



Implementation Science and Implementation Research: A Move Forward in Improving Nursing Outcomes

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Abstract: In an increasingly complex and technologically advanced healthcare environment, integrating evidence-based practice and innovation is critical to improving patient outcomes. Implementation science and implementation research offer structured approaches to close the persistent gap between research evidence and routine clinical practice. This paper outlines the core concepts of implementation science and implementation research, explores their interrelationship, and reviews relevant methodological approaches. It also emphasizes the pivotal role of advanced practice nurses and policymakers in harnessing these disciplines to accelerate evidence translation and drive sustainable improvements in healthcare quality, nursing care quality, and patient outcomes.

Keywords: Advanced practice nurses, Implementation research, Implementation science, Nursing outcomes, Quality of nursing care

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Introduction

Delivering high-quality nursing care is essential for achieving optimal health outcomes across healthcare settings. Despite strong evidence and established best-practice guidelines, a persistent “know–do gap” prevents routine translation of research into practice.¹ This gap leads to suboptimal patient outcomes, inefficient use of resources, and higher healthcare costs. Closing the gap requires a systematic approach to identifying and overcoming barriers to evidence-based nursing practice.

Implementation Science

Implementation science is a field of study that encompasses the theory, methodology, and scientific

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frameworks used to understand how to move evidence, such as interventions, programs, or policies, into routine health care and public health settings.^{2,3} The goal is to develop generalizable knowledge, theories, and models that can be applied across many different settings. Essentially, implementation science seeks to close the “know–do” gap—the period between when a discovery is made in a controlled research setting and when it actually reaches the people who provide healthcare and those who need it to improve their health.

To understand implementation science, it is helpful to distinguish it from traditional clinical research, which focuses on what works (e.g., “Does the clinical practice guideline for the Respiratory Muscle Weakness Prevention Program among People with Ventilators work?”). Implementation Science, however, focuses on how to make it work in the real world (e.g., “How do we ensure every nurse in a critical care unit uses this Prevention Program?”).

Frameworks and Concepts of Implementation Science

Researchers in this field often use specific frameworks to evaluate success. The two popular frameworks are the RE-AIM^{4,5} and CFIR.⁶

The RE-AIM framework,^{4,5} comprises:

- **Reach:** How many people from the target population are affected?
- **Effectiveness:** Does the intervention actually work in a real-world setting?
- **Adoption:** Will staff or organizations agree to use the intervention?
- **Implementation:** Is the intervention being delivered as intended (fidelity)?
- **Maintenance:** Can the intervention be sustained over the long term?

The implementation is the “how-to” component that improves uptake. Examples include:⁵

- **Provider training:** Workshops or educational outreach.
- **Stakeholder engagement:** Involving community leaders or subject matter experts to refine the process.
- **Audit and feedback:** Monitoring performance and providing data back to the practitioners.
- **Pilot testing:** Running small-scale trials (e.g., with a group of 30 participants) to identify logistical barriers before a full rollout.

While RE-AIM is great for *evaluation*, the CFIR is better for *planning*. It helps identify barriers before you start by looking at:^{6,7}

- **Intervention characteristics:** Is the intervention easy to use?
- **Outer setting:** Are there government policies or patient needs driving this?
- **Inner setting:** Does the specific clinic have the culture and resources to support it?
- **Characteristics of individuals:** Do the practitioners believe in the tool, intervention, or practice guideline?
- **Process:** How will the rollout be planned and executed?

Implementation Research

Implementation research is the systematic study of methods and strategies used to bridge the “know-do gap”—the space between what we know works (based on scientific evidence) and what is actually done in real-world practice.⁸ Implementation research is the practical application of those scientific principles to a specific problem or intervention. It is the actual “doing” of the study—the collection and analysis of data within a specific context.⁸ The goal is to evaluate the success of a specific strategy in a specific setting (e.g., a city hospital or a rural school district). It focuses, for example, on “How well did the specific training program work for the 30 participants in this pilot study?”

Components of Implementation Research

To understand the field, it helps to distinguish between the “evidence-based practice, program, or policy, which want to put into place” and the “process” of implementation.

- **The Intervention** is the evidence-based practice, usually in the form of a clinical practice guideline, program, or policy, which needs to be put into practice.

- The Implementation Strategy is the specific methods used to help people adopt the intervention (e.g., training sessions, expert reviews, or pilot testing).

- Implementation Outcomes: How to measure success. Unlike clinical trials that look at health outcomes (like recovery rates), implementation outcomes look at:

Feasibility: Can it actually be done in this setting?

Fidelity: Is it being used exactly as intended?

Acceptability: Do the practitioners and users actually like it?

Sustainability: Will it continue to be used after the research ends?

Successful program implementation is shaped by multiple organizational and contextual factors. Key facilitators include leadership engagement, the presence of formally appointed internal implementation leaders, the program's compatibility with existing organizational processes, the availability of sufficient resources, and the involvement of external change agents. In addition, the presence of champions who actively advocate for the program, the perceived relative advantage of the intervention compared with current practices, and the engagement of key stakeholders play important roles in supporting effective implementation.⁸ Collectively, these elements contribute to creating an enabling environment that promotes the successful adoption and sustainability of implementation efforts.

Comparison of Implementation Science and Implementation Research

Implementation science has emerged as an important field aimed at promoting the systematic uptake of evidence-based interventions into routine practice to improve the quality and effectiveness of health services. Despite the growing availability of evidence-based guidelines and interventions, a persistent gap remains between research findings and their practical application in real-world settings. Implementation science seeks to address this gap by examining the methods, strategies, and contextual factors that influence the adoption, implementation, and sustainability of evidence-based practices. Closely related to this field is implementation research, which focuses on generating empirical evidence on how specific interventions can be effectively integrated within particular organizational or community contexts. While both fields share the common goal of improving the translation of evidence into practice, they differ in their scope, focus, and primary outputs. Implementation science tends to emphasize the development of theoretical frameworks, conceptual models, and generalizable knowledge, whereas implementation research focuses on the practical evaluation of implementation strategies in specific settings. To better illustrate these distinctions, the key characteristics of implementation science and implementation research are summarized in Table 1.

Table 1. Comparison of implementation science and implementation research⁴⁻⁶

Feature	Implementation science	Implementation research
Scope	Broad and theoretical	Specific and applied
Primary output	New frameworks, validated scales, and generalizable theories	Results of a specific intervention and site-specific barriers/facilitators
Key question	“Why do certain strategies work in principle?”	“Did this strategy work for this group?”
Relationship	The “Body of Knowledge”	The “Activity” that builds the body of knowledge

The relationship between implementation science and implementation research is cyclical. Researchers use implementation science to design a study. They then conduct implementation research to see if their ideas work in the real world. The findings from that research are then fed back into the field of implementation science to refine the theories for the next person.

Advanced Practice Nurse (APN) and Implementation Research

Ensuring that healthcare practice is grounded in evidence requires strong organizational commitment. Health administrators must develop and implement healthcare and nursing systems that encourage, inform, and set clear expectations for practitioners to integrate evidence into clinical practice. The International Council of Nurses emphasizes that advanced practice nurses (APNs) should assume leadership roles in improving the quality of care by promoting and applying evidence-based practice.⁹ For example, APNs can contribute to leadership initiatives by participating in the development of clinical practice guidelines based on the most current and best available evidence. They may also play a key role in supporting the implementation of these guidelines and monitoring outcomes during the evaluation phase. Achieving this requires active support from nurse administrators and nursing managers, who must create environments that enable APNs to practice to the full extent of their expertise and professional capabilities. In the future, guideline implementation research should focus more on strong, evidence-based studies to improve theoretical understanding and provide better data support. This can help reduce the gap between implementation science and the application of guidelines in practice.¹⁰

The Methodology of Implementation Research

The methodology used in implementation research is largely determined by the research questions being addressed. It encompasses a range of systematic approaches to understanding and enhancing the adoption of evidence-based practices in routine or real-world healthcare settings. Despite growing recognition of its importance, debate among nursing researchers continues over the most appropriate research designs for studies focused on implementing evidence-based practice. Some researchers continue to rely on traditional clinical research designs that prioritize strict experimental control and the use of control groups. However, implementation science primarily focuses on determining whether interventions that have already demonstrated effectiveness—often established through randomized controlled trials and supported by systematic reviews or meta-analyses—can be successfully integrated into everyday practice. In this context, evidence-based interventions or clinical practice guidelines are implemented and evaluated to assess their feasibility, adoption, and effectiveness within specific settings.

Various research designs can be applied in implementation research. One commonly used approach is the mixed-methods design, which integrates both qualitative and quantitative methods to provide a more comprehensive understanding of implementation processes and outcomes. Observational study designs, such as ethnography, case studies, and cross-sectional surveys, are also valuable for exploring contextual factors and identifying barriers that may influence implementation. Additionally, data collection at multiple time points—such as through interrupted time series designs, where observations are conducted before and after implementation—can help assess changes over time. These approaches are particularly useful during the exploration phase, as they assist

researchers in identifying the most effective and cost-efficient interventions and implementation strategies.

Conclusion

Implementation science and implementation research are critical directions of nursing research. They provide the evidence and insights to bridge the gap between research and practice, ensuring that innovative solutions reach and benefit populations efficiently and sustainably. Advanced practice nurses are the key to achieving this goal.

Declaration on using AI: We used AI for improve English clarity and help in literature review.

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ศาสตร์การนำไปใช้และการวิจัยการนำไปใช้ : ก้าวไปข้างหน้าเพื่อยกระดับคุณภาพการพยาบาล

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บทคัดย่อ: ในบริบทของระบบสุขภาพที่มีการเปลี่ยนแปลงอย่างรวดเร็วและความก้าวหน้าทางเทคโนโลยี การปฏิบัติบนพื้นฐานของหลักฐานเชิงประจักษ์และนวัตกรรมมีความสำคัญอย่างยิ่งต่อการพัฒนาผลลัพธ์ด้านสุขภาพของผู้ป่วย ศาสตร์การนำไปใช้ (implementation science) และการวิจัยการนำไปใช้ (implementation research) เป็นกรอบแนวคิดเชิงระบบที่ช่วยเชื่อมโยงว่างระหว่างองค์ความรู้จากงานวิจัยกับการปฏิบัติการพยาบาลในชีวิตจริง บทความนี้นำเสนอแนวคิดพื้นฐานของ implementation science และ implementation research อธิบายความสัมพันธ์ระหว่างสองแนวคิดดังกล่าว รวมทั้งอภิปรายระเบียบวิธีวิจัยที่เกี่ยวข้อง นอกจากนี้ยังเน้นบทบาทสำคัญของพยาบาลผู้ปฏิบัติการชั้นสูงและผู้กำหนดนโยบายในการนำแนวคิดเหล่านี้ไปใช้เพื่อแปลงองค์ความรู้สู่การปฏิบัติและยกระดับความเป็นเลิศของระบบสุขภาพ

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