mental health -> job satisfaction</p> <p>Physical health -> Work engagement</p>	<p>Burnout ->Mental health -> job satisfaction</p> <p>Physical health -> Work engagement</p>
Abou Hashish, E. A., & Ghanem Atalla, A. D. (2023). The Relationship Between Coping Strategies, Compassion Satisfaction, and Compassion Fatigue	<p>Recognized organizational support is positively associated with heedful problem-solving in nurses' work.</p> <p>Perceived eliminate compassion fatigue in nurses and improve nurses' satisfaction.</p>	<p>Compassion Satisfaction -> Problem-Solving -> Compassion Fatigue</p>	<p>Compassion Satisfaction -> Problem-Solving -> Compassion Fatigue</p>

Author(s) and date	Data Extracted	Initial Codes	Preliminary Themes
During the COVID-19 Pandemic.			

Appendix E: Final Concept/Thematic Map

