

"How Nursing Theory Informs Implementation Science: A Systematic Review of Evidence-Based Practices and Nurse-Led Initiatives for Sustainable Healthcare"

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Abstract

Aim: This systematic review aims to explore the intersection of nursing theory and implementation science, focusing on evidence-based practices (EBPs) and nurse-led initiatives for sustainable healthcare.

Background: Nursing theory provides a conceptual framework for understanding patient care, while implementation science offers methods to integrate research findings into practice. Understanding how nursing theory informs implementation science is crucial for advancing healthcare delivery.

Design: A comprehensive literature review was conducted to identify relevant studies and nurse-led initiatives that exemplify the integration of nursing theory and implementation science.

Data Sources: PubMed, CINAHL, Scopus, and PsycINFO databases were systematically searched for relevant articles published between 2010 and 2024.

Method: Studies were selected based on predefined inclusion criteria, including relevance to nursing theory, implementation science, and sustainable healthcare. Data extraction and synthesis were performed to identify key themes and findings.

Results: The review identified a diverse range of nurse-led initiatives that leverage nursing theory to inform the implementation of EBPs. These initiatives encompassed various healthcare settings and addressed a wide range of patient needs, demonstrating the versatility and applicability of nursing theory in practice.

Conclusions: Nursing theory serves as a valuable foundation for implementation science, guiding the development and application of EBPs in healthcare settings. Nurse-led initiatives that integrate nursing theory and implementation science have the potential to enhance patient outcomes and promote sustainable healthcare delivery.

Implications for the Profession and/or Patient Care: Understanding the synergy between nursing theory and implementation science can inform nursing practice, education, and policy development. By incorporating theoretical insights into implementation efforts, nurses can contribute to more effective and sustainable patient care.

Keywords: Nursing theory, implementation science, evidence-based practices, nurse-led initiatives, sustainable healthcare, patient care, healthcare delivery, systematic review.

1. INTRODUCTION

The integration of nursing theory into implementation science is pivotal for advancing evidence-based practices (EBPs) and ensuring the sustainability of nurse-led initiatives in healthcare. Implementation science, which has evolved since the 1930s, employs explicit theories and analytic frameworks to evaluate health interventions rigorously, emphasizing the need for fidelity assessment, process evaluation, and complex evaluation to understand intervention effectiveness in diverse contexts (Ridde et al., 2020). Despite the growing use of theory in implementation science, gaps remain in understanding how successful EBP implementation occurs within healthcare organizations, particularly through the lens of organizational theory and effective knowledge-sharing networks (Rangachari, 2020). Sustainability, defined as the continued use of an initiative post-implementation, is a critical yet under-researched area, with factors such as customization to context, staff engagement, and value congruency playing significant roles in sustaining initiatives like Lean in pediatric healthcare (Flynn & Scott, 2020). Social Practice Theory has been instrumental in guiding mixed-methods evaluations of complex interventions, highlighting the importance of fidelity and tailoring to individual needs for optimal outcomes (Frost et al., 2020). Systematic reviews have identified key facilitators for sustained implementation, including clear accountability, strong leadership, and adequate organizational support, while inadequate staff resourcing remains a significant barrier (Cowie et al., 2020). The variability in sustaining EBPs across different settings underscores the need for comprehensive frameworks that consider innovation, leadership, and contextual factors (Nadalin Penno et al., 2019). Practitioner-level interventions, such as audit and feedback, have shown potential in changing nurses' behavior, though their effectiveness and the underlying mechanisms require further exploration. The fractured understanding of

sustainment due to inconsistent use of theories, models, and frameworks (TMFs) calls for improved reporting and utilization of TMFs to advance sustainment strategies (Birken et al., 2020). Evidence synthesis projects can enhance the replicability of successful interventions by systematically extracting implementation factors, thereby facilitating the spread of sustainable practices (A. Tierney et al., 2020). Finally, the multifaceted challenges in implementing EBPs in nursing, particularly in low and middle-income countries, highlight the need for further qualitative research to address power dynamics and other influencing factors (Jude N. Ominyi & David A. Agom, 2020). This systematic review aims to bridge these gaps by examining how nursing theory informs implementation science, ultimately contributing to sustainable healthcare practices.

2. BACKGROUND

Nursing theory plays a crucial role in informing implementation science by providing a structured framework to describe, explain, predict, and control nursing practices, which is essential for the systematic uptake of evidence-based practices (EBPs) in healthcare settings (Riley-Gibson et al., 2023). The integration of theories, models, and frameworks into implementation strategies helps in identifying barriers and facilitators, thereby enhancing the adoption and sustainability of EBPs. For instance, the Behaviour Change Wheel and the Theoretical Domains Framework (TDF) have been effectively used to design and adapt implementation strategies that target individual, organizational, and system-level determinants of change, promoting sustainability in diverse healthcare settings (Somya Gautam et al., 2022). Additionally, the use of behavioral theories has provided insights into the complex reasons behind healthcare professionals' adherence to clinical practice guidelines (CPGs), facilitating the development of more effective implementation strategies (Porat-Dahlerbruch et al., 2022). The systematic review of

sustainment strategies in clinical and community settings further underscores the importance of theory-driven approaches in maintaining the implementation of EBPs, which is critical for addressing chronic diseases and improving public health outcomes (Moullin et al., n.d.-a). In nursing and midwifery, implementation science has been increasingly utilized to translate research findings into routine practice, thereby improving the quality and effectiveness of health services. However, there is a need for more high-quality evidence and robust evaluation designs to close the gaps between evidence and practice, particularly in specialized settings like prison (Setswe & Zungu, 2022). The perspective framework for evidence-based management in healthcare organizations also highlights the importance of monitoring and tailoring EBPs to enhance their impact and sustainability (Sales et al., 2022). Overall, the integration of nursing theory with implementation science not only facilitates the adoption of EBPs but also ensures their long-term sustainability, ultimately leading to better healthcare outcomes.

3.OVERVIEW OF ISSUES

This systematic review examines the intersection of nursing theory and implementation science in promoting evidence-based practices and nurse-led initiatives for sustainable healthcare. Key issues include the translation of theoretical frameworks into practical applications, the role of nurses in driving healthcare innovations, and the challenges in sustaining these initiatives. The review highlights barriers such as resource limitations, resistance to change, and the need for ongoing education and support. It underscores the importance of integrating nursing theory with implementation science to enhance patient outcomes, optimize care delivery, and ensure the long-term viability of healthcare interventions.

3.1. Nursing theory inform the implementation of evidence-based practices in healthcare settings.

Nursing theory significantly influences the development of evidence-based practices

(EBP) in healthcare settings by providing a structured framework that guides the integration of research evidence into clinical practice (see **table 1**). Theories in nursing, which consist of interconnected concepts, definitions, models, assertions, and assumptions, offer an organized, explanatory, and predictive perspective of phenomena, enabling nurses to describe, explain, predict, and control practice (Somya Gautam et al., 2022). The shift from theory development to theory utilization has led to various scholarly approaches that enhance the quality of patient care and professional status of nurses (Lockwood, 2017). Theories help in identifying and overcoming barriers to EBP implementation, such as lack of time, skills, and resources, by providing a systematic approach to integrating research evidence with clinical expertise and patient preferences (Alatawi et al., 2020). For instance, the Single-Session Intervention approach, grounded in theoretical frameworks like the Theoretical Domains Framework (TDF), offers a low-cost and scalable strategy to promote individual-level behavior change among clinicians, thereby facilitating EBP uptake and sustainment. Additionally, theory-informed models, such as those used by the Joanna Briggs Collaboration, integrate evidence synthesis, transfer, and implementation, aligning with local culture and context to improve healthcare policy and practice (S. W. Lee, 2014). The use of nursing theories in educational settings, as seen in the Knowledge in Development (KID) project, underscores the importance of theory in planning and implementing development projects, thereby enhancing the competencies of nursing students and professionals in EBP (Dalheim et al., 2012a). However, a lack of theoretical knowledge among nursing staff and students can hinder the effective application of EBP, highlighting the need for hospitals and nursing schools to adopt and link theoretical models to practice settings (Tang et al., 2022). Overall, nursing theories provide the foundational knowledge and systematic approach necessary for the successful implementation and sustainment of evidence-based practices in healthcare settings.

Table 1 : Illustrating how nursing theory informs the implementation of evidence-based practices (EBPs) in healthcare settings

Nursing Theory	Key Concepts	Implementation Science Framework	Evidence-Based Practice	Nurse-Led Initiatives	Sustainable Healthcare Outcomes
Orem's Self-Care Deficit Nursing Theory (Tang et al., 2022)	Self-care, pain assessment, stress response	Combined with active pain assessment for improved outcomes	Significant improvement in pain control, stress, and psychological state in children post-surgery	Improved pain control, stress response, psychological state, and sleep quality in children	Reduces pain and stress, improves psychological state and sleep quality in children
Meleis' model (Figueiredo Santos et al., 2022)	Human being as a complex unity with integrated characteristics	Meleis' model confirms utility of Orem's theory in practice	Theory guides nursing practice with clear concepts and assumptions	Effective guidance for nursing practice with varying systems based on patient's self-care capacity	Enhances nursing practice through adaptable care systems, promoting patient in
Peplau's Interpersonal Relationship Theory (Astrês Fernandes et al., 2018)	Interpersonal relationships, individualized care	Applied in nursing care for schizophrenia patients	Led to individualized care addressing real patient needs	Effective psychiatric interventions through building necessary bonds	Improved mental health nursing care, enhancing patient interactions and care quality
Watson's Theory of Human Carin (Ibahnasawy et al., 2016)	Caring as essence of nursing	Application in pediatric critical care unit	Significant improvement in nurses' Caring Behavior Assessment scores post-intervention	In-service training programs for nurses to improve caring behavior	Improved caring behavior and communication, better patient outcomes through enhanced nurse training
Neuman's Systems Model (Akhlaghi et al., 2020)	Moderating stressors, prevention levels	Neuman-based program for CABG patients	Effective in reducing patient stress before surgery	Nurse-led intervention reducing stress in patients awaiting CABG	Low-cost and effective stress reduction, improving patient readiness and outcomes in surgery
Rogers' Science of Unitary Human Beings (Phillips, 2010; Wright)	Unitary human beings, energy fields, pan-dimensionality	Universal framework consistent with professional nursing	Color breathing and self-transcendence practices for wellbeing	Nurse-led initiatives such as color breathing for patient wellbeing	Emphasizes alive universe, contributing to holistic and sustainable healthcare outcomes
Benner's Novice to Expert Model (Basu, n.d.)	Mastery development stages, Bloom's taxonomy	Mastery rubric and graduated challenges for expertise development	Feedback essential in deliberate practice for evidence-based practice success	Training nurses through graduated challenges and mastery development	Enhances nurse training and practice, leading to higher competence and improved patient care

4. METHODOLOGY

4.1. Design

The research adopted a mixed methodology in conducting a systematic review through the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (**supplementary file 1**) framework (Page et al., 2021). This study utilized a systematic review approach to examine the intersection of nursing theory and implementation science in nurse-led initiatives for sustainable healthcare. A comprehensive literature review was conducted to identify and synthesize relevant studies.

4.2. Data Sources:

The following databases were systematically searched for relevant articles published between 2000 and 2024: PubMed, CINAHL (Cumulative Index to Nursing and Allied Health Literature), Scopus, PsycINFO

4.3. Search Strategy:

A combination of keywords and MeSH (Medical Subject Headings) terms related to nursing theory, implementation science, evidence-based practices, nurse-led initiatives, and sustainable healthcare was used to identify relevant studies. The search terms included but were not limited to: "Nursing theory" "Implementation science" "Evidence-based practice" "Nurse-led initiatives" "Sustainable healthcare" "Self-care theory" "Interpersonal relationship theory" "Human caring theory" "Systems model" "Unitary human beings" "Novice to expert model".

4.4. Inclusion and Exclusion Criteria:

Studies were selected based on the following inclusion criteria: Published in English between 2010 and 2024, Focused on the integration of nursing theory and implementation science, included nurse-led

initiatives aimed at improving healthcare outcomes, utilized evidence-based practices, and Addressed sustainability in healthcare.

4.5. Exclusion criteria included:

Studies not related to nursing theory or implementation science, Articles without full-text availability, Studies published before 2010, non-peer-reviewed sources, such as opinion pieces or editorials.

4.6. Data Extraction and Synthesis:

Data from the selected studies were extracted using a standardized form, capturing the following information: Author(s) and year of publication, Nursing theory applied Key concepts of the theory, Implementation science framework utilized, Description of the nurse-led initiative, Evidence-based practices employed, Reported healthcare outcomes, Implications for sustainable healthcare.

The extracted data were synthesized to identify common themes, best practices, and key findings regarding the integration of nursing theory and implementation science. A thematic analysis was conducted to categorize and interpret the data, focusing on how theoretical insights informed the implementation of evidence-based practices in nurse-led initiatives.

4.7. Quality Appraisal:

The research applied the Long and Godfrey Individual Assessment Instrument to evaluate 18 studies for methodological rigor, validity, relevance, and potential biases. (See **table 2**) Ratings ranged from 5+ (very excellent quality) to 4+ (adequate quality). Out of 18 studies, 8 were of adequate quality and 10 were of good quality, characterized by robust methodology, theoretical frameworks, and practical results.

Table 2: Individual article assessment rating based on Long and Godfrey, 2004 tool
Evaluation of included study

Bibliography details	Purpose	Key findings	Evaluative summary	Quality assessment**
Tang et al., 2022	1+	1+	3+	5+

Bibliography details	Purpose	Key findings	Evaluative summary	Quality assessment**
Riley-Gibson et al., 2023	1+	1+	2+	4+
Somya Gautam et al., 2022	1+	1+	2+	4+
Alatawi et al., 2020	1+	1+	2+	4+
S Sarawad, 2023	1+	1+	3+	5+
Schleider & Beidas, 2022	1+	1+	3+	5+
Degu et al., 2022	1+	1+	3+	5+
Abu-Baker et al., 2021	1+	1+	3+	5+
Baltzell et al., 2017	1+	1+	3+	5+
Klopper & Hill, 2015	1+	1+	3+	5+
Malabat & Ruiz, 2019	1+	1+	3+	5+
Hulett et al., 2022	1+	1+	3+	5+
Aronsson et al., 2020	1+	1+	3+	5+
Bulto et al., 2023	1+	1+	3+	5+
Wojeck et al., 2023	1+	1+	2+	4+
Karrer et al., 2020	1+	1+	2+	4+

**Quality appraisal: 5+ good quality, 4+ sufficient quality

4.8. Ethical Considerations:

This systematic review did not involve primary data collection, so ethical approval was not required. However, the review adhered to ethical standards in research, ensuring accuracy, transparency, and respect for intellectual property by properly citing all sources.

4.9. Limitations:

Potential limitations of this study include Publication bias, as only peer-reviewed articles were included, Language bias, as only studies published in English were considered, the variability in the application

and reporting of nursing theories and implementation science frameworks across different studies.

4.10. Research questions.

Based on the guidelines obtained from The University of North Carolina at Chapel Hill Libraries System, the present study developed research questions relevant by the [SPIDER (S-Sample, PI-Phenomenon of Interest, D-Design, E-Evaluation, R-Research Type)] framework,(UNC-Chapel Hill Libraries. Available from: <https://library.unc.edu/2023>) as indicated in **Table 3**.

Table 3: Research questions framed according to SPIDER protocol

SPIDER	Element	Included terms
S	Sample	Nurses, nurse-led teams, healthcare professionals involved in implementation science, patients receiving nurse-led care.

SPIDER	Element	Included terms
PI	Phenomenon of interest	The role of nursing theory in informing implementation science, evidence-based practices, and nurse-led initiatives in sustainable healthcare.
D	Design	Systematic reviews, qualitative studies, quantitative studies, mixed-methods studies, case studies, pilot projects.
E	Evaluation	Effectiveness of evidence-based practices, sustainability of healthcare initiatives, improvements in patient outcomes, adoption and adherence to nursing theories, impact on healthcare delivery.
R	Research type Research questions	How does the application of nursing theory inform the implementation of evidence-based practices in healthcare settings? What are the outcomes of nurse-led initiatives on the sustainability of healthcare practices? In what ways do evidence-based practices guided by nursing theory improve patient care outcomes? What challenges and facilitators are associated with the implementation of nurse-led, theory-informed practices in healthcare settings? How do nurse-led initiatives contribute to the adoption and adherence to nursing theories in healthcare practices?

5. RESULT

The implementation of Evidence-Based Practice (EBP) in healthcare is influenced by a range of factors, including attitudes, beliefs, knowledge, and organizational obstacles such as facilities, leadership, conflict, and culture. To address these challenges, three evidence-based strategies for sustainable change have been proposed, focusing on communication, support, and clear implementation planning. The Single-Session Intervention approach shows promise for behavior change, especially in diverse clinical and community contexts, although future research is warranted. Middle managers play a crucial role in shaping implementation climate and fulfilling various roles in EBP implementation.

While nurse managers are influential in creating a supportive culture for EBP, studies have identified a lack of instruments with strong psychometric evidence related to implementation outcomes. Nurse-led interventions are effective in improving

access to care, but nurses face obstacles like work overload and resistance to change, necessitating support from higher education and therapeutic units. Customizing interventions to unit culture is crucial for sustainability, as clinician understanding promotes sustainment.

However, there's a gap in integrating Community Health Workers (CHWs) into settings due to limited use of implementation theories. The sustainability of interventions is a key focus, with various frameworks and models identified to inform practice. Nurse leaders play a vital role in supporting Implementation Science for EBP and preparing an IS-ready workforce. High levels of sustainability are reported with appropriate organizational variables and training methods.

While positive attitudes towards implementing evidence into practice are prevalent, barriers persist, including lack of time and knowledge. Nurse research contributes significantly to EBP, but there's room for improvement in integrating

implementation science. The development and evaluation of evidence-based implementation and sustainability toolkits offer a systematic approach to change. Additionally, sustainable healthcare systems require addressing challenges and leveraging feasible solutions.

Overall, there's a growing understanding of sustainment factors, with recommendations for future research and practice. Nurses and nurse scientists are pivotal in advancing implementation science, with international resources available for learning and collaboration. Systematic reviews and studies aim to bridge theory and practice while addressing conceptual and methodological issues in studying sustainability.

5.1. The application of nursing theory informs the implementation of evidence-based practices in healthcare settings.

The application of nursing theory plays a crucial role in informing the implementation of evidence-based practices in healthcare settings. Nursing research contributes significantly to generating scientific knowledge for evidence-based clinical practice (S Sarawad, 2023), and evidence-based practice (EBP) is recognized as essential for improving healthcare quality and patient outcomes (Moullin et al., n.d.-b). The Single-Session Intervention approach is proposed as a low-cost and scalable strategy for implementing EBP, particularly targeting individual-level behavior change (Schleider & Beidas, 2022). Despite the challenges nurses face in implementing EBP, evidence-informed practice (EIP) has been suggested as an alternative approach to enhance the transfer of evidence into practice, providing a systems-based model for applying evidence in clinical nursing practice (Degu et al., 2022a). By integrating nursing theory with evidence-based practices, healthcare settings can enhance the quality of care, reduce expenses, and empower the healthcare workforce with differentiated research skills (Smith-Miller, 2022).

5.1.1. Nursing theories influence evidence-based healthcare practices

Nursing theories play a crucial role in influencing evidence-based healthcare practices by providing a framework for understanding the complexities of implementing evidence into clinical settings. Research indicates that integrating behavioral theories can help identify barriers and facilitators to adherence to clinical practice guidelines (Dalheim et al., 2012b), ultimately improving patient care and reducing practice variation. Additionally, studies highlight that nurses often rely on experiential knowledge rather than research evidence, with barriers such as lack of time and skills hindering the utilization of research findings in practice (CHIEN, 2019). Training in evidence-based practice is essential for nursing students to bridge the gap between belief in evidence-based knowledge and its implementation in clinical settings (Abu-Baker et al., 2021). By enhancing nurses' competencies, knowledge of evidence-based nursing, and information searching abilities, along with providing necessary resources and support from the administration, healthcare institutions can promote the integration of evidence-based practices effectively (Stewart et al., 2023a).

5.1.2. Nursing theories be applied globally in healthcare.

Nursing theories play a crucial role in shaping healthcare practices globally, as evidenced by various research papers. The Global Advisory Panel on the Future of Nursing (GAPFON) emphasizes the importance of nursing in advancing global health through reform, advocacy, and innovation (Baltzell et al., 2017). Additionally, theories such as Rubin's tasks of pregnancy and Mercer's grief work in postpartum can guide maternity nurses to provide sensitive and holistic care during pregnancy and postpartum periods (Klopper & Hill, 2015). Furthermore, in response to global health emergencies like nuclear incidents, the proposal to develop a nuclear global health workforce highlights the

critical role nurses play in leadership and healthcare effectiveness during public health emergencies (Côté-Arsenault & Hubbard, 2019a). Overall, nursing theories not only enhance critical thinking and care quality but also contribute significantly to addressing healthcare challenges on a global scale.

5.1.2. language barriers affect the global application of nursing theories.

Language barriers significantly impact the global application of nursing theories by hindering effective communication and understanding in healthcare settings (Mangal & Farmer, 2023) (Veronica, 2018). Studies emphasize the importance of language proficiency for nursing students to address these barriers and enhance their skills in global health, emphasizing the need for language training to improve healthcare outcomes locally and internationally (Malabat & Ruiz, 2019). Furthermore, the development and adaptation of nursing theories in cross-cultural contexts are impeded by language limitations, affecting the optimal application of theories in research, practice, and education globally (Squires et al., 2020). Efforts to strengthen transcultural nursing competencies among students are crucial to overcoming language barriers and promoting culturally competent care, highlighting the necessity of incorporating transcultural nursing in educational curricula to enhance theoretical and clinical experiences for future healthcare professionals (Štante et al., 2018).

5.2. The outcomes of nurse-led initiatives on the sustainability of healthcare practices

Nurse-led initiatives have shown significant positive outcomes on the sustainability of (Moustafa Saleh & Elsabahy, 2022) healthcare practices. Studies have indicated that integrating sustainability development education programs among nursing interns can lead to improvements in knowledge, attitudes, and behaviors related to sustainability. Additionally, evidence-based quality improvement projects initiated

by graduate nursing students in partnership with healthcare organizations have demonstrated continuous innovation and the promotion of evidence-based practices over time (Hulett et al., 2022). Nurses' views on environmentally responsible clinical practices emphasize effective material and energy use, with a focus on sustainable purchasing and waste reduction, highlighting the importance of stakeholder collaboration and necessary resources to promote environmental responsibility in clinical settings (Kallio et al., 2020). Furthermore, educational interventions focusing on sustainability in nursing curricula have been shown to significantly improve students' attitudes towards sustainability in the workplace, indicating the potential for long-term positive impacts on healthcare sustainability (Aronsson et al., 2020).

5.2.1. ways do nurse-led interventions improve healthcare quality

Nurse-led interventions have been shown to significantly enhance healthcare quality in various ways. These interventions contribute to improving patients' self-care abilities, reducing readmission rates, shortening hospital stays, decreasing complications, lowering anxiety and depression levels, enhancing self-management abilities, and improving quality of life (Faessler et al., 2023) (Lei et al., 2023). Additionally, nurse-led interventions have been effective in managing hypertension by significantly improving systolic and diastolic blood pressure, modifying diet and physical activity, and positively impacting patient knowledge. Furthermore, in patients with heart failure, nurse-led education programs have demonstrated a reduction in heart failure-related readmissions, improved quality of life, and decreased all-cause readmissions or mortality rates, emphasizing the importance of these programs in improving patient outcomes and prognosis (Bulto et al., 2023). Nurse-led interventions also play a crucial role in enhancing medication adherence, medication knowledge, and clinical outcomes in adults

at risk for metabolic syndrome, highlighting their effectiveness in improving healthcare quality in various patient populations (Tian et al., 2024a).

5.2.2. Nurse-led interventions impact patient outcomes

Nurse-led interventions have a significant impact on patient outcomes across various healthcare conditions. Studies have shown that nurse-led education programs for heart failure patients reduce HF-related readmissions by 25% and improve quality of life (Tian et al., 2024b). In systemic autoimmune rheumatic diseases, nurse-led interventions, including educational sessions and counselling, have led to improvements in health-related quality of life, fatigue, mental health, and self-efficacy (Wojeck et al., 2023). Additionally, nurse-led interventions for adults with metabolic syndrome have demonstrated moderate improvements in medication adherence, medication knowledge, and clinical outcomes, especially in studies of moderate to high quality (Scarton et al., 2023). These findings underscore the crucial role of nurses in enhancing patient care, disease management, and overall health outcomes through tailored interventions and education programs.

5.2.3. challenges do nurses face when implementing interventions

Nurses face various challenges when implementing interventions, as highlighted in the research papers. These challenges include organizational barriers such as lack of time, economic resources, and project fatigue (Taylor et al., 2022), difficulties in engaging with key stakeholders and managing the burden of practice change (Brautsch et al., 2022), factors affecting fidelity like staff behavior and familiarity with the setting (Parker et al., 2020), and barriers related to the complexity of interventions, organizational culture, and resources availability (Parker et al., 2020). Additionally, challenges arise from interpersonal barriers, such as communication difficulties between nurses

and patients, especially regarding sensitive topics like weight management (Karrer et al., 2020). Understanding these challenges is crucial for successful implementation of interventions in healthcare settings, emphasizing the need for tailored strategies to address these multifaceted barriers (Hirt et al., 2021).

5.2.4. nurses navigate resistance to new interventions.

Nurses navigate resistance to new interventions through various strategies and understandings. Resistance is seen as a response to perceived threats to baseline status, often amplified by mistrust and communication barriers, impacting the implementation and sustainability of change (Sahay & Goldthwaite, 2024). Nurses exercise power by resisting in situations of moral conflict, ensuring ethical values are upheld in practice (DuBose & Mayo, 2020). Additionally, nurses can leverage Faith as a Generalized Resistance Resource (GRR) to promote health benefits, highlighting the importance of educational training in this area for nursing students (Plant et al., 2000). Understanding resistance dynamics, utilizing empowerment strategies, and promoting faith as a resource can help nurses effectively manage and navigate resistance to new interventions in healthcare settings.

5.3. evidence-based practices guided by nursing theory improve patient care outcomes.

Evidence-based practices (EBPs) guided by nursing theory have shown positive impacts on patient care outcomes. Studies have highlighted that theory-based nursing interventions positively affect fasting blood glucose, body mass index, and quality of life in patients with coronary heart disease (Connor et al., 2023). Additionally, the implementation of EBPs has been associated with improved patient outcomes and return on investment in healthcare settings, with 94% of projects showing a positive return on investment and none showing a negative return (Gok Metin et al., 2023). Moreover,

the application of EBPs in nursing practice has been linked to increased quality of healthcare services, reduced costs, and enhanced clinical outcomes, emphasizing the importance of educational level, administrative support, attitude, and information sources in facilitating EBP implementation (Barnden et al., 2023a). Integrating EBP into nursing education is crucial to standardize practice, build knowledge, and ultimately improve patient outcomes (Degu et al., 2022b).

5.3.1. nursing theories influence evidence-based practices

Nursing theories play a crucial role in influencing evidence-based practices by shaping nurses' constructions and understandings of evidence-based practice, which can impact its implementation in clinical settings. Studies have shown that nurses often base their understanding of evidence-based practice on concepts derived from evidence-based medicine, leading to discrepancies between theoretical knowledge and practical application (Halberg et al., 2021). Additionally, beliefs in evidence-based practice are significantly influenced by training, research knowledge, job satisfaction, and educational background, ultimately affecting the implementation of evidence-based practices in different healthcare institutions (Skela-Savič & Lobe, 2021). Furthermore, nurse academics facilitate the integration of evidence-based practice into undergraduate curricula, emphasizing the importance of clinical application and collaboration between academia and practice to support students in applying evidence-based care effectively (Malik et al., 2017). Individual factors among staff nurses, such as knowledge, attitudes, and training, also play a significant role in the successful implementation of evidence-based practice, highlighting the need for ongoing education and support to promote nurses' involvement in evidence-based processes (Alqahtani et al., 2020). Moreover, factors like sources of knowledge, barriers, and self-reported skills influence the utilization of research evidence

in clinical practice, indicating that skills in evidence-based practice can reduce barriers and enhance the use of research evidence among nurses (Dalheim et al., 2012c).

5.3.2. Nursing theories guide clinical decision-making processes.

Nursing theories play a crucial role in guiding clinical decision-making processes by providing a framework for understanding the complexities involved. The systematic-positivist model and the intuitive-humanistic model are two predominant theoretical perspectives that influence nurses' decision-making (Wu, 2020). These models emphasize the integration of evidence-based knowledge with intuition and contextual factors to enhance clinical decision-making skills (Krishnan, 2018). Additionally, factors such as expertise, critical thinking disposition, and decision-making stress influence nurses' decision-making ability in hospital settings, highlighting the importance of analytical-systematic decision-making types and critical thinking disposition in improving decision-making skills among clinical nurses (Park et al., 2023). By incorporating theories and models into nursing education and practice, nurses can develop the necessary skills to make informed and effective decisions in dynamic healthcare environments (Dowding et al., 2012).

5.3.3. Nursing theories be applied across different healthcare settings

Nursing theories can indeed be applied across different healthcare settings, as evidenced by various research papers. The application of theory in nursing research is crucial for guiding practice and building knowledge (Lor et al., 2017). Nurses play a vital role in care coordination across different settings, such as hospitals and homes, particularly in improving care transitions for populations like stroke survivors (Camicia & Lutz, 2016). Interprofessional teams, where nurses are essential members, have been shown to enhance patient outcomes and reduce costs,

emphasizing the importance of recognizing nurses' contributions in diverse healthcare teams and settings (Will & Lamb, 2021). Additionally, the use of relevant theories can guide maternity nurses in providing holistic care and responding effectively to unique family situations during pregnancy and postpartum periods (Côté-Arsenault & Hubbard, 2019b). Overall, the application of nursing theories transcends various healthcare settings, contributing to improved patient care and outcomes.

5.4. challenges and facilitators are associated with the implementation of nurse-led, theory-informed practices in healthcare settings.

The implementation of nurse-led, theory-informed practices in healthcare settings faces various challenges and facilitators. Challenges include factors such as lack of access to reliable information, resource shortages, uncollaborative leadership styles, and communication barriers (Grivell et al., 2023). On the other hand, facilitators encompass staff resilience, commitment, and innovation, supported by collaborative feedback mechanisms between leadership and frontline staff (Silver et al., 2023). Additionally, time management, external motivation, expectations, and professional identity are crucial determinants for utilizing new screening tools in healthcare, with perceptions evolving over time (Wang et al., 2022). Understanding these barriers and facilitators is essential for successful integration of nurse-led, theory-informed practices in healthcare settings, emphasizing the importance of addressing organizational, individual, and contextual factors to ensure effective implementation.

5.4.1. Theory-informed practices be effectively evaluated in healthcare.

Theory-informed practices in healthcare can be effectively evaluated through a combination of methods such as using theoretical implementation frameworks (Kumah et al., 2022), conducting research-practice partnerships (RPPs) with a theory-

based approach (Barnden et al., 2023b), and integrating behavioral theories to investigate adherence to clinical practice guidelines (CPGs) (Malley et al., 2022). These approaches involve utilizing established theoretical frameworks, engaging in collaborative partnerships between research and practice, and applying behavioral theories to understand healthcare professionals' adherence behaviors. By employing these strategies, healthcare organizations can assess the impact of theory informed practices on processes of care, patient outcomes, and the overall effectiveness of interventions. Additionally, incorporating a theory-driven evaluation of professional practice models can provide valuable insights for refining implementation strategies and improving healthcare delivery (Stewart et al., 2023b).

5.4.2. technology play in evaluating healthcare practices.

Technology plays a crucial role in evaluating healthcare practices by enabling the assessment of outcomes, effectiveness, and efficiency of interventions. Digital health interventions (DHIs) present unique challenges for economic evaluations due to their evolving nature, requiring methodological adaptations in cost-effectiveness analyses (Gomes et al., 2022). Information technology (IT) and wearable sensors are transforming healthcare, necessitating more efficient and patient-centric randomized clinical trials to match the rapid innovation cycles of health technologies (Peterson & Harrington, 2018). Health information technology (HIT) evaluation frameworks emphasize the importance of considering human, organizational, and technological factors to assess the impact of technology on healthcare practices (T.-T. Lee, 2016). Additionally, a practice-centered approach to evaluating technologies like Electronic Patient Records (EPRs) and telemedicine focuses on how these tools alter daily care practices, offering advantages over outcome-centric models (Darking et al., 2014). Mobile

health technologies are utilized in cardiovascular care to support behavior change, with randomized controlled trials incorporating in-app usage data for real-time evaluation and updates (Gallagher & Zhang, 2021).

6. DISCUSSION

The integration of nursing theory into implementation science is crucial for advancing evidence-based practices (EBPs) and ensuring the sustainability of nurse-led initiatives in healthcare settings. This systematic review has highlighted several key themes and findings that underscore the importance of theoretical frameworks in guiding the implementation and sustainment of EBPs, ultimately contributing to improved healthcare outcomes.

6.1. The Role of Nursing Theory in Implementation Science

Nursing theories provide structured frameworks that guide the systematic uptake of EBPs in clinical practice. Theories such as the Behaviour Change Wheel and the Theoretical Domains Framework (TDF) have been effectively used to design and adapt implementation strategies targeting individual, organizational, and system-level determinants of change. These frameworks help identify barriers and facilitators to EBP adoption, thus enhancing sustainability in diverse healthcare settings (Somya Gautam et al., 2022).

For instance, the use of behavioral theories has provided insights into the complex reasons behind healthcare professionals' adherence to clinical practice guidelines (CPGs), facilitating the development of more effective implementation strategies (Porat-Dahlerbruch et al., 2022). Moreover, the integration of theories like Social Practice Theory has been instrumental in guiding mixed-methods evaluations of complex interventions, emphasizing the importance of fidelity, and tailoring to individual needs for optimal outcomes (Frost et al., 2020).

6.2. Barriers and Facilitators to EBP Implementation

The review identified several barriers to EBP implementation, including lack of time, skills, and resources among nursing staff. Organizational obstacles such as inadequate facilities, leadership issues, conflict, and culture also pose significant challenges. To address these barriers, evidence-based strategies focusing on communication, support, and clear implementation planning have been proposed.

Middle managers and nurse leaders play crucial roles in shaping the implementation climate and fulfilling various roles in EBP implementation. However, a lack of instruments with strong psychometric evidence related to implementation outcomes remains a significant barrier. Customizing interventions to unit culture and providing necessary resources and support are essential for sustaining EBPs (Cowie et al., 2020).

6.3. Sustainability of Nurse-Led Initiatives

Sustainability, defined as the continued use of an initiative post-implementation, is a critical yet under-researched area. Factors such as customization to context, staff engagement, and value congruency play significant roles in sustaining initiatives like Lean in pediatric healthcare (Flynn & Scott, 2020). The review highlights that high levels of sustainability are reported with appropriate organizational variables and training methods. Nurse-led interventions have shown significant positive outcomes, such as improving patients' self-care abilities, reducing readmission rates, and enhancing quality of life (Faessler et al., 2023).

However, there's a gap in integrating Community Health Workers (CHWs) into settings due to limited use of implementation theories. The sustainability of interventions is a key focus, with various frameworks and models identified to inform practice. Nurse leaders are vital in supporting Implementation Science for EBP and preparing an IS-ready workforce (Moullin et al., n.d.-b).

6.4. Challenges and Recommendations for Future Research

Nurses face various challenges when implementing interventions, including organizational barriers, stakeholder engagement, and the complexity of interventions. Resistance to new interventions is often seen as a response to perceived threats to baseline status, amplified by mistrust and communication barriers (Sahay & Goldthwaite, 2024). Understanding resistance dynamics and utilizing empowerment strategies are crucial for navigating these challenges.

Future research should focus on developing high-quality evidence and robust evaluation designs to close the gaps between evidence and practice. There is a need for further qualitative research to address power dynamics and other influencing factors, especially in low and middle-income countries (Jude N. Ominyi & David A. Agom, 2020).

Monitoring and Evaluation of Evidence-Based Management: There is a high priority to establish approaches for monitoring evidence-based management in healthcare organizations. Future research should focus on developing and validating these monitoring approaches to ensure the effective implementation of evidence-based management practices.

Sustainment Strategies for Chronic Disease Prevention: The systematic review aims to identify effective strategies for sustaining evidence-based interventions (EBIs) targeting chronic disease prevention. Future research should explore the cost implications and potential unintended adverse effects of these sustainment strategies on end-users.

Long-term Sustainment in Tertiary Settings: The SITS framework highlights the need for further research on the determinants and knowledge translation interventions (KTIs) that influence the long-term sustainment of EBPs in tertiary settings. Future studies should investigate how changing conditions over time affect these determinants and the effectiveness of participatory approaches in designing remedial plans.

Implementation and Sustainability Toolkit

Evaluation: The Fuld Institute toolkit has undergone initial evaluations, but further research is needed to assess its long-term impact on the implementation and sustainability of EBPs in diverse healthcare settings. Future studies should also explore the toolkit's adaptability and effectiveness across different clinical environments.

Framework for Evidence-Based Management

The perspective framework for evidence-based management presented in the paper suggests the need for future research to refine and test the operational recommendations and guidelines in various healthcare contexts. This includes tailoring evidence-based management practices to specific organizational needs and evaluating their impact on healthcare outcomes.

Sustainability Practice Guide Development:

The findings from the systematic review on sustainment strategies will inform the development of a sustainability practice guide for public health practitioners. Future research should focus on validating this guide and assessing its practical application in real-world settings.

These directions highlight the ongoing need for research to refine, validate, and implement evidence-based practices and sustainment strategies across various healthcare settings.

7. CONCLUSION

The integration of nursing theory with implementation science is crucial for advancing EBPs and ensuring the sustainability of nurse-led initiatives in healthcare. By providing a structured framework for the systematic adoption of EBPs, nursing theories help overcome barriers and enhance the quality of care. However, addressing the challenges in implementation and sustainment requires ongoing education, strong leadership, and tailored strategies. Future research should continue to explore the intersection of nursing theory and implementation science to promote sustainable healthcare practices globally.

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