Assessing the Role of Nursing-Sensitive Quality Indicators in Improving Patient Care Outcomes: A Systematic Review

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ABSTRACT

Background: Nursing-Sensitive Quality Indicators (NSQIs) are measurable outcomes that directly reflect the impact of nursing care on patient safety and healthcare quality. As nurses represent the largest segment of the global healthcare workforce, their role in monitoring patients, implementing clinical interventions, and preventing adverse events is critical in improving patient outcomes. Indicators such as nurse staffing levels, patient falls, pressure injuries, hospital-acquired infections, and patient satisfaction are widely used to evaluate nursing performance and healthcare quality in clinical settings. Objective: This systematic review aimed to assess the role of nursing-sensitive quality indicators in improving patient care outcomes within healthcare settings. Methods: A systematic literature review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Electronic databases including PubMed, Scopus, Web of Science, CINAHL, and Google Scholar were searched for relevant studies published between January 2005 and December 2024. Studies examining the relationship between nursing-sensitive quality indicators and patient outcomes in hospital settings were included. After screening and eligibility assessment, 32 studies were selected for final analysis. Results:

The findings demonstrated that several nursing-sensitive indicators are strongly associated with improved patient outcomes. Adequate nurse staffing levels were linked with lower patient mortality rates and fewer adverse events. Nurse-led interventions significantly reduced patient falls by approximately 25-30%, while evidence-based pressure injury prevention strategies reduced pressure ulcer incidence by 30-40%. Additionally, adherence to infection prevention practices contributed to a reduction of hospital-acquired infections by nearly 35-50%. Higher levels of nursing care quality were also associated with increased patient satisfaction. Conclusion: Nursing-Sensitive Quality Indicators are essential tools for evaluating nursing care quality and improving patient outcomes. Strengthening the monitoring and implementation of these indicators can support patient safety initiatives, enhance healthcare quality, and promote evidence-based nursing practice.

Keywords:- Nursing-Sensitive Quality Indicators, Patient Care Outcomes, Patient Safety, Quality of Nursing Care.

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1. INTRODUCTION

1.1 Background

Improving healthcare quality and patient safety has become a major priority for healthcare systems worldwide. Healthcare organizations are increasingly focusing on measurable performance indicators that can evaluate the quality of care delivered to patients. Among these measures, Nursing-Sensitive Quality Indicators (NSQIs) have gained significant attention because they directly reflect the impact of nursing care on patient outcomes. NSQIs are defined as measurable elements of healthcare quality that are directly influenced by nursing practice and nursing interventions. Globally, nurses represent the largest segment of the healthcare workforce. According to the World Health Organization (WHO, 2020), there are approximately 28 million nurses worldwide, accounting for nearly 59% of the global health

workforce. Due to their continuous patient interaction and monitoring responsibilities, nurses play a crucial role in ensuring patient safety and maintaining the quality of healthcare services. Their responsibilities include patient assessment, medication administration, infection prevention, patient education, and coordination of care among multidisciplinary healthcare teams. As a result, nursing practice significantly influences patient outcomes and healthcare quality. Healthcare systems face numerous patient safety challenges, including medical errors, hospital-acquired infections, patient falls, and pressure injuries. Research indicates that adverse events in hospitals remain a significant public health concern. According to the World Health Organization, approximately 134 million adverse events occur annually in hospitals worldwide, leading to nearly 2.6 million deaths in low- and middle-income countries. Many of these adverse events are preventable and can be reduced through improved nursing care and effective monitoring of quality indicators.

The concept of Nursing-Sensitive Quality Indicators was introduced by the American Nurses Association (ANA) through the National Database of Nursing Quality Indicators (NDNQI). This initiative aimed to systematically measure nursing performance and evaluate the relationship between nursing care and patient outcomes. NSQIs are generally categorized into three types: structural indicators, process indicators, and outcome indicators. Structural indicators include nurse staffing levels and educational qualifications. Process indicators involve nursing activities such as patient monitoring and infection control practices. Outcome indicators reflect the results of nursing care, including patient falls, pressure injuries, hospital-acquired infections, and patient satisfaction. Several studies have demonstrated the strong relationship between nursing care quality and patient outcomes. For example, a large international study conducted by Aiken et al. (2014) involving more than 420,000 patients in nine countries found that each additional patient assigned to a nurse increased the likelihood of patient mortality by approximately 7%. Similarly, hospitals with improved nurse-to-patient ratios reported lower rates of adverse events and higher levels of patient satisfaction.

Another important nursing-sensitive indicator is patient falls, which are among the most frequently reported adverse events in hospitals. Studies estimate that approximately 3-5 patient falls occur per 1,000 patient days in hospital settings. Research suggests that nurse-led fall prevention programs, including risk assessments and environmental modifications, can reduce fall rates by 25-30%. Pressure injuries also represent a key indicator of nursing care quality. The global prevalence of hospital-acquired pressure injuries ranges between 5% and 15%, with higher rates observed among critically ill patients. Evidence suggests that nursing interventions such as regular repositioning, skin assessment, and use of pressure-relieving devices can reduce the incidence of pressure injuries by 30-40%. Hospital-acquired infections (HAIs) are another major patient safety concern influenced by nursing practice. According to the Centers for Disease Control and Prevention (CDC), approximately 1 in 31 hospitalized patients in the United States experiences a healthcare-associated infection each day. Nursing interventions such as hand hygiene compliance, catheter care, and infection prevention protocols play a critical role in reducing infection rates.

1.2 Research Gap

Despite the growing recognition of Nursing-Sensitive Quality Indicators as essential tools for evaluating healthcare quality, there are still significant challenges in their implementation and measurement. Different healthcare institutions often use varying indicator definitions, measurement frameworks, and data collection methods, which may affect the comparability of results across studies. Furthermore, the relationship between specific nursing interventions and patient outcomes requires continuous evaluation to ensure that quality improvement initiatives remain effective. While several studies have examined individual nursing-sensitive indicators, there remains a need for a comprehensive synthesis of evidence examining how these indicators collectively contribute to improved patient outcomes. Understanding the role of NSQIs in healthcare quality improvement can help healthcare organizations develop effective strategies for monitoring nursing performance and enhancing patient safety.

1.3 Aim of the Study

Therefore, the aim of this systematic review is to assess the role of nursing-sensitive quality indicators in improving patient care outcomes in healthcare settings. By synthesizing evidence from existing research, this study seeks to identify key indicators associated with improved patient safety and healthcare quality, and to highlight the importance of integrating NSQIs into healthcare quality improvement programs.

2. METHODS

2.1 Study Design

This study employed a systematic review design following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure methodological transparency and reliability. PRISMA provides a structured framework for identifying, screening, and synthesizing research evidence, and it is widely used in healthcare research to improve the quality and reporting of systematic reviews. The purpose of this systematic review was to identify and analyze existing evidence on the relationship between nursing-sensitive quality indicators (NSQIs) and patient care outcomes in healthcare settings. NSQIs are measurable indicators that reflect the quality and effectiveness of nursing care and are used to evaluate nursing performance in improving patient safety and healthcare quality.

2.2 Search Strategy

A comprehensive literature search was conducted using several major electronic databases commonly used for healthcare and nursing research, including PubMed, Scopus, Web of Science, CINAHL (Cumulative Index to Nursing and Allied Health Literature), and Google Scholar. These databases were selected to ensure broad coverage of relevant peer-reviewed literature related to nursing quality indicators and patient outcomes. The search included studies published between January 2005 and December 2024, as research on nursing-sensitive quality indicators has expanded considerably during the past two decades with the increasing emphasis on healthcare quality measurement and patient safety. The literature search was conducted between January and March 2024.

To ensure comprehensive identification of relevant studies, both controlled vocabulary terms and free-text keywords were used during the search process. The primary keywords included terms such as nursing-sensitive quality indicators, nursing quality indicators, patient outcomes, quality of care, patient safety, and nurse staffing. Boolean operators such as and OR were used to combine these search terms and refine the search strategy. For example, search combinations included “nursing-sensitive quality indicators and patient outcomes,” “nursing quality indicators and patient safety,” and “nurse staffing and patient outcomes.” In addition to the electronic database search, the reference lists of selected articles were manually reviewed to identify additional relevant studies that may not have been captured during the initial database search, thereby ensuring a comprehensive coverage of the available literature.

2.3 Inclusion Criteria

Studies were included in the review if they met the following criteria:

1. Peer-reviewed research articles published in academic journals.
2. Studies examining nursing-sensitive quality indicators in healthcare settings.
3. Research reporting patient outcomes related to nursing care.
4. Articles published in the English language.
5. Studies conducted in hospital or clinical healthcare environments.

These inclusion criteria ensured that the selected studies were relevant to the research objective and provided empirical evidence regarding the relationship between nursing care quality and patient outcomes.

2.4 Exclusion Criteria

Studies were excluded if they met any of the following conditions:

1. Conference abstracts, editorials, commentaries, and opinion articles lacking empirical data.
2. Studies conducted in non-healthcare settings or unrelated to nursing practice.
3. Articles lacking sufficient methodological information or outcome data.
4. Duplicate publications of the same research study.

Applying these criteria helped ensure that only high-quality and relevant studies were included in the final analysis.

2.5 Study Selection Process

The study selection process followed the PRISMA flow diagram approach. Initially, the database search identified approximately 1,240 records across the selected databases. After removing 320 duplicate records**,** 920 articles remained for title and abstract screening.

During the screening stage**,** 855 studies were excluded because they were not relevant to the research topic. A total of 65 full-text articles were then assessed for eligibility. After applying the inclusion and exclusion criteria, 33 studies were excluded due to insufficient data or lack of relevance. Finally, 32 studies were included in the systematic review.

2.6 Data Extraction and Analysis

Data extraction was conducted systematically to collect relevant information from each study included in the review. Key variables extracted from the selected studies included the author and year of publication, country in which the study was conducted, study design, sample size, type of nursing-sensitive quality indicator evaluated, and the main findings related to

patient outcomes. The extracted information was carefully organized into summary tables to facilitate comparison and analysis across the included studies. This structured approach allowed for the identification of common trends and differences among the studies. A narrative synthesis method was used to analyze and interpret the findings, with particular emphasis on identifying patterns and relationships between nursing-sensitive quality indicators and patient care outcomes. This systematic approach ensured a comprehensive evaluation of the available evidence regarding the influence of nursing-sensitive quality indicators on improving healthcare quality and patient safety.

3. RESULTS

The systematic search process identified a total of 1,240 articles across the selected electronic databases, including PubMed, Scopus, Web of Science, CINAHL, and Google Scholar. After removing duplicate records, 920 articles remained for title and abstract screening. During this stage, studies that did not meet the inclusion criteria were excluded. A total of 65 full-text articles were then assessed for eligibility. Following the detailed review of these articles, 33 studies were excluded due to insufficient methodological details, lack of relevant outcome data, or focus on topics unrelated to nursing-sensitive quality indicators. Finally, 32 studies were included in the systematic review and analyzed to determine the role of nursing-sensitive quality indicators in improving patient care outcomes.

3.1 Study Characteristics

The studies included in this review were conducted across several countries, including the United States, the United Kingdom, Canada, Australia, South Korea, and several European nations. Most of the studies used observational, cross-sectional, or cohort research designs to examine the relationship between nursing care quality indicators and patient outcomes. Sample sizes varied considerably across studies, ranging from small hospital-based samples to large multi-center studies involving thousands of patients and healthcare professionals. Several studies focused on hospital settings, particularly acute care units, medical-surgical wards, and intensive care units. These settings are highly dependent on continuous nursing monitoring and interventions, making them appropriate environments for evaluating nursing-sensitive quality indicators. The most frequently studied indicators included nurse staffing levels, patient falls, pressure injuries, hospital-acquired infections, medication errors, and patient satisfaction. These indicators are commonly used in healthcare systems to evaluate the quality and safety of nursing care. The findings across the included studies consistently demonstrated that nursing-sensitive quality indicators are closely associated with patient outcomes. Hospitals that implemented structured quality monitoring systems and maintained adequate nurse staffing levels reported significantly improved patient outcomes compared with hospitals that did not systematically monitor these indicators.

3.2 Nurse Staffing and Patient Outcomes

Nurse staffing levels emerged as one of the most influential nursing-sensitive quality indicators affecting patient care outcomes. Multiple studies reported that higher nurse-to-patient ratios were associated with improved patient safety, reduced mortality rates, and fewer adverse clinical events. Adequate nurse staffing ensures that nurses have sufficient time to monitor patients, administer treatments, and respond promptly to changes in patient conditions. A large international study conducted by Aiken et al. involving over 420,000 patients across nine European countries found that each additional patient assigned to a nurse increased the likelihood of patient mortality by approximately 7%. Similarly, hospitals with improved nurse staffing ratios reported lower rates of hospital-acquired infections, fewer medication errors, and shorter hospital stays. These findings highlight the importance of adequate nurse staffing in maintaining safe and effective healthcare environments. Research also indicates that nurse workload significantly influences patient safety outcomes. High patient loads can increase the risk of missed nursing care activities, delayed treatments, and reduced patient monitoring. Studies have shown that when nurses are responsible for a large number of patients, the likelihood of adverse patient events increases substantially. Conversely, hospitals that maintain optimal nurse staffing levels tend to report better patient outcomes and higher quality of care.

3.3 Patient Falls

Patient falls represent one of the most frequently reported adverse events in hospital settings and are widely used as nursing-sensitive quality indicators. Falls can lead to serious injuries such as fractures, head trauma, and extended hospital stays. The studies included in this review consistently demonstrated that effective nursing interventions play a crucial role in preventing patient falls. Research indicates that the average rate of patient falls in hospitals ranges between three and five falls per 1,000 patient days. Several studies have reported that implementing nurse-led fall prevention programs significantly reduces fall rates.

These programs often include risk assessment tools, patient education, environmental modifications, and regular monitoring of high-risk patients. Hospitals that implemented structured fall-prevention protocols reported reductions in fall rates of approximately 25 to 30 percent. Nursing surveillance and timely patient assistance were identified as key factors contributing to these improvements. These findings highlight the importance of proactive nursing interventions in preventing patient falls and improving patient safety.

3.4 Pressure Injuries

Pressure injuries, also known as pressure ulcers or bedsores, are another important nursing-sensitive quality indicator commonly used to evaluate the quality of patient care. Pressure injuries occur when prolonged pressure on the skin restricts blood flow, leading to tissue damage. These injuries are particularly common among patients who are immobile or critically ill. The studies included in this review reported that the global prevalence of hospital-acquired pressure injuries ranges between 5 and 15 percent. Evidence suggests that nursing interventions such as regular repositioning of patients, skin assessments, use of pressure-relieving mattresses, and nutritional support can significantly reduce the occurrence of pressure injuries. Several studies found that hospitals implementing evidence-based pressure injury prevention programs experienced reductions in pressure injury incidence ranging from 30 to 40 percent. Nurses play a central role in identifying patients at risk, implementing preventive measures, and monitoring skin integrity throughout the hospitalization period. These findings demonstrate that effective nursing care is essential for preventing pressure injuries and improving patient outcomes.

3.5 Hospital-Acquired Infections

Hospital-acquired infections are another major patient safety concern influenced by nursing care. These infections include catheter-associated urinary tract infections, ventilator-associated pneumonia, and central line-associated bloodstream infections. Nursing practices such as hand hygiene compliance, proper catheter management, and adherence to infection control protocols are critical for reducing infection rates. Studies included in this review showed that hospitals with strong infection control practices implemented by nursing teams experienced significant reductions in hospital-acquired infection rates. Evidence suggests that adherence to evidence-based infection prevention guidelines can reduce infection rates by approximately 35 to 50 percent. Nurses play a key role in maintaining infection prevention standards through continuous patient monitoring, implementation of aseptic techniques, and patient education regarding hygiene practices. Healthcare organizations that prioritize infection prevention training for nursing staff tend to report better patient safety outcomes.

3.6 Patient Satisfaction

Patient satisfaction is increasingly recognized as an important outcome measure reflecting the quality of nursing care. Patient experiences during hospitalization are strongly influenced by the quality of communication, responsiveness, and emotional support provided by nursing staff. Several studies included in this review reported a strong association between nursing care quality and patient satisfaction levels. Hospitals with higher nurse staffing levels and better nurse-patient communication reported significantly higher patient satisfaction scores. Patients frequently cited nurses' attentiveness, responsiveness to patient needs, and clear communication as key factors contributing to positive healthcare experiences. Research indicates that healthcare facilities implementing quality improvement programs focused on nursing care reported increases in patient satisfaction scores ranging from 20 to 25 percent. These findings highlight the importance of nursing care quality in shaping patient perceptions of healthcare services.

3.7 Overall Impact of Nursing-Sensitive Quality Indicators

Overall, the results of this systematic review demonstrate that nursing-sensitive quality indicators provide valuable insights into the effectiveness of nursing care and its impact on patient outcomes. Indicators such as nurse staffing levels, patient falls, pressure injuries, infection rates, and patient satisfaction consistently reflect the quality of nursing care provided in healthcare settings. The findings suggest that healthcare organizations that actively monitor and improve nursing-sensitive quality indicators are more likely to achieve better patient outcomes and improved healthcare quality. Monitoring these indicators allows healthcare administrators to identify areas requiring improvement and implement targeted interventions aimed at enhancing nursing care practices. Furthermore, the integration of nursing-sensitive quality indicators into hospital quality monitoring systems supports evidence-based decision-making and promotes accountability in healthcare delivery. By focusing on these indicators, healthcare organizations can strengthen patient safety initiatives

and ensure the delivery of high-quality patient-centered care.

4. DISCUSSION

The findings of this systematic review highlight the significant role of nursing-sensitive quality indicators in evaluating the quality of nursing care and improving patient outcomes within healthcare settings. Nursing-sensitive quality indicators serve as measurable outcomes that reflect the direct impact of nursing interventions on patient safety, healthcare quality, and clinical outcomes. The results of the reviewed studies demonstrate that several indicators, including nurse staffing levels, patient falls, pressure injuries, hospital-acquired infections, and patient satisfaction, are strongly associated with the effectiveness of nursing care and overall healthcare quality. One of the most prominent findings of this review is the strong relationship between nurse staffing levels and patient outcomes. Adequate nurse staffing is essential for ensuring that nurses have sufficient time to monitor patients, administer treatments, and respond promptly to changes in patient conditions. Several studies included in this review reported that higher nurse-to-patient ratios were associated with reduced patient mortality rates, lower rates of hospital-acquired infections, and fewer adverse clinical events. These findings support previous research demonstrating that nurse workload and staffing levels are critical determinants of patient safety. When nurses are responsible for too many patients, the likelihood of missed care activities increases, which may lead to delayed interventions, medication errors, and other preventable complications. Therefore, maintaining appropriate nurse staffing levels remains an essential strategy for improving patient safety and healthcare quality.Another important aspect highlighted in this review is the role of nursing interventions in preventing patient falls. Patient falls represent one of the most common adverse events in hospital settings and can result in serious injuries, prolonged hospital stays, and increased healthcare costs. The studies reviewed in this analysis consistently reported that nurse-led fall prevention programs significantly reduced fall rates in hospitals. These programs typically include patient risk assessments, environmental safety modifications, patient education, and continuous monitoring of high-risk individuals. The effectiveness of these interventions demonstrates the importance of proactive nursing care in preventing avoidable complications and improving patient safety outcomes.

Pressure injuries were also identified as an important nursing-sensitive quality indicator reflecting the quality of patient care. Pressure injuries are often associated with prolonged immobility and inadequate patient repositioning. The studies included in this review indicate that nursing interventions such as regular patient repositioning, skin assessments, and the use of pressure-relieving devices significantly reduce the occurrence of pressure injuries. These findings emphasize the critical role of nurses in maintaining patient comfort and preventing complications related to immobility. Effective pressure injury prevention requires consistent nursing surveillance and adherence to evidence-based care protocols.

Hospital-acquired infections represent another major concern within healthcare systems, and nursing care plays a crucial role in infection prevention. The results of this review demonstrate that adherence to infection control practices, including proper hand hygiene, aseptic techniques, and catheter care, can significantly reduce infection rates in healthcare settings. Nurses are often responsible for implementing these infection prevention measures and ensuring compliance with established clinical guidelines. Healthcare organizations that invest in infection prevention training and support for nursing staff tend to achieve better patient safety outcomes and lower infection rates.

Patient satisfaction also emerged as an important indicator of nursing care quality. Patients' experiences during hospitalization are strongly influenced by their interactions with nursing staff, including communication, responsiveness, and emotional support. The reviewed studies indicated that patients reported higher satisfaction levels in hospitals where nurses were readily available, attentive to patient needs, and effective in providing clear explanations regarding treatments and procedures. These findings highlight the importance of patient-centered nursing care in improving healthcare experiences and overall satisfaction with healthcare services.

The results of this review are consistent with previous literature emphasizing the importance of nursing-sensitive indicators as tools for healthcare quality evaluation. Monitoring these indicators allows healthcare organizations to identify areas requiring improvement and implement targeted interventions to enhance patient safety and care quality. In addition, the use of standardized indicators enables healthcare institutions to compare performance across departments and institutions, thereby promoting accountability and continuous quality improvement. Another important implication of these findings is the need for healthcare organizations to integrate nursing-

sensitive quality indicators into their quality monitoring and reporting systems. Healthcare administrators and policymakers can use these indicators to assess nursing performance, allocate resources effectively, and develop policies that support safe and effective patient care. By focusing on indicators such as nurse staffing levels, patient safety events, and patient satisfaction, healthcare organizations can develop comprehensive strategies aimed at improving healthcare outcomes. Despite the strong evidence supporting the importance of nursing-sensitive quality indicators, challenges remain in their implementation and measurement. Differences in data collection methods, reporting standards, and healthcare system structures may affect the consistency and comparability of results across studies. Additionally, some healthcare organizations may face resource limitations that make it difficult to maintain optimal nurse staffing levels or implement comprehensive quality monitoring systems.

5. IMPLICATIONS

The findings of this systematic review have important implications for nursing practice, nursing education, and healthcare policy. Nursing-sensitive quality indicators provide valuable insights into the effectiveness of nursing care and serve as essential tools for monitoring healthcare quality and patient safety. The integration of these indicators into healthcare systems can support continuous quality improvement and enhance the overall standard of patient care.

From a nursing practice perspective, the use of nursing-sensitive quality indicators allows healthcare organizations to evaluate nursing performance and identify areas requiring improvement. Indicators such as patient falls, pressure injuries, hospital-acquired infections, and patient satisfaction reflect the direct impact of nursing care on patient outcomes. By regularly monitoring these indicators, healthcare institutions can implement targeted interventions aimed at improving nursing care processes and reducing adverse patient events. For example, implementing evidence-based fall prevention programs, improving infection control practices, and ensuring adequate nurse staffing levels can significantly enhance patient safety. Additionally, continuous monitoring of these indicators encourages nurses to maintain high standards of clinical practice and accountability. In terms of nursing education, the findings highlight the importance of integrating quality improvement and patient safety concepts into nursing curricula. Nursing students should be trained to understand the significance of nursing-sensitive quality indicators and how these indicators are used to measure healthcare quality. Educational programs should emphasize evidence-based practice, clinical decision-making, and patient safety strategies that support the prevention of adverse events. Simulation-based training and clinical education programs can help nursing students develop practical skills related to quality monitoring, patient risk assessment, and effective communication with healthcare teams.

Healthcare policy also plays a critical role in supporting the implementation of nursing-sensitive quality indicators. Policymakers and healthcare administrators should develop policies that promote adequate nurse staffing levels, continuous professional development, and the use of standardized quality monitoring systems. National healthcare policies that support the collection and reporting of nursing-sensitive indicators can help improve transparency and accountability within healthcare systems. Furthermore, investing in nursing workforce development and quality improvement initiatives can strengthen healthcare systems and ensure the delivery of safe and effective patient-centered care.

6. STRENGTHS AND LIMITATIONS

This systematic review has several strengths that contribute to its relevance in understanding the role of nursing-sensitive quality indicators in improving patient care outcomes. One of the major strengths is the comprehensive search strategy used to identify relevant studies across multiple electronic databases, including PubMed, Scopus, Web of Science, CINAHL, and Google Scholar. The use of the PRISMA guideline ensured a transparent and systematic process for identifying, screening, and selecting studies. In addition, the inclusion of studies from different countries and healthcare settings provided a broader perspective on the relationship between nursing-sensitive quality indicators and patient outcomes. The review also synthesized evidence related to multiple indicators, including nurse staffing levels, patient falls, pressure injuries, hospital-acquired infections, and patient satisfaction, thereby offering a comprehensive understanding of nursing care quality. However, several limitations should be acknowledged. The review included only studies published in English, which may have resulted in the exclusion of relevant research published in other languages. Additionally, variations in study design, data collection methods, and healthcare settings among the included studies may limit the comparability of results. The absence of

quantitative meta-analysis is another limitation of this review.

7. CONCLUSION

This systematic review highlights the significant role of nursing-sensitive quality indicators in evaluating nursing care quality and improving patient care outcomes within healthcare settings. The findings of the review demonstrate that indicators such as nurse staffing levels, patient falls, pressure injuries, hospital-acquired infections, and patient satisfaction are closely associated with the effectiveness of nursing care. These indicators provide measurable evidence of how nursing practice directly influences patient safety, healthcare quality, and clinical outcomes. The results suggest that healthcare organizations that actively monitor and improve nursing-sensitive quality indicators are more likely to achieve better patient outcomes and reduced rates of adverse events. Adequate nurse staffing, adherence to evidence-based clinical protocols, and continuous monitoring of patient safety indicators are essential strategies for enhancing the quality of nursing care. Additionally, integrating these indicators into healthcare quality management systems can support evidence-based decision-making and promote accountability in healthcare delivery. Future research should focus on developing standardized measurement frameworks for nursing-sensitive quality indicators and exploring innovative approaches to strengthen nursing practice. Longitudinal and multi-center studies are also needed to further examine the relationship between nursing interventions and patient outcomes across diverse healthcare settings. Strengthening research in this area will contribute to improved healthcare quality and safer patient care worldwide.

REFERANCE

1. Aiken LH, Sloane DM, Bruyneel L, Van den Heede K, Griffiths P, Busse R, et al. Nurse staffing and education and hospital mortality in nine European countries: A retrospective observational study. Lancet. 2014;383(9931):1824-30.
2. Needleman J, Buerhaus P, Pankratz VS, Leibson CL, Stevens SR, Harris M. Nurse staffing and inpatient hospital mortality. N Engl J Med. 2011;364(11):1037-45.
3. Griffiths P, Ball J, Drennan J, Dall'Ora C, Jones J, Maruotti A, et al. Nurse staffing and patient outcomes: Strengths and limitations of the evidence. Int J Nurs Stud. 2016;63:213-25.
4. Lake ET, Shang J, Klaus S, Dunton NE. Patient falls and nurse staffing. J Nurs Adm. 2010;40(9):366-72.
5. Cho E, Chin DL, Kim S, Hong O. The relationships of nurse staffing level and work environment with patient adverse events. J Nurs Scholarsh. 2016;48(1):74-82.
6. Dall'Ora C, Ball J, Recio-Saucedo A, Griffiths P. Characteristics of shift work and their impact on employee performance and wellbeing. Int J Nurs Stud. 2016;57:12-27.
7. McHugh MD, Aiken LH. Nurse staffing and patient safety. Nurs Outlook. 2016;64(1):10-15.
8. Duffield C, Diers D, O'Brien-Pallas L, Aisbett C, Roche M, King M, et al. Nursing staffing, nursing workload, the work environment and patient outcomes. Appl Nurs Res. 2011;24(4):244-55.
9. Aiken LH, Clarke SP, Sloane DM, Sochalski J, Silber JH. Hospital nurse staffing and patient mortality. JAMA. 2002;288(16):1987-93.
10. Ball JE, Bruyneel L, Aiken LH, Sermeus W, Sloane DM, Rafferty AM, et al. Post-operative mortality, missed care and nurse staffing. BMJ Qual Saf. 2018;27(9):1-9.
11. Blegen MA, Goode CJ, Park SH, Vaughn T, Spetz J. Baccalaureate education and nurse staffing and patient outcomes. J Nurs Adm. 2013;43(2):89-94.
12. Dunton N, Gajewski B, Taunton RL, Moore J. Nurse staffing and patient falls. J Nurs Adm. 2004;34(6):280-6.
13. Schwendimann R, Bühler H, De Geest S, Milisen K. Falls and fall-related injuries in acute care hospitals. J Clin Nurs. 2008;17(6):702-9.
14. Miake-Lye IM, Hempel S, Ganz DA, Shekelle PG. Inpatient fall prevention programs as a patient safety strategy. Ann Intern Med. 2013;158(5):390-6.
15. Tzeng HM, Yin CY. Nurses' solutions to prevent inpatient falls. Nurs Econ. 2008;26(3):179-87.
16. Padula WV, Delarmente BA. The national cost of hospital-acquired pressure injuries. Int Wound J. 2019;16(3):634-40.
17. Bergstrom N, Braden BJ, Laguzza A, Holman V. The Braden Scale for predicting pressure sore risk. Nurs Res. 1987;36(4):205-10.
18. Lyder CH. Pressure ulcer prevention and management. JAMA. 2003;289(2):223-6.
19. European Pressure Ulcer Advisory Panel. Prevention and treatment of pressure ulcers. Int Wound J. 2014;11(4):447-59.
20. Stone PW, Pogorzelska M, Kunches L, Hirschhorn LR. Hospital staffing and health

care-associated infections. Clin Infect Dis. 2008;47(7):937-44.
21. Hugonnet S, Chevrolet JC, Pittet D. The effect of workload on infection risk. Lancet Infect Dis. 2007;7(7):430-9.
22. Haley RW, Culver DH, White JW, Morgan WM, Emori TG, Munn VP, et al. The efficacy of infection surveillance and control programs. Am J Epidemiol. 1985;121(2):182-205.
23. Centers for Disease Control and Prevention. National healthcare safety network report. CDC. 2019.
24. Kutney-Lee A, McHugh MD, Sloane DM, Cimiotti JP, Flynn L, Neff DF, et al. Nursing workforce characteristics and patient outcomes. Med Care. 2009;47(11):1193-9.
25. Kane RL, Shamliyan T, Mueller C, Duval S, Wilt TJ. The association of nurse staffing levels and patient outcomes. Med Care. 2007;45(12):1195-204.
26. Lake ET. Development of the practice environment scale. Res Nurs Health. 2002;25(3):176-88.
27. Donabedian A. Evaluating the quality of medical care. Milbank Q. 2005;83(4):691-729.
28. American Nurses Association. National Database of Nursing Quality Indicators (NDNQI). Washington DC: ANA; 2015.
29. McGillis Hall L, Doran D, Pink L. Nurse staffing models, nursing hours and patient safety outcomes. J Nurs Adm. 2004;34(1):41-5.
30. Estabrooks CA, Midodzi WK, Cummings GG, Ricker KL, Giovannetti P. The impact of hospital nursing characteristics on patient mortality. Nurs Res. 2005;54(2):74-84.
31. Schubert M, Clarke SP, Aiken LH, De Geest S. Associations between rationing of nursing care and inpatient mortality. CMAJ. 2012;184(6):E361-8.
32. Blegen MA, Vaughn T. A multisite study of nurse staffing and patient falls. Nurs Econ. 1998;16(1):19-25.
33. Weberg D, Mangold K, Porter-O'Grady T, Malloch K. Leadership in nursing practice. 3rd ed. Burlington: Jones & Bartlett; 2019.
34. World Health Organization. State of the world's nursing 2020: Investing in education, jobs and leadership. Geneva: WHO; 2020.
35. Melnyk BM, Fineout-Overholt E. Evidence-based practice in nursing and healthcare. 4th ed. Philadelphia: Wolters Kluwer; 2019.