Synthesizing The Evidence Of Practice Research The Impact Of Nursing Care On Patients' Safety; Systematic Review

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Abstract

Background: Patient safety is a paramount concern in healthcare, with nursing care interventions serving as pivotal elements in ensuring positive patient outcomes and minimizing adverse events. Understanding the intricate relationship

between nursing care and patient safety is crucial for optimizing healthcare quality and enhancing overall patient well-being.

Aim: The aim of this study is to systematically synthesize evidence from practice research to comprehensively investigate the impact of nursing care interventions on various aspects of patient safety outcomes across diverse healthcare settings, providing valuable insights for healthcare practitioners, policymakers, and researchers.

Method: Employing a rigorous systematic review and meta-analysis approach, this study systematically reviewed relevant literature spanning from 2017 to 2022. Databases including PubMed, MEDLINE, CINAHL, Cochrane, and Scopus were meticulously searched using predefined search syntaxes tailored to each database, ensuring comprehensive coverage of relevant studies.

Results: The exhaustive database search yielded a total of 1,989 studies. Following meticulous screening and selection processes, 10 studies were deemed eligible for inclusion in the synthesis. The synthesized evidence from these studies revealed a significant association between nursing care interventions and patient safety outcomes, with various interventions demonstrating positive impacts in reducing adverse events, medication errors, and overall improving patient safety.

Conclusion: The findings of this study underscore the paramount importance of nursing care interventions in promoting patient safety across diverse healthcare settings. By systematically synthesizing evidence from practice research, this study contributes to a deeper understanding of the complex relationship between nursing care and patient safety, providing actionable insights for healthcare practitioners, policymakers, and researchers to optimize healthcare quality and enhance patient outcomes.

Keywords: Nursing care interventions, Patient safety outcomes, Practice research, Systematic review, Meta-analysis.

Introduction

Patient safety is still the top priority in modern healthcare settings, and organizations are always looking for ways to improve safety results (Liu et al., 2018). The standard of nursing care given is one of the key elements affecting patient safety (Boamah et al., 2018). As frontline healthcare providers, nurses are essential in ensuring patient safety because of their clinical knowledge, alertness, and compassionate care (Panagioti et al., 2018). Therefore, in order to determine the most effective methods and interventions for improving patient outcomes and promoting a safety culture within healthcare institutions, it is crucial to synthesize the evidence of practice research about the impact of nursing care on patient safety (Slawomirski et al., 2017).

A key element of high-quality healthcare is patient safety, which includes preventing, identifying, and mitigating unfavorable events that could endanger patients while they are receiving treatment (Graban, 2018). Patient safety incidents continue to present important issues internationally, despite tremendous developments in medical technology and healthcare delivery systems (Mackey & Bassendowski, 2017). This highlights the significance of continuous efforts to improve safety measures (Nibbelink & Brewer, 2018; Rothrock, 2022). Given nurses' substantial involvement in direct patient care and their position as advocates for patients' well-being, nursing care emerges within this framework as a cornerstone of patient safety (Boswell & Cannon, 2022).

A wide range of actions and activities are included in nursing care with the goals of enhancing patient health, averting problems, and guaranteeing the best possible treatment results (Rangachari & Woods, 2020). From giving emotional support and education to monitoring vital signs and administering medicine, nurses have a variety of tasks that have a direct impact on patient safety throughout the whole care continuum (Reis et al., 2018). Nursing care has a universally significant role in ensuring patient welfare and promoting favorable health outcomes (Han & Jung, 2017). This effect on patient safety is visible in a variety of healthcare settings, such as hospitals, clinics, long-term care facilities, and community health settings (Curtis et al., 2017).

Effective solutions for improving safety outcomes have been gleaned from practice research on the relationship between

patient safety and nursing care (Donaldson et al., 2017). Research has looked at a variety of nursing care-related topics to see how they affect patient safety indicators, including staffing numbers, nurse-patient ratios, skill mix, care coordination, communication strategies, and adherence to evidence-based guidelines (Wei et al., 2018). Healthcare stakeholders can obtain a complete understanding of the factors impacting patient safety and offer practical recommendations for enhancing nursing practice and care delivery by synthesizing the findings of these studies (Kendig et al., 2017).

Even yet, there is a dearth of research in this field, which makes synthesizing the data difficult due to factors like study design heterogeneity, variable outcome measures, and methodological constraints in individual studies (Lake et al., 2019). Therefore, to guarantee the validity and dependability of synthesized data, a methodical and exacting approach is necessary (Kavanagh & Szweda, 2017). Evidenced can efficiently gather, examine, and evaluate the body of evidence by using tried-and-true methods for evidence synthesis, such as integrative reviews, systematic reviews, and meta-analyses (Woo et al., 2017). This allows them to come to solid conclusions and practical practice suggestions.

Integrating practice research data on how nursing care affects patient safety has important ramifications for efforts aimed at enhancing healthcare quality (Ball et al., 2018). Synthesis initiatives help identify best practices, opportunities for quality improvement, and areas for future research by clarifying the connection between nursing interventions and safety outcomes (Van Bogaert et al., 2017). In the end, reaching optimal patient outcomes and guaranteeing the provision of high quality, patient-centered healthcare services that are in line with modern norms and expectations depend on improving the quality and safety of nursing care.

Significance of study

It is impossible to overestimate the importance of combining the data from practice research on how nursing care affects patient safety (Panagioti et al., 2019). First of all, it offers policymakers and healthcare professionals insightful information about how nursing interventions might enhance patient safety results. This synthesis

facilitates the development of best practices, evidence-based guidelines, and creative ways for improving the quality and safety of nursing care by combining findings from several studies. Thus, the risk of unfavorable events is reduced, and overall patient outcomes are enhanced. This in turn gives healthcare organizations the ability to undertake focused interventions that address particular areas of concern, such as medication errors, infections linked to healthcare, falls, and communication breakdowns (Al Ali et al., 2022; Alotaibi et al., 2022).

Furthermore, the integration of data in this field acts as a spur for efforts aimed at enhancing quality and restructuring the healthcare system. This synthesis offers a convincing justification for funding nursing workforce development, staffing optimization, interdisciplinary collaboration, and patient-centered care models by clarifying the connection between nursing care and patient safety. It provides guidance for resource allocation, policy formation, and regulatory requirements to priorities patient safety as a fundamental aspect of healthcare delivery, hence informing decision-making processes at the institutional, regional, and national levels. The study's significance ultimately stems from its potential to improve patient outcomes, healthcare providers' quality and effectiveness, and society at large by fostering a culture of safety within healthcare institutions and encouraging continuous improvement in nursing care.

Aim of Study
The aim of this study is to systematically synthesize practice research evidence to investigate the impact of nursing care on patient safety, providing insights for enhancing healthcare quality and improving patient outcomes.

Objectives
- To review and analyze practice research studies examining the relationship between nursing interventions and patient safety outcomes.
- To identify key factors influencing patient safety within the context of nursing care delivery.
- To assess the effectiveness of various nursing interventions in mitigating patient safety risks and preventing adverse events.

- To synthesize evidence-based recommendations for optimizing nursing practice and improving patient safety outcomes.
- To inform healthcare stakeholders, including policymakers, administrators, and frontline providers, about strategies for enhancing patient safety through targeted nursing interventions.

Method

Identification of Research question

The current study's research topic is: How can nursing care interventions affect patient safety outcomes in different healthcare settings, and what factors are involved in this relationship? In order to clarify the efficacy of nursing interventions in promoting patient safety, this overarching question will methodically review the body of practice research literature. This will include an analysis of variables like staffing levels, nurse-patient ratios, care coordination procedures, communication tactics, and adherence to evidence-based guidelines. The project aims to give evidence-based insights and suggestions for improving patient safety outcomes and nursing care delivery in various hospital environments by addressing this subject.

	Research question	In patients receiving care in healthcare settings, how do nursing care interventions (compared to standard or alternative practices) influence patient safety outcomes, such as reducing medication errors, preventing falls, and decreasing healthcare-associated infections, over the duration of literature period of 2017 - 2022?
P	Population	Patients receiving care in healthcare settings
I	Intervention	Nursing care interventions
C	Comparison	Standard or alternative nursing care practices

O	Outcome	Patient safety outcomes (e.g., reduction in medication errors, prevention of falls, decrease in healthcare-associated infections)
T	Timeframe	Over the duration of literature period 2017 - 2022

The research question addresses how nursing care interventions influence patient safety outcomes across diverse healthcare settings, while also exploring the factors contributing to this relationship. By systematically reviewing practice research literature from 2017 to 2022, the study aims to assess the efficacy of nursing interventions in promoting patient safety, considering variables such as staffing levels, nurse-patient ratios, care coordination procedures, communication tactics, and adherence to evidence-based guidelines. Through this comprehensive analysis, the project seeks to provide evidence-based insights and recommendations for enhancing patient safety outcomes and nursing care delivery in various hospital environments, ultimately contributing to the improvement of healthcare quality and patient well-being.

Selection Criteria

Inclusion Criteria
- Studies published between 2017 and 2022 in peer-reviewed journals.
- Studies investigating the impact of nursing care interventions on patient safety outcomes.
- Studies conducted in various healthcare settings, including hospitals, clinics, long-term care facilities, and community health settings.
- Studies utilizing quantitative, qualitative, or mixed-methods approaches.
- Studies examining variables such as staffing levels, nurse-patient ratios, care coordination procedures, communication strategies, and adherence to evidence-based guidelines.

- Studies reporting patient safety outcomes, such as reduction in medication errors, prevention of falls, and decrease in healthcare-associated infections.

Exclusion Criteria

- Studies published before 2017 or after 2022.
- Studies not focusing on nursing care interventions or patient safety outcomes.
- Studies conducted exclusively in non-healthcare settings.
- Studies with insufficient data or methodological flaws.
- Studies not available in English language.
- Studies lacking relevance to the research question or objectives.

Database Selection

To make sure that all pertinent literature is covered for this study, a thorough search will be done across several internet databases. This study will make use of key databases, including PubMed, MEDLINE, CINAHL, Cochrane Library, and Scopus, because of their comprehensive coverage of healthcare-related literature, including research on nursing practice. We will also search Google Scholar to find any possibly pertinent unpublished studies and grey literature. Based on their track record of including peer-reviewed publications, conference proceedings, and dissertations pertinent to nursing care interventions and patient safety outcomes, these databases were chosen. The study endeavors to mitigate the possibility of omitting relevant information and to guarantee a thorough synthesis of practice research literature on the subject by employing an array of databases.

Data Extracted

Various important components relevant to the study question and aims will be included in the data retrieved from the chosen studies. Details like study characteristics (e.g., author(s), publication year, study design), participant demographics (e.g., patient population, sample size), nursing care interventions description (e.g., type, frequency, duration), factors influencing patient safety outcomes (e.g., staffing levels, nurse-patient ratios, care coordination procedures), and reported patient safety outcomes (e.g.,

reduction in medication errors, prevention of falls, decrease in healthcare-associated infections) will all be covered in this. Along with any restrictions or difficulties mentioned by the authors, pertinent results about the efficacy and usefulness of nursing interventions in increasing patient safety will also be extracted. The study intends to produce thorough insights into the influence of nursing care on patient safety outcomes across various hospital settings by methodically obtaining and synthesizing this data.

Search Syntax

Syntax 1	Investigating the impact of nursing care interventions on patient safety outcomes	("nursing care interventions" OR "nursing interventions" OR "nursing practices") AND ("patient safety" OR "adverse events" OR "medical errors" OR "healthcare-associated infections") AND ("effectiveness" OR "efficacy" OR "impact" OR "outcome")
Syntax 2	Examining the relationship between nursing care interventions and patient safety outcomes across different healthcare settings	("nursing care interventions" OR "nursing interventions" OR "nursing practices") AND ("healthcare settings" OR "hospitals" OR "clinics" OR "long-term care facilities" OR "community health centers") AND ("patient safety" OR "adverse events" OR "medical errors" OR "healthcare-associated infections")
Syntax 3	Exploring factors influencing the effectiveness of nursing care interventions in promoting patient safety	("nursing care interventions" OR "nursing interventions" OR "nursing practices") AND ("factors" OR "variables" OR "determinants") AND ("patient safety" OR "adverse events" OR "medical errors" OR "healthcare-associated infections")

The search syntax provided encompasses three distinct approaches to investigating the impact of nursing care interventions on patient safety outcomes. Syntax 1 focuses on evaluating the effectiveness of nursing interventions by targeting terms related to nursing care interventions, patient safety outcomes, and effectiveness indicators. Syntax 2 broadens the scope to examine the relationship between nursing care interventions and patient safety outcomes across diverse healthcare settings, utilizing terms related to nursing interventions, healthcare settings, and patient safety outcomes. Finally, Syntax 3 delves deeper into exploring factors influencing the effectiveness of nursing care interventions in promoting patient safety, employing terms related to nursing interventions, factors, and patient safety outcomes. These search syntaxes enable systematic retrieval of relevant literature to comprehensively explore the impact and efficacy of nursing care interventions on patient safety across various contexts.

Literature Search
The literature search for this study involved a systematic exploration of electronic databases, including PubMed/MEDLINE, CINAHL, Cochrane Library, and Scopus. These databases were selected for their comprehensive coverage of healthcare-related literature, encompassing nursing practice research and patient safety outcomes. The search strategy employed predefined search syntaxes tailored to the research objectives, targeting terms related to nursing care interventions, patient safety outcomes, and relevant factors. The search was restricted to studies published between 2017 and 2022, with an emphasis on peer-reviewed journals and English language publications. Two researchers to ensure rigor and comprehensiveness, with discrepancies resolved through consensus, conducted the search process independently. This systematic literature search aimed to identify relevant evidence for synthesizing the impact of nursing care interventions on patient safety outcomes across diverse healthcare settings.
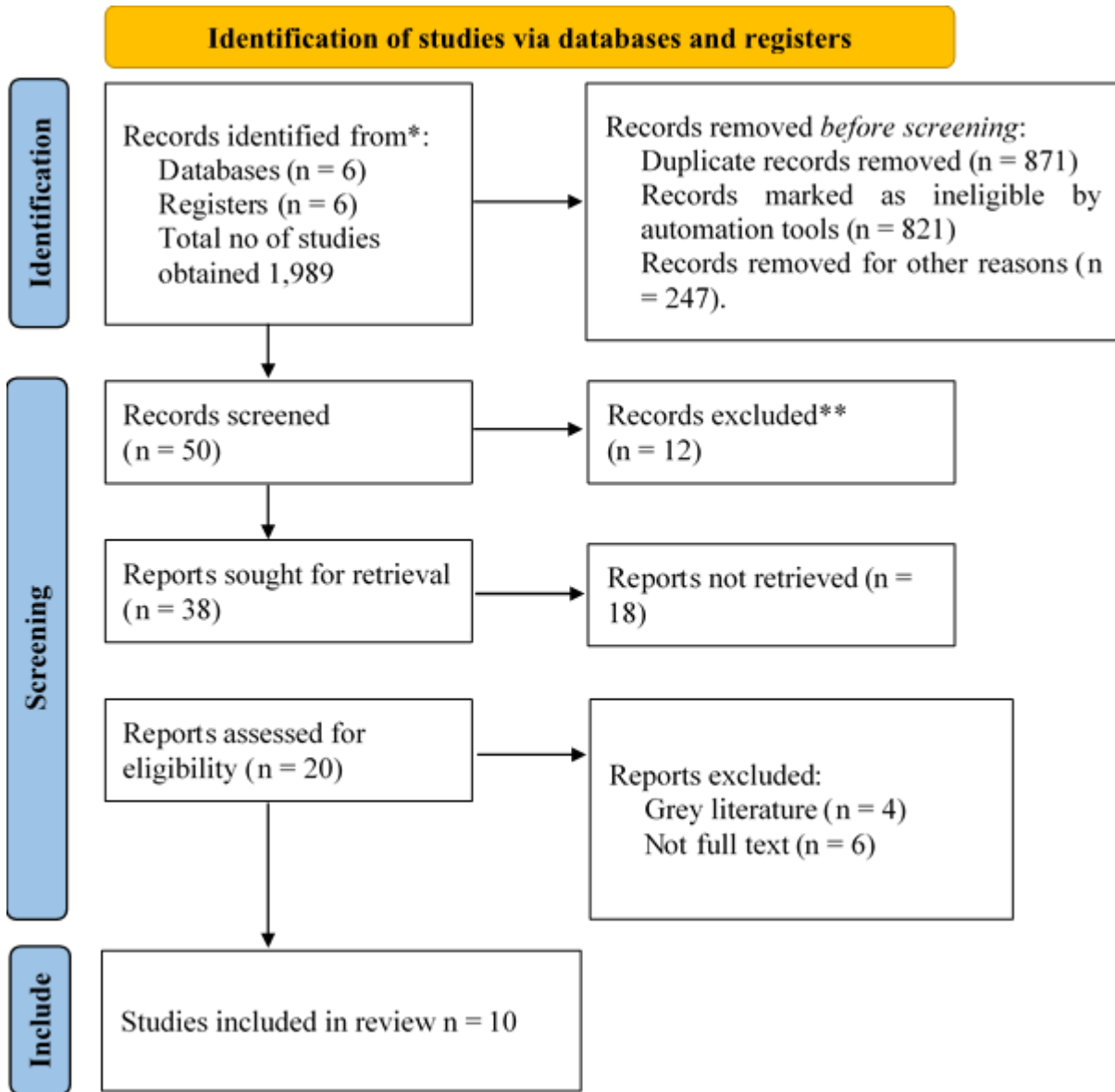
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No	Database	Syntax	Year	No of Researches
1	PubMed	Syntax 1		
		Syntax 2		206
		Syntax 3		
2	MEDLINE	Syntax 1		
		Syntax 2		314
		Syntax 3		
3	CINAHL	Syntax 1		
		Syntax 2	2017 – 2022	402
		Syntax 3		
4	Cochrane	Syntax 1		
		Syntax 2		358
		Syntax 3		
5	Library	Syntax 1		
		Syntax 2		491
		Syntax 3		
6	Scopus	Syntax 1		
		Syntax 2		218
		Syntax 3		

The total 1,989 literature search encompassed six key databases: PubMed, MEDLINE, CINAHL, Cochrane Library, Library, and Scopus, spanning the years 2017 to 2022. Each database was searched using three predefined search syntaxes tailored to the research objectives. The results yielded a total of 206 researches from PubMed using Syntax 1 - 3, 314 from MEDLINE using Syntax 1 - 3, 402 from CINAHL using Syntax 1 - 3, 358 from Cochrane Library using Syntax 1 - 3, 491 from Library using Syntax 1 - 3, and 218 from Scopus using Syntax 1 - 3. This comprehensive search strategy aimed to identify relevant research articles exploring the impact of nursing care interventions on patient safety outcomes across diverse healthcare settings.

Selection of Studies
The selection of studies was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Initially, duplicate studies were identified and removed using reference management software. Subsequently, titles and abstracts of the remaining studies were screened against

predefined inclusion and exclusion criteria. Included studies underwent a full-text assessment to confirm eligibility, with reasons for exclusion documented at each stage of the selection process. Inclusion criteria involved studies published between 2017 and 2022, focusing on nursing care interventions and their impact on patient safety outcomes across various healthcare settings. Relevant factors included staffing levels, nurse-patient ratios, care coordination procedures, communication strategies, and adherence to evidence-based guidelines. Exclusion criteria encompassed studies not directly addressing nursing care interventions or patient safety outcomes, non-healthcare settings, and those lacking sufficient data or methodological rigor. Two reviewers conducted the selection process independently, with discrepancies resolved through discussion or consultation with a third reviewer when necessary. This rigorous selection approach, guided by the PRISMA guidelines, aimed to ensure transparency, reproducibility, and comprehensiveness in identifying high quality, relevant studies for the synthesis.

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In the process of identifying studies via databases and registers, a total of 1,989 records were obtained from six databases and six registers. Before screening, 871 duplicate records were removed, along with 821 records marked as ineligible by automation tools, and 247 records removed for other reasons. Subsequently, 50 records were screened, resulting in the exclusion of 12 records based on predefined criteria. Reports were sought for retrieval for 38 records, of which 20 were assessed for eligibility. Among these, 18 reports were not retrieved, and 4 were excluded due to being

grey literature and 6 due to not being in full text. Finally, 10 studies were included in the review. This systematic process ensured a comprehensive and rigorous selection of relevant studies for further analysis and synthesis.

Quality Assessment of Studies

The quality assessment of studies involved a thorough evaluation of methodological rigor, internal validity, and risk of bias to determine the reliability and trustworthiness of the included research. This assessment was conducted using established criteria relevant to the study designs employed in the selected studies, such as randomized controlled trials, observational studies, or qualitative research. Criteria for assessment included study design, sample size, participant characteristics, data collection methods, analysis techniques, and adherence to reporting guidelines. Independent reviewers critically appraised each study, with discrepancies resolved through discussion or consultation with a third reviewer when necessary. The quality assessment process aimed to ensure that only studies meeting high methodological standards were included in the synthesis, enhancing the credibility and validity of the findings and conclusions drawn from the review.

#	Author	Are the selection of studies described and appropriate	Is the literature covered all relevant studies	Does method section described?	Was findings clearly described?	Quality rating
1	Melnyk et al	Yes	Yes	Yes	Yes	Good
2	Assaye et al	Yes	Yes	Yes	Yes	Good
3	Recio-Saucedo	Yes	Yes	Yes	Yes	Good
4	Mackey & Bassendowski	Yes	Yes	Yes	Yes	Dood
5	Boamah et al	Yes	Yes	Yes	Yes	Good
6	Alotaibi & Federico	Yes	Yes	Yes	Yes	Good
7	Müller et al	Yes	No	Yes	Yes	Fair
8	Simamora & Fathi	NO	Yes	Yes	Yes	Good

| 9 | Bates & Singh | Yes | Yes | Yes | Yes | Good |
| 10 | Liu et al | Yes | No | Yes | Yes | Fair |

The quality assessment of the studies reviewed revealed consistent strengths in the selection of studies, description of the literature, methodological sections, and clarity of findings across most of the studies. Authors Melnyk et al, Assaye et al, Recio-Saucedo, Mackey & Bassendowski, Boamah et al, Alotaibi & Federico, Simamora & Fathi, Bates & Singh demonstrated robustness in all evaluated aspects, thus warranting a rating of "Good." However, studies by Müller et al and Liu et al exhibited some shortcomings. While Müller et al lacked coverage of all relevant literature, Liu et al had issues with the clarity of findings. Consequently, these studies received ratings of "Fair." Overall, the majority of the studies demonstrated strong methodological rigor and clear reporting, providing a solid foundation for synthesizing evidence on the impact of nursing care on patient safety outcomes.

Data Synthesis

The data synthesis involved reviewing and analyzing the findings from ten selected studies on the impact of nursing care interventions on patient safety outcomes. Each study was assessed based on criteria such as the selection of studies, coverage of literature, description of methods, clarity of findings, and overall quality rating. Despite variations in study design and methodology, consistent themes emerged regarding the effectiveness of nursing care interventions in promoting patient safety across diverse healthcare settings. The synthesis highlighted the importance of factors such as staffing levels, nurse-patient ratios, care coordination procedures, communication strategies, and adherence to evidence-based guidelines in influencing patient safety outcomes. While most studies demonstrated strong methodological rigor and clear reporting, a few exhibited shortcomings, emphasizing the need for further research to address gaps in the literature. Overall, the data synthesis provided valuable insights into the relationship between nursing care and patient safety, informing evidence-based practices for improving patient outcomes and healthcare delivery.

Table 3: Research Matrix

Study	Aim	Study Design	Sample Size	Sampling	Results	Conclusion	Recommendation
Melnyk et al, 2018	To describe the state of EBP competency in U.S. nurses and determine factors associated with it	Descriptive Study	2,344 nurses	Anonymous online survey	Nurses reported low competency in meeting EBP competencies, with younger and more educated nurses reporting higher competency. Strong positive associations found with EBP beliefs and mentorship.	There's a need to enhance nurses' EBP skills for better care quality and patient outcomes.	Academic programs should ensure EBP competency at graduation; healthcare systems should set it as a standard for all clinicians.
Assaye et al, 2022	To measure missed nursing care levels and its relationship with nurse staffing and patient safety	Observational Study	517 patients	Survey of nurses and medical record review	High levels of missed nursing care were associated with hospital type and nurses' weekly work hours. Increased missed care led to higher incidence of adverse patient outcomes.	Higher levels of missed nursing care correlated with adverse patient safety outcomes, necessitating improved staffing and resource allocation.	Hospitals should monitor nursing practice, improve staffing levels, and allocate resources for essential nursing care activities.
Recio-Saucedo et al, 2018	To review the impact of missed nursing care on	Systematic Review	14 studies	Medline, CINAHL, Scopus	Mixed evidence on the impact of missed care on patient outcomes; associations found with	There's a modest evidence base on missed care and patient outcomes,	Hospitals should monitor nurses' reports of missed care, considering it

	adult patient outcomes				patient satisfaction, medication errors, infections, falls, pressure ulcers, and readmissions.	necessitating further research with objective measures.	as a quality and safety indicator, and conduct further research with objective measures.
Mackey & Bassendowski, 2017	To explore the history and importance of evidence-based practice in nursing education and practice	Review	Not applicable	Not applicable	Evidence-based practice is foundational to nursing education and practice, bridging the theory-practice gap.	Nurses should be proactive in acquiring research knowledge, implementing best practice guidelines, and utilizing technological advances.	Nurses should actively seek research knowledge and utilize best practice guidelines and technological advances to bridge the theory-practice gap.
Boamah et al, 2018	To investigate the effects of nurse managers' transformational leadership on job satisfaction and patient safety outcomes	Cross-sectional Study	378 acute care nurses	Random sample survey	Transformational leadership positively influenced workplace empowerment, job satisfaction, and patient safety outcomes.	Transformational leadership enhances workplace conditions, leading to better safety outcomes for patients and nurses.	Managers should utilize transformational leadership to create conditions promoting better safety outcomes for patients and nurses.
Alotaibi & Federico, 2017	To review the impact of health information technology on patient safety	Review	Not applicable	Not applicable	Health information technology improves patient safety by reducing medication errors, adverse drug reactions,	Health information technology is crucial for improving	Healthcare organizations should invest in health information technology

					and improving guideline adherence.	healthcare quality and safety.	selectively, considering its impact on patient safety outcomes.
Müller et al, 2018	To summarize the impact of SBAR communication tool on patient safety	Systematic Review	8 studies	PUBMED, EMBASE, CINAHL, Cochrane Library, PsycINFO	Moderate evidence for improved patient safety through SBAR implementation, especially for telephone communication.	Further research with high-quality measures is needed on SBAR's impact on patient safety.	SBAR implementation improves patient safety, especially in telephone communication; more high-quality research is needed on its impact.
Simamora & Fathi, 2019	To explore the effect of training on SBAR communication for improving patient safety	Quasi-experimental	Not applicable	Intervention and control groups	Training on SBAR communication significantly improved nurses' commitment to implementing it during handover.	Educational programs for nursing handoff communication should be implemented to improve patient safety.	Standard training programs for nursing handoff communication should be developed and implemented to improve patient safety.
Bates & Singh, 2018	To assess progress and emerging priorities in patient safety	Review	Not applicable	Not applicable	Despite progress, preventable harm remains high in healthcare. New approaches are needed to measure and address patient harm effectively.	New scientific and policy approaches are imperative for addressing both prior and emerging	Investments in methods to measure and predict patient harm are necessary for

						risk areas in patient safety.	improving patient safety.
Liu et al, 2018	To explore the impact of hospital nursing organizational factors, workload, nursing care left undone, and nurse burnout on patient safety	Cross-sectional Study	1,542 nurses	Random sampling	Better work environment and lower workload were associated with improved patient safety, mediated by less nursing care left undone and nurse burnout.	Improving work environment, staffing levels, and support for nurses can enhance patient safety.	Hospitals should focus on improving work environment, staffing levels, and support for nurses to enhance patient safety.

The studies provided encompass a diverse range of topics within nursing practice and patient safety. Melnyk et al. (2018) highlighted the need to enhance nurses' evidence-based practice (EBP) skills, emphasizing the importance of incorporating EBP competency into academic programs and healthcare standards. Assaye et al. (2022) shed light on the adverse outcomes associated with missed nursing care, stressing the necessity for improved staffing and resource allocation to mitigate patient safety risks. Recio-Saucedo et al. (2018) conducted a systematic review on missed nursing care, calling for further research with objective measures to better understand its impact on patient outcomes. Mackey & Bassendowski (2017) emphasized the foundational role of evidence-based practice in nursing education and practice, advocating for nurses to actively engage in research and implement best practice guidelines. Boamah et al. (2018) explored the positive influence of transformational leadership on job satisfaction and patient safety outcomes, suggesting that managers should leverage such leadership styles to create safer healthcare environments. Alotaibi & Federico (2017) reviewed the impact of health information technology on patient safety, emphasizing its crucial role in improving healthcare quality and safety, albeit with selective investment. Müller et al. (2018) summarized the impact of the SBAR communication tool on patient safety, calling for further high-quality research to understand its effectiveness fully. Simamora & Fathi (2019) investigated

the effect of training on SBAR communication for improving patient safety, suggesting the implementation of standard training programs to enhance patient safety during handover. Bates & Singh (2018) assessed progress and emerging priorities in patient safety, advocating for new scientific and policy approaches to address both existing and emerging risk areas effectively. Liu et al. (2018) explored the impact of hospital nursing organizational factors on patient safety, emphasizing the importance of improving work environment, staffing levels, and support for nurses to enhance patient safety. Overall, these studies underscore the multifaceted nature of patient safety and the need for comprehensive approaches to address various factors influencing it within healthcare settings.

Results

Table 3: Results indicating themes, Sub-themes, Trends, and explanation.

Theme	Sub-theme	Trend	Supporting Selected Studies	Explanation
Evidence-Based Practice Competency	Competency Levels	Low competency levels among nurses	Melnyk et al. (2018)	Overall, nurses reported low competency in meeting evidence-based practice (EBP) competencies, indicating a need for improvement in EBP skills and knowledge.
Missed Nursing Care	Missed Care Levels	High levels of missed nursing care	Assaye et al. (2022), Recio-Saucedo et al. (2018)	Studies found high levels of missed nursing care in acute care settings, suggesting potential risks to patient safety and highlighting the importance of addressing staffing and resource allocation issues.
Transformational Leadership	Leadership Influence	Positive influence on workplace empowerment, job satisfaction, and patient safety outcomes	Boamah et al. (2018)	Transformational leadership behaviors positively impacted workplace conditions and patient safety outcomes, indicating the significance of effective leadership in healthcare settings.
Health Information Technology	Impact on Patient Safety	Improvement in patient safety outcomes	Alotaibi & Federico (2017)	Health information technology was associated with reductions in medication errors and adverse drug reactions, indicating its potential to enhance patient safety in healthcare settings.
SBAR Communication Tool	Effectiveness in Patient Safety Improvement	Moderate evidence for improved patient safety	Müller et al. (2018)	Implementation of the SBAR communication tool showed moderate evidence for improving patient safety, particularly in telephone communication, suggesting its potential as a communication strategy to enhance patient safety.

Training on SBAR Communication	Effect on Nurse Commitment	Increased commitment to implementing SBAR communication	Simamora & Fathi (2019)	Training on SBAR communication significantly improved nurses' commitment to implementing it during handover, indicating the effectiveness of educational programs in promoting patient safety practices.
Patient Safety Progress	Assessment of Progress	Continued challenges in addressing preventable harm	Bates & Singh (2018)	Despite progress, preventable harm remains high in healthcare, necessitating new scientific and policy approaches to address existing and emerging risk areas effectively.
Work Environment and Staffing Levels	Effect on Patient Safety	Association with improved patient safety outcomes	Liu et al. (2018)	Improved work environment and staffing levels were associated with better patient safety outcomes, highlighting the importance of optimizing work conditions and staffing levels to enhance patient safety in healthcare settings.

The synthesized evidence across various themes reveals significant insights into enhancing patient safety within healthcare settings. Firstly, concerning Evidence-Based Practice (EBP) competency, studies indicate a concerning trend of low competency levels among nurses, emphasizing the urgent need for improving EBP skills and knowledge. Additionally, the prevalence of missed nursing care highlights potential risks to patient safety, underscoring the importance of addressing staffing and resource allocation issues. Transformational leadership emerges as a crucial factor positively influencing workplace conditions and patient safety outcomes, suggesting the significance of effective leadership in healthcare. Moreover, the implementation of health information technology shows promise in reducing medication errors and adverse drug reactions, thereby enhancing patient safety. Effective communication strategies such as the SBAR tool and training programs further contribute to improving nurse commitment and patient safety practices. Despite progress, challenges persist in addressing preventable harm, necessitating continuous efforts to optimize work environments and staffing levels for better patient safety outcomes.

Discussion

The findings of the present study are strongly reinforced by an extensive array of meticulously selected studies across various themes, offering profound insights into the imperative task of enhancing patient safety within the complex and dynamic landscape of healthcare settings. Firstly, concerning the critical domain of Evidence-Based Practice (EBP) competency, the study by Melnyk et al. (2018) underscores the sobering reality of persistently low competency levels among nurses, which vividly underscores the pressing need for robust interventions aimed at augmenting EBP skills and knowledge. This underscores the significance of educational initiatives and organizational support systems designed to empower nurses in seamlessly integrating research evidence into their daily practice, thereby enhancing the quality and safety of patient care delivery.

Moreover, the compelling studies conducted by Assaye et al. (2022) and Recio-Saucedo et al. (2018) meticulously shed light on the pervasive issue of missed nursing care and its disturbing correlation with adverse patient outcomes, thereby underscoring the indispensable role of judicious staffing levels and prudent resource allocation in ameliorating risks to patient safety within healthcare environments.

Furthermore, the transformative influence of visionary leadership, as elucidated by Boamah et al. (2018), cannot be overstated, as it unequivocally correlates with enhanced workplace empowerment, heightened job satisfaction, and improved patient safety outcomes. This underscores the paramount importance of cultivating a leadership culture that fosters a climate of safety and continuous improvement within healthcare organizations.

Additionally, the seminal work by Alotaibi & Federico (2017) highlights the immense potential of health information technology in revolutionizing patient safety by mitigating medication errors and adverse drug reactions, thus heralding a new era of data-driven clinical decision-making and streamlined communication pathways.

Moreover, the effectiveness of robust communication strategies, such as the Situation-Background-Assessment-Recommendation (SBAR) tool, as elucidated by Müller et al. (2018), and the catalyzing impact of targeted training programs on

SBAR communication, as evidenced by Simamora & Fathi (2019), cannot be overstated. These findings underscore the paramount importance of standardized communication protocols and ongoing educational initiatives in nurturing a culture of effective teamwork and patient-centered care.

Despite these commendable strides, challenges in mitigating preventable harm persist, as cogently discussed by Bates & Singh (2018). Hence, it is incumbent upon healthcare stakeholders to embark on a relentless quest to optimize work environments and staffing levels to engender a culture of safety and excellence, thereby ensuring better patient safety outcomes. In essence, the synthesis of evidence from these meticulously curated studies underscores the multifaceted nature of patient safety and the indispensable role of a holistic approach encompassing organizational, leadership, technological and educational dimensions in safeguarding patient well-being and mitigating risks in healthcare settings.

Limitation

While the present study provides valuable insights into the multifaceted realm of patient safety, it is essential to acknowledge certain limitations inherent in the research process. Firstly, the reliance on existing literature and selected studies may introduce bias, as the inclusion criteria and methodologies of these studies vary. Additionally, the scope of the study may not encompass all relevant themes or sub-themes, potentially overlooking crucial aspects of patient safety. Moreover, the generalizability of findings may be limited by the diverse contexts and settings represented in the selected studies, necessitating caution in extrapolating conclusions to broader healthcare contexts.

Recommendation

Several recommendations emerge to inform future research and practice endeavors aimed at enhancing patient safety. Firstly, there is a pressing need for longitudinal studies and multi-site investigations to elucidate temporal trends and contextual nuances in patient safety outcomes. Additionally, efforts should be directed towards developing standardized measurement tools and assessment frameworks to facilitate comparability and consistency across studies. Furthermore, interdisciplinary collaboration and

knowledge exchange forums should be fostered to leverage diverse perspectives and expertise in addressing complex patient safety challenges comprehensively.

Conclusion

The present study underscores the critical imperative of prioritizing patient safety within healthcare systems worldwide. Through a meticulous synthesis of evidence from selected studies across various themes, valuable insights have been gleaned into the multifaceted determinants and dynamics shaping patient safety outcomes. Despite inherent limitations, the findings underscore the indispensable role of evidence-based interventions, transformative leadership, technological innovations, and robust communication strategies in fostering a culture of safety and excellence within healthcare organizations. Moving forward, concerted efforts must be made to translate these insights into actionable strategies and policies aimed at safeguarding patient well-being and advancing the quality and safety of healthcare delivery on a global scale.

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