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The essentials of nursing innovation across global health ecosystems: An evolutionary concept analysis

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ABSTRACT

Background: The concept of nursing innovation remains inconsistently defined across the literature. This conceptual ambiguity impedes the advancement of nursing innovation scholarship.
Purpose: To advance conceptual clarity of nursing innovation within global health ecosystems as a heuristic to support the knowledge base of the nursing discipline.
Methods: The Innovation in NurSIng for Global Health ecosystems Transformation (INSIGHT) study applies Rodgers' evolutionary concept analysis. The search was performed in February 2025 across five databases, supplemented by hand-searching of reference lists. Rodger's core components (attributes, antecedents, consequences, surrogate terms, and related concepts) were identified and analyzed using a hybrid deductive–inductive thematic analysis. The synthesized findings were subsequently interpreted through a nursing philosophical lens. A conceptual model was developed and illustrated through an exemplar of nursing innovation.
Discussion: A total of 10,540 records were screened, with 43 articles included. Four defining attributes were identified: innovation characteristics, innovator capabilities, innovation process, and solution dimensions. Antecedents comprised contextual conditions (unmet needs, opportunity identification, and emerging demands) and structural conditions (innovation education, professional capabilities, leadership support, and organizational systems). Consequences included value generation and delivery, as well as unintended consequences. The analysis yielded a proposed definition of nursing innovation.
Conclusion: As nursing and health systems face unprecedented challenges, a shared understanding of nursing innovation among nursing stakeholders is essential to support the design and implementation of solutions that advance the well-being of individuals, populations, and global health ecosystems. Continued

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theoretical and empirical inquiry is warranted to further refine this evolving concept and advance nursing innovation scholarship.

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Introduction

Global healthcare systems are under increasing strain as shifting disease patterns, fiscal constraints, demographic and epidemiological transitions, and rapid technological change place growing pressure on health systems worldwide (Atun & Moore, 2021). These pressures have prompted a reconceptualization of healthcare as a health ecosystem that comprises a dynamic network of interconnected actors, including people receiving care, healthcare professionals, government agencies, insurers, and industry partners. Such ecosystems are characterized by coevolution, interdependence, iteration, and distributed value creation (Laihonen, 2012; Palumbo et al., 2017). Within this complexity, innovation has emerged as a critical imperative for addressing contemporary healthcare challenges and enhancing system performance (Atun & Moore, 2021; O'Hara et al., 2022; Udod, 2023; World Health Organization, 2023; Gasparino et al., 2024). The World Health Organization (WHO) has further emphasized innovation as central to strengthening the efficiency, effectiveness, and resilience of health systems (World Health Organization, 2023), relying on healthcare providers to lead innovation from within.

As the largest healthcare profession, nurses are strategically positioned at the center of care delivery, bridging human needs with organizational and system-level responses across the care continuum (World Health Organization, 2020; World Health Organization, 2025). Within the health sciences, nursing has been characterized by an orientation toward care that integrates biological, experiential, and contextual dimensions of health (Meleis, 2010), with practice enacted through sustained patient engagement and coordination across care settings (Institute of Medicine, 2011; Fawcett, 2017). This position affords nurses unique perspectives for identifying unmet needs, predicting health outcomes, recognizing system failures, and translating knowledge into actionable interventions (Benner et al., 2009; Fawcett, 2017; Institute of Medicine, 2011; Plsek & Greenhalgh, 2001). As such, innovation aligns with the foundations of the nursing profession and is an essential professional characteristic (Cao et al., 2023). Despite this acknowledged alignment between nursing and innovation (International Council of Nurses, 2009), nursing scholarship has been slow to develop foundational theoretical work on nursing innovation.

Contemporary definitions of nursing advanced by the International Council of Nurses (ICN) identify innovation as a component of the nursing professional scope of practice, alongside leadership, education, policy, advocacy, and research (International Council of Nurses, 2025). While these latter domains are supported by robust and extensive theory and research, nursing innovation remains inconsistently defined and conceptually underdeveloped. Although debate persists regarding whether innovation falls within nursing's formal mandate, nurses have long contributed to innovation in practice; contributions that have historically been overlooked and undervalued (International Council of Nurses, 2009). For this study, we adopted the working definition of nursing innovation as "the process of developing new approaches, technologies, and ways of working" (International Council of Nurses, 2009). Notably, although preliminary definitions of nursing innovation have been synthesized (Kaya et al., 2015), further conceptual development is required to strengthen the nursing disciplinary knowledge base and to clarify distinctions between nursing innovation and innovation in other health disciplines.

The urgency of this gap is amplified by increasing challenges facing the nursing profession, including rising mental health concerns, unsafe work environments, and ineffective leadership, all of which constrain nurses' ability to practice effectively (World Health Organization, 2025). These unmet needs simultaneously create conditions that necessitate innovation within the profession. Yet, nursing innovation is frequently discussed using variable and overlapping terminology—often conflated with creativity, technology, quality improvement initiatives, or entrepreneurship (Tross & Cavanagh, 1996; Feldman et al., 2008; Fuller & Hansen, 2019; Ferraz et al., 2021) that lacks a shared conceptual foundation. Such inconsistencies generate conceptual ambiguity, limit theoretical development, and hinder the advancement of nursing innovation scholarship. Establishing a clear and robust conceptual underpinning of nursing innovation is imperative to support shared understanding among the nursing workforce, health system decision-makers, and researchers. Clear conceptualization can inform theoretical and empirical development to enact nursing's contribution to health system transformation. In response to this critical gap, this study aims to advance conceptual clarity of nursing innovation within global health ecosystems as a heuristic to support the knowledge base of the nursing discipline.

Background

Innovation theory has evolved substantially over the past decades and across multiple disciplines, including economics, business, and the social sciences. Early economic theories introduced innovation as a process of "creative destruction" through which new ideas and practices disrupt existing economic structures and give rise to new ones (Schumpeter, 1911). During the mid-twentieth century, innovation scholarship expanded with the emergence of the linear model of innovation. This model framed innovation as a sequential process, progressing from basic research to applied development and ultimately to diffusion within markets and society (Godin, 2006). While influential, this perspective was later critiqued for oversimplifying the complex and interactive nature of innovation processes. A more socially grounded understanding was advanced by Rogers (1962) through the Diffusion of Innovations Theory. Rogers emphasized the role of communication channels, time, and social systems in shaping how innovations are adopted and spread. Subsequent developments in innovation theory further emphasized systemic change and market dynamics, aligning with Disruptive Innovation Theory. Christensen (2011) introduced the concept of disruptive innovation to describe how simpler, more affordable, and more accessible solutions can enter underserved markets and, through iterative improvement, challenge established incumbents. In contemporary contexts, such dynamics are increasingly visible in the rapid expansion of digital and artificial intelligence (AI) technologies.

As systems and societies have grown more interdependent and nonlinear, innovation theory has expanded beyond linear or market-oriented views to become more of an emergent property of interactions within systems. In healthcare, contemporary assumptions recognize that innovation emerges from nonlinear dynamics within adaptive systems thinking rather than from isolated advances (Atun & Moore, 2021). Therefore, the Complex Adaptive Systems (CAS) Theory provides the theoretical groundwork for this concept

Table 1
Inclusion and Exclusion Criteria for Literature Selection

Criteria	Include	Exclude
Population	Nursing professionals (e.g., registered nurses, licensed practical nurses).	Nursing professionals working in nonhealthcare organizational settings (e.g., nursing educators).
Topic	1) Literature defining nursing innovation by conveying the meaning explicitly or implicitly as a concept, construct, phenomenon, and/or outcome of interest; and/or 2) Literature measuring nursing innovation as a means of operationalizing the concept. **We accepted all definitions of nursing innovation and included literature providing substantive contributions to the concept through explicit examination of at least three core conceptual elements (attributes, antecedents, and consequences).*	1) Literature in which the term "innovation" was applied as an adjective to qualify innovative interventions, strategies, models, and practices, among others, without articulated criteria to substantiate their innovative nature; and/or 2) Related but distinct concepts or constructs (e.g., innovative behavior, culture of innovation, evidence-based innovation, practice-based innovation, and innovation-project spread).
Context	Conducted across global health ecosystems, including healthcare systems and/or delivery organizations (e.g., hospitals, clinics, primary healthcare, and home care) as the context.	Focused on research or nursing education contexts.
Design / Publication type	Peer-reviewed research, literature reviews, and/or discussion/theoretical papers.	Gray literature (e.g., editorials, proceedings, magazines, news, books, book chapters, handbooks, interviews, commentaries, expert opinions, thesis/dissertations, and protocols). **While we recognize the value of gray literature, it was excluded as it may reflect speculative or pragmatic uses of the concept that are insufficiently theorized and may dilute analytic coherence.*

analysis. Complex adaptive systems are defined as "a collection of individual agents with freedom to act in ways that are not always predictable and whose actions are interconnected" (Holden, 2005). These systems continuously adapt to their environment and, through this adaptation, learn and evolve (Holden, 2005; Notarnicola et al., 2017). Complex adaptive systems often exhibit system archetypes: recurring patterns of system behavior that help identify underlying structural problems, understand persistent challenges, anticipate unintended consequences, and avoid solutions that inadvertently worsen conditions. These archetypes enable deeper examination of why particular patterns recur and why certain problems resist traditional interventions (Senge, 1990, pp. 93–95).

These assumptions are extended and deepened with ecosystem thinking. While systems thinking often analyzes bounded systems (such as organizations or clinical pathways), ecosystem thinking recognizes that real-world health challenges emerge within open, porous, and coevolving environments. These environments involve distributed agency, shifting roles, and multisector collaboration across health, social services, education, public health, technology, and environmental systems. Ecosystems also emphasize value exchange, incentive alignment, resilience through diversity, and the role of external forces—including climate and economic conditions—in shaping health and care (Holden, 2005; Laihonen, 2012; Notarnicola et al., 2017; Palumbo et al., 2017).

Health ecosystems exemplify complex adaptive systems comprising numerous interconnected organizations and agents (people receiving care, clinicians, administrators, and policymakers) who interact, respond to pressures, and coevolve over time to meet the evolving health needs (Atun & Moore, 2021; Holden, 2005; Laihonen, 2012; Notarnicola et al., 2017; Palumbo et al., 2017). Nursing itself also exhibits the characteristics of a complex adaptive system (Holden, 2005; Notarnicola et al., 2017), identifying and influencing system archetypes (patterns) that require transformation. White and Begun (1996) were among the earliest scholars to position nursing within a complex adaptive systems paradigm, arguing that nurses' boundary-spanning practice uniquely positions them at the forefront of innovation and enables insights into the design of care processes, models, and environments. Framing nursing as a complex adaptive system situates the profession at the forefront of innovation (White & Begun, 1996), as nurses must remain responsive to evolving health needs and the system dynamics that shape practice.

Methods

Study Design

The *I*nnovation in *N*ur*SI*ng for *G*lobal *H*ealth ecosystems *T*ransformation (INSIGHT) study followed Rodgers and Knafl's (2000) evolutionary concept analysis method. Grounded in dispositional theory, this approach conceptualizes phenomena as dynamic, inductively derived, and continuously shaped by temporal and contextual influences. This method was selected because it is particularly well-suited to examining concepts that lack fixed boundaries and evolve across disciplines and over time (Rodgers & Knafl, 2000). Given that nursing innovation is variably conceptualized in the literature, the evolutionary approach provides an appropriate methodological guideline for examining its conceptual components and delineating the concept's boundaries. Data were reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Page et al., 2021) guidelines.

Eligibility Criteria

The literature selection process was informed by the detailed inclusion and exclusion criteria outlined in Table 1.

Literature written in English, Portuguese, and Spanish was considered for inclusion, as the authors have linguistic proficiency in these languages. No timeframe was specified to allow a comprehensive examination of the concept over time.

Data Sources and Search Strategy

A comprehensive literature search was conducted in February 2025 across five electronic databases: Ovid MEDLINE, CINAHL, Web of Science (All Databases), Scopus, and Business Source Complete. The search strategy was developed with the support of an experienced health sciences librarian and incorporated both natural language keywords and controlled vocabularies, including subject headings where appropriate (*nurses*, *nursing*, *diffusion of innovation*, *delivery of health care*, and *health services*). Additionally, focused hand-searching was conducted of the reference lists of articles included in the final sample to identify additional eligible literature.

Screening

All records identified were manually and independently screened by two reviewers (LG, AACA) using Covidence, based on predetermined inclusion and exclusion criteria. Consensus meetings were held to resolve discrepancies during the title/abstract and full-text screening stages, with a third research team member (GGC) consulted to make the final decision when disagreements remained. For records without available full texts, library assistance was requested, and corresponding authors were contacted. Records were excluded when full texts could not be retrieved, and author correspondence yielded no response.

Data Extraction and Analysis

Data extraction was conducted by one research team member and validated by another, capturing the following elements: (a) Article characteristics: author(s), year of publication, and country; (b) Theoretical framework; (c) Article type: research study, literature review, or discussion/theoretical paper; (d) Method (when applicable): design/publication type and sample; and (e) Components of Rodgers' evolutionary method (*antecedents*, *attributes*, *consequences*, *surrogate terms,* and *related concepts*) (Rodgers & Knafl, 2000). See Table 2 for the description of the components of Rodgers' evolutionary method.

Data extraction was guided by predefined analytical categories (*antecedents*, *attributes*, *consequences*, *surrogate terms,* and *related concepts*), reflecting a deductive analytic structure. Within each category, open coding was conducted inductively, allowing patterns of meaning to be generated from the data. Although predefined categories provided an initial analytic framework, they were used as sensitizing concepts rather than fixed boundaries; coding remained open and iterative, and data that did not readily align with these categories were examined to refine or expand the analytic framework. Data analysis followed Braun and Clarke's (2006) six phases of thematic analysis: (1) familiarization with the data, (2) generation of initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report. Initial coding and theme development were undertaken by one member of the research team and subsequently discussed with a second team member to support analytic refinement. Frequency counts were used only to organize and group codes within themes and were not used to generate themes. Themes were further refined through iterative discussion within the research team.

The findings were aggregated and visually represented in a conceptual model integrating key elements of nursing innovation within global health ecosystems, including antecedents, attributes, and consequences. In keeping with Rodgers and Knafl (2000), an exemplar derived from the themed data was also presented to illustrate the concept in practice. Additionally, the synthesized findings were examined through the philosophical lenses of nursing ontology (Fawcett, 2017) and epistemology (Risjord, 2010) to clarify the underlying assumptions that distinguish nursing innovation as a disciplinary concept. This interpretive extension enabled the development of a definition that integrates both the conceptual meaning and operational enactment of nursing innovation within the philosophical foundations of nursing as a discipline. Following extensive deliberation, a synthesized definition of nursing innovation was proposed.

Building on this synthesized conceptualization, we examined nursing innovation in relation to contextually adjacent innovation constructs within the nursing discipline (e.g., innovative behavior) and to innovation concepts emerging from the broader healthcare field (e.g., healthcare innovation). Recognizing that concepts are contextually situated (Rodgers & Knafl, 2000), this comparative analysis was conducted to enhance cross-disciplinary understanding and identify characteristics that define the boundaries of the concept within the nursing discipline. We also examined the evolution of nursing innovation over time to examine and contextualize its development and application.

Table 2
Components of Rodgers' Evolutionary Method (Rodgers & Knafl, 2000)

Components	Definition
Attributes	Defining characteristics that distinguish the concept's usage.
Antecedents	Events, conditions, situations, or factors that precede the expression of the concept.
Consequences	Outcomes or effects resulting from the occurrence or application of the concept.
Surrogate terms	Synonyms, alternative terms, or phrases used to refer to the concept in various contexts.
Related concepts	Concepts sharing similarities in nature, but lacking the full set of attributes of the concept of interest.

Results

Characteristics of the Included Articles

For the database searching, 15,150 records were identified. Following the removal of duplicates, 10,513 titles and abstracts were screened, of which 354 records were retrieved for full-text review. After applying the predefined inclusion and exclusion criteria, 42 articles were included in the analysis. For the hand-searching, 26 records were identified and assessed at the full-text level, resulting in the inclusion of one additional article. The final sample comprised 43 articles (42 from databases and one from hand-searching). See Figure 1 for a detailed PRISMA of the study selection process.

Articles included were published between 1993 and 2023 from the United States of America (USA; n = 30), Taiwan (n = 4), the United Kingdom (n = 3), Australia (n = 1), China (n = 1), New Zealand (n = 1), Portugal (n = 1), and Turkey (n = 1). One article did not report the country of origin. Article types included discussion/theoretical papers (n = 25), empirical research studies (n = 14), and literature reviews (n = 4). Articles that reported on the theoretical framework were grounded in the Diffusion of Innovations Theory (n = 2) and the Jobs-to-be-Done Theory (n = 2). All other articles did not report a theoretical framework or reported it only once. See Table 3 for all characteristics of included articles.

Components of Rodgers' Evolutionary Method

The components of Rodgers' evolutionary method (*attributes, antecedents*, *consequences*, *surrogate terms*, and *related concepts*) were thematically grouped to capture recurring patterns of meaning within each component. A comprehensive summary of these components is presented in Table 3. In-text citation number for each component refers to the study numbers listed in Table 3.

Attributes of Nursing Innovation

The *attributes* of nursing innovation were described in four main themes: (a) *innovation characteristics*; (b) *innovator capabilities*; (c) *innovation process*; and (d) *solution dimensions*.

Fundamentally, nursing innovation is *multidimensional* (8, 10, 30), characterized by *adaptation* (4, 16, 38, 43) and a *context-dependent* (4) nature, reflecting the complex interdependencies that operate within adaptive health ecosystems. Among the included articles, *perceived novelty* relative to the relevant unit of adoption (1–7, 9–15, 17, 20–24, 26, 28, 30, 32, 33, 36, 38, 39, 41, 43) emerged as a defining characteristic of nursing innovation. This perceived novelty may vary in its *degree of innovativeness* (10, 13, 14, 26, 33) and may manifest as either the invention of something new (1–5, 11, 30, 33, 38) or the reinvention of something that already exists (4, 5, 10, 11, 18, 22). Regardless of whether innovation takes the form of invention or reinvention, the *magnitude of change* may vary along a continuum

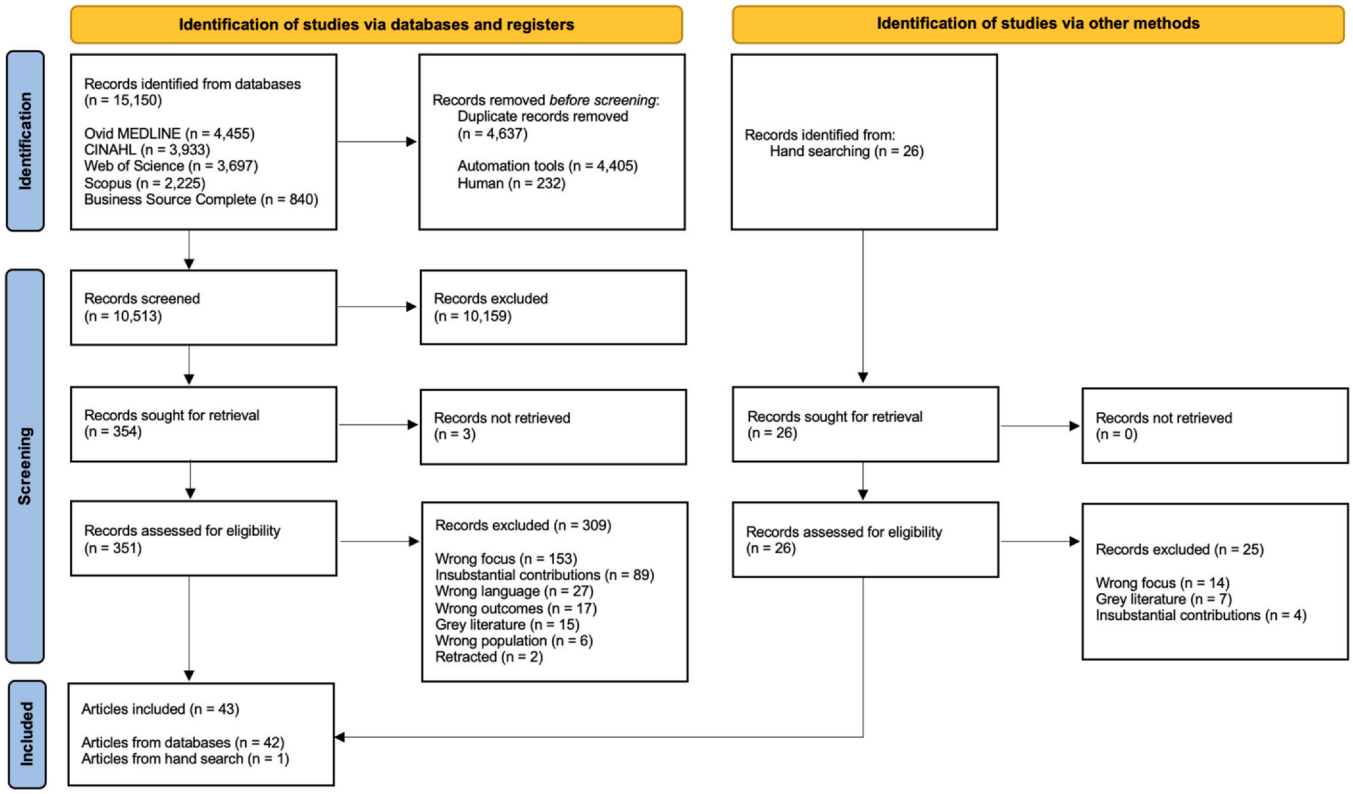


Figure 1. PRISMA (Page et al., 2021).

from *incremental* (1, 3–7, 9–11, 15, 18, 21, 22, 30, 33, 36–38, 43) to *disruptive* (1, 7, 10, 21, 23, 30, 39). These differences in the degree of change also determine the *pace dynamics* of innovation, which may unfold through *reform-oriented* (6, 11, 38) or more *rapid-cycle* processes (23, 28).

Attributes of nursing innovation are also expressed by the individual characteristics of the nursing innovator. Innovator capabilities are conveyed through *innovation competencies* (acquired knowledge, skills, and abilities) (3, 4, 6–10, 12, 15, 21–24, 26–28, 31, 33, 34, 36–39, 41–43) and the *innovation mindset* (3, 13, 14, 43) that are expressed through actionable *innovation behavior* (1, 6, 8, 10, 14, 22, 23, 32–37, 41, 43). Articles in the sample identified creativity (4, 14, 28, 30, 31), tenacity (11, 18, 21, 26, 30, 38), and self-confidence (11, 18, 21, 23, 26, 30, 39) as important nursing innovator traits (innate qualities)—all other traits were reported in less than five articles. A cross-sectional study included in the sample suggests that nurses' intrinsic personal traits are the primary drivers of innovation (33). Risk-taking (18, 19, 23, 26, 27, 30, 39) was the most reported competency, while change agent (5, 8, 17, 23, 31, 32, 43) was the most reported behavior—all other competencies and behaviors were reported less than seven times.

The *innovation process* also constitutes an attribute of nursing innovation. It is understood as a *multistage*, *iterative* process that enables nursing innovators to systematically design new solutions or existing ones (10, 20, 29, 36, 41). The design involves *empathizing with unmet needs* (4, 18, 42), *defining problems* (14, 18, 24, 32), *generating ideas* (3, 5–7, 10, 14, 15, 17, 21, 26, 27, 33, 35, 36, 39, 41–43), and *creating knowledge* (8, 16, 31, 35–38, 42) by *prototyping* (1, 4, 17, 42) and *testing* (18, 42) potential solutions. Importantly, innovation extends beyond design to include *implementation* (2, 3, 6, 11, 14–17, 20, 21, 25, 36, 39, 43), particularly in relation to diffusion across relevant units of adoption (8, 10, 35–37). The process further incorporates ongoing *evaluation and outcome measurement* to assess effectiveness and to anticipate and manage associated risks (17, 20, 26, 31, 35), supporting *innovation sustainability* over time (26, 28, 30). Within nursing innovation, design principles such as the human-centered design (HCD) serve as a guiding philosophy (3, 6, 7, 15, 17, 19, 33, 42, 43), ensuring that solutions remain grounded in the needs, experiences, and values of those affected. Design Thinking is frequently operationalized as the methodological approach underpinning this process (4, 15, 17, 18, 30).

As the outcome of the innovation process, the *solution* was also shown to be a critical attribute. Solutions can be *tangible* (concrete, observable, and/or measurable), *intangible* (nonphysical, abstract, and/or immeasurable), or *hybrid* (combining tangible and intangible elements). The most reported tangible solutions were products (2, 3, 5, 6, 7, 9, 10–12, 15, 20, 24, 26, 30, 31, 33, 35–37, 39), technology (2, 5, 6, 8, 10, 15, 16, 18, 21, 22, 26, 28, 31, 32, 36, 43), tools (3, 5, 7, 16, 22, 25, 43), methods (1, 4, 5, 8, 11, 15, 16, 41), or devices (1, 3, 5, 6, 12, 16, 21, 25). Intangible solutions reported were processes (2, 4–8, 10, 12–14, 16, 18, 22–26, 28–33, 35–41, 43), ideas (1, 2, 4–12, 14–16, 18, 20, 22, 24, 25, 27, 28, 30, 31, 33–35, 38, 40, 41), ways of thinking (3, 5, 10, 14, 15, 17, 25, 26, 28, 33, 35, 40, 41), practices (2, 3, 6, 11, 18, 24, 26, 28, 30, 40, 43), and approaches (1, 3, 6, 7, 18, 21, 22, 24, 29, 40). Hybrid solutions included services (3, 5–7, 10, 11, 15, 25–27, 31, 33, 35–37) as the major reported. All other tangible, intangible, and hybrid solutions were reported less than six times. To be an innovation, the solutions must be *desirable* (1, 22, 4, 5, 8, 10–13, 20, 24, 29, 33, 35–37, 39, 41, 42), *viable* (1, 10, 11, 20, 22, 24, 29, 32, 34, 42), and *feasible* (1, 22, 29, 39, 42).

Antecedents of Nursing Innovation

The antecedents of nursing innovation identified were grouped into two main categories, including: (a) *contextual conditions* (*unmet needs*, *opportunity identification*, and *emerging demands*); and (b) *structural conditions* (*innovation education*, *professional capabilities*, *leadership support*, and *organizational systems*).

Table 3
Characteristics of Included Articles and Components of Rodgers' Evolutionary Method

Ref.	Author, Year of Publication, and Country	Theoretical Framework	Study Type/ Design	Sample (RR)	Rodgers' Components				
					Attributes	**Antecedents**	**Consequences**	**Surrogate Terms**	**Related Concepts**
1	Albert, 2018 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty - Degree of Change *Innovator Capabilities* - Traits *Innovation Process* - Knowledge Creation (Prototyping) *Solution Dimensions* - Tangible - Intangible - Mixed - Qualifiers: Desirable, Viable, and Feasible	*Contextual Conditions* - Unmet Needs *Structural Conditions* - Innovation Education - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Professional - Systemic - Social *Unintended Consequences* - Failure	Innovation Leadership	Change Management Continuous Improvement Leadership
2	Babington, 1993 United States of America (USA)	Diffusion of Innovation Theory	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty *Innovation Process* - Implementation *Solution Dimensions* - Tangible - Intangible	*Contextual Conditions* - Unmet Needs - Opportunities Identification *Structural Conditions* - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Systemic	NR	Total Quality Management
3	Beaudet et al., 2023 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty - Degree of Change *Innovator Capabilities* - Traits *Innovation Process* - Idea Generation - Implementation *Solution Dimensions* - Tangible - Intangible - Mixed	*Contextual Conditions* - Unmet Needs - Emerging Demands *Structural Conditions* - Innovation Education - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Professional - Systemic - Social	Innovation Mindset Innovation Leadership Culture of Innovation Open Innovation	Change Management Human-Centered Design (HCD)
4	Blakeney et al., 2009 United States of America (USA)	User-driven Innovation Model	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty - Degree of Change *Innovator Capabilities* - Traits - Behavior *Innovation Process* - Empathizing with Unmet Needs - Knowledge Creation (Prototyping) *Solution Dimensions* - Tangible - Intangible - Qualifier: Desirable	*Contextual Conditions* - Unmet Needs *Structural Conditions* - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical *Solution Dimensions* - Tangible - Intangible - Qualifier: Beneficial	Innovation Leadership Open Innovation	Design Thinking Technology (Electronic Health Records/ Virtual Simulation)
5	Collins & McClellan, 2023 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Nature - Perceived Novelty *Innovator Capabilities* - Behavior *Innovation Process* - Idea Generation *Solution Dimensions* - Tangible - Intangible - Mixed - Qualifier: Desirable	*Contextual Conditions* - Unmet Needs *Structural Conditions* - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Professional - Systemic	Culture of Innovation Open Innovation	Innovation Protection (Patents)
6	Davis & Marshall, 2014 United States of America (USA)	Branch Innovation Model	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty - Degree of Change - Pace of Change *Innovator Capabilities* - Traits - Mindset *Innovation Process* - Idea Generation - Implementation *Solution Dimensions* - Tangible - Intangible - Mixed	*Contextual Conditions* - Unmet Needs *Structural Conditions* - Innovation Education - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Systemic - Social	Innovation Management Culture of Innovation	Design

(*continued on next page*)

Table 3 (*continued*)

Ref.	Author, Year of Publication, and Country	Theoretical Framework	Study Type/ Design	Sample (RR)	Rodgers' Components				
					Attributes	**Antecedents**	**Consequences**	**Surrogate Terms**	**Related Concepts**
7	Demiris et al., 2020 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty - Degree of Change *Innovator Capabilities* - Traits - Competencies *Innovation Process* - Idea Generation *Solution Dimensions* - Tangible - Intangible - Mixed	*Contextual Conditions* - Unmet Needs *Structural Conditions* - Innovation Education - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Experiential - Systemic	Organizational Innovation	Change Management Continuous Improvement Technology (Data Science) Design
8	Ferraz et al., 2021 Portugal	NR	Research/cross-sectional study	n = 667 nurses (RR NR)	*Innovation Characteristics* - Nature *Innovator Capabilities* - Traits - Behaviour *Innovation Process* - Knowledge Creation - Diffusion *Solution Dimensions* - Tangible - Intangible - Qualifier: Desirable	*Contextual Conditions* - Unmet Needs - Emerging Demands *Structural Conditions* - Innovation Education - Innovator Capability - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Professional - Systemic - Social *Unintended Consequences* - Learning from Failure *Solution Dimensions* - Tangible - Intangible	Organizational Innovation	Entrepreneurship Intrapreneurship
9	Fuller & Hansen, 2019 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Nature - Perceived Novelty - Degree of Change *Innovator Capabilities* - Traits *Solution Dimensions* - Tangible - Intangible	*Contextual Conditions* - Unmet Needs *Structural Conditions* - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Professional - Systemic - Social *Solution Dimensions* - Intangible - Qualifier: Beneficial	Innovation Mindset	Technology (Artificial Intelligence/ Electronic Health Records/Big Data /Virtual Reality) Venture Capital Business Models
10	Gilmartin, 1998 United States of America (USA)	NR	Literature review/ concept analysis	n = 58 records	*Innovation Characteristics* - Nature - Perceived Novelty - Degree of Change *Innovator Capabilities* - Traits *Innovation Process* - Idea Generation - Diffusion - Qualifier: Systematic *Solution Dimensions* - Tangible - Intangible - Mixed - Qualifiers: Desirable and Viable	*Contextual Conditions* - Unmet Needs - Opportunities Identification - Emerging Demands *Structural Conditions* - Innovation Education - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Professional - Systemic - Social *Solution Dimensions* - Tangible - Mixed - Qualifier: Beneficial	Managerial Innovation Organizational Innovation Culture of Innovation	Leadership Change Management Entrepreneurship
11	Hughes, 2006 New Zealand	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty - Degree of Change - Pace of Change *Innovator Capabilities* - Traits - Competencies - Mindset - Behaviour *Innovation Process* - Implementation *Solution Dimensions* - Tangible - Intangible - Mixed - Qualifiers: Desirable and Viable	*Contextual Conditions* - Unmet Needs - Opportunities Identification *Structural Conditions* - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Systemic - Social	NR	Leadership Technology

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Ref.	Author, Year of Publication, and Country	Theoretical Framework	Study Type/ Design	Sample (RR)	Rodgers' Components				
					Attributes	**Antecedents**	**Consequences**	**Surrogate Terms**	**Related Concepts**
12	Iuppa, 2022 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty *Innovator Capabilities* - Traits *Solution Dimensions* - Tangible - Intangible - Mixed - Qualifier: Desirable	*Contextual Conditions* - Emerging Demands *Structural Conditions* - Innovation Education - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Systemic *Solution Dimensions* - Tangible - Qualifier: Beneficial	NR	Technology Innovation Protection
13	Joseph et al., 2019a United States of America (USA)	Jobs to Be Done Theory	Research/ qualitative	n = 57 nurses	*Innovation Characteristics* - Perceived Novelty *Innovator Capabilities* - Traits *Solution Dimensions* - Intangible	*Contextual Conditions* - Unmet Needs - Opportunities Identification - Emerging Demands *Structural Conditions* - Innovation Education - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Professional - Systemic - Social *Solution Dimensions* - Qualifier: Beneficial	Innovation Mindset	NR
14	Joseph et al., 2019b United States of America (USA)	Jobs to Be Done Theory	Research/ qualitative	n = 57 nurses	*Innovation Characteristics* - Perceived Novelty *Innovator Capabilities* - Traits *Innovation Process* - Problem Definition - Idea Generation - Implementation *Solution Dimensions* - Intangible	*Contextual Conditions* - Unmet Needs - Opportunities Identification *Structural Conditions* - Innovation Education - Innovator Capability	*Value Generation & Delivery* - Clinical - Experiential - Professional - Systemic - Social *Solution Dimensions* - Tangible - Intangible - Mixed	Innovation Behaviour Innovation Mindset Culture of Innovation	NR
15	Kagan et al., 2021 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty *Innovator Capabilities* - Traits *Innovation Process* - Idea Generation - Implementation *Solution Dimensions* - Tangible - Intangible - Mixed	*Contextual Conditions* - Unmet Needs - Opportunities Identification *Structural Conditions* - Innovation Education - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Systemic - Social	Innovation Mindset Open Innovation	Quality Improvement Design Thinking Human-Centered Design (HCD) Entrepreneurship Innovation Protection (Intellectual Property/ Patents)
16	Kaya et al., 2015 Turkey	NR	Literature review	NA	*Innovation Characteristics* - Perceived Novelty - Degree of Change *Innovation Process* - Knowledge Creation - Implementation *Solution Dimensions* - Tangible - Intangible	*Contextual Conditions* - Unmet Needs - Opportunities Identification - Emerging Demands *Structural Conditions* - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Systemic - Social *Solution Dimensions* - Tangible - Intangible - Mixed - Qualifier: Beneficial	NR	NR
17	Koppel & Sullivan, 2022 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty *Innovator Capabilities* - Behaviour *Innovation Process* - Idea Generation - Knowledge Creation (Prototyping) - Implementation - Outcome Measurement *Solution Dimensions* - Intangible	*Contextual Conditions* - Unmet Needs *Structural Conditions* - Innovator Capability - Leadership Support	*Value Generation & Delivery* - Clinical - Experiential - Professional - Systemic *Solution Dimensions* - Tangible - Qualifier: Beneficial	NR	Change Management Technology (Artificial Intelligence/ Telehealth/ Virtual Reality) Design Thinking Human-Centered Design (HCD)

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Ref.	Author, Year of Publication, and Country	Theoretical Framework	Study Type/ Design	Sample (RR)	Rodgers' Components				
					Attributes	**Antecedents**	**Consequences**	**Surrogate Terms**	**Related Concepts**
18	Koszalinski et al., 2021 United States of America (USA)	NR	Research/ observational study	n = 13 registered nurses (RR NR)	*Innovation Characteristics* - Perceived Novelty - Degree of Change *Innovator Capabilities* - Traits - Competencies *Innovation Process* - Empathizing with Unmet Needs - Problem Definition - Knowledge Creation (Testing) *Solution Dimensions* - Tangible - Intangible	*Contextual Conditions* - Unmet Needs - Opportunities Identification - Emerging Demands *Structural Conditions* - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Systemic - Social *Solution Dimensions* - Qualifier: Beneficial	Open Innovation (Hackathon)	Design Thinking
19	Machon et al., 2019 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovator Capabilities* - Traits - Competencies - Mindset - Behaviour	*Contextual Conditions* - Unmet Needs *Structural Conditions* - Innovation Education - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Social	Innovation Leadership Culture of Innovation	Human-Centered Design (HCD)
20	Manion, 1993 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty - Degree of Change *Innovator Capabilities* - Competencies - Behaviour *Innovation Process* - Implementation - Outcome Measurement - Qualifier: Systematic *Solution Dimensions* - Tangible - Intangible - Qualifiers: Desirable and Viable	*Contextual Conditions* - Unmet Needs - Emerging Demands *Structural Conditions* - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Systemic *Unintended Consequences* - Learning from Failure	Innovation Management	Leadership
21	Noles et al., 2019 United States of America (USA)	NR	Research/ concurrent mixed-methods	n = 44 nurses (RR NR)	*Innovation Characteristics* - Perceived Novelty - Degree of Change *Innovator Capabilities* - Traits *Innovation Process* - Idea Generation - Implementation *Solution Dimensions* - Tangible - Intangible - Mixed	*Contextual Conditions* - Unmet Needs - Emerging Demands *Structural Conditions* - Innovation Education - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Systemic - Social *Unintended Consequences* - Failure	Diffusion of Innovation	NR
22	Nursing, 2009 NR	Diffusion of Innovation Theory	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty *Innovator Capabilities* - Traits - Competencies *Solution Dimensions* - Tangible - Intangible - Qualifiers: Desirable, Viable, and Feasible	*Contextual Conditions* - Unmet Needs *Structural Conditions* - Organizational Systems	*Value Generation & Delivery* - Clinical - Professional - Systemic *Unintended Consequences* - Failure	Culture of Innovation Diffusion of Innovation	NR
23	Porter-O'Grady, 2003 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty - Degree of Change - Pace of Change *Innovator Capabilities* - Traits - Competencies - Behaviour *Innovation Process* - Problem Definition *Solution Dimensions* - Intangible	*Contextual Conditions* - Opportunities Identification *Structural Conditions* - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Systemic	NR	NR

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Table 3 (*continued*)

Ref.	Author, Year of Publication, and Country	Theoretical Framework	Study Type/ Design	Sample (RR)	Rodgers' Components				
					Attributes	**Antecedents**	**Consequences**	**Surrogate Terms**	**Related Concepts**
24	Price, 2006 United Kingdom	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty *Innovator Capabilities* - Traits - Competencies - Behaviour *Innovation Process* - Problem Definition *Solution Dimensions* - Tangible - Intangible - Qualifiers: Desirable and Viable	*Contextual Conditions* - Unmet Needs - Emerging Demands *Structural Conditions* - Organizational Systems	*Value Generation & Delivery* - Experiential - Systemic - Social	NR	NR
25	Raderstorf et al., 2022 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty *Innovator Capabilities* - Competencies *Innovation Process* - Implementation *Solution Dimensions* - Tangible - Intangible	*Contextual Conditions* - Unmet Needs - Opportunities Identification *Structural Conditions* - Organizational Systems	*Value Generation & Delivery* - Experiential - Professional - Systemic - Social *Solution Dimensions* - Qualifier: Beneficial	Culture of Innovation Innovation Metrics	Change Management Technology Co-Design
26	Rylee & Cvanagh, 2023 United States of America (USA)	NR	Literature review/ scoping review	n = 24 records	*Innovation Characteristics* - Perceived Novelty - Degree of Change *Innovator Capabilities* - Traits - Competencies - Mindset - Behaviour *Innovation Process* - Idea Generation - Outcome Measurement - Sustainability *Solution Dimensions* - Tangible - Intangible - Mixed	*Contextual Conditions* - Unmet Needs - Emerging Demands *Structural Conditions* - Innovation Education - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Systemic *Unintended Consequences* - Failure *Solution Dimensions* - Tangible - Intangible - Mixed - Qualifier: Beneficial	Culture of Innovation	NR
27	Shiparski & Authier, 2013 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty - Degree of Change *Innovator Capabilities* - Traits - Competencies - Mindset - Behaviour *Innovation Process* - Idea Generation *Solution Dimensions* - Intangible - Mixed	*Contextual Conditions* - Opportunities Identification - Emerging Demands *Structural Conditions* - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Systemic	Innovation Mindset Innovation Behaviour Innovation Leadership Culture of Innovation	Quality Improvement Technology (Data Science)
28	Snide & Nailon, 2013 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty - Pace of Change *Innovator Capabilities* - Traits *Innovation Process* - Sustainability *Solution Dimensions* - Tangible - Intangible	*Structural Conditions* - Innovator Capability	*Value Generation & Delivery* - Clinical - Experiential - Systemic - Social	Organizational Innovation	Quality Improvement
29	Snyder-Halpern, 1996 United States of America (USA)	Health Care System Innovation Model	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty *Innovation Process* - Qualifier: Systematic *Solution Dimensions* - Tangible - Intangible - Qualifiers: Desirable, Viable, and Feasible	*Contextual Conditions* - Emerging Demands *Structural Conditions* - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Systemic *Solution Dimensions* - Tangible - Qualifier: Beneficial	NR	NR

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Ref.	Author, Year of Publication, and Country	Theoretical Framework	Study Type/ Design	Sample (RR)	Rodgers' Components				
					Attributes	**Antecedents**	**Consequences**	**Surrogate Terms**	**Related Concepts**
30	Stout et al., 2023 United Kingdom	NR	Literature review /scoping review	n = 17 records	*Innovation Characteristics* - Nature - Perceived Novelty - Degree of Change *Innovator Capabilities* - Traits - Competencies - Mindset - Behaviour *Innovation Process* - Sustainability *Solution Dimensions* - Tangible - Intangible	*Contextual Conditions* - Unmet Needs - Emerging Demands *Structural Conditions* - Organizational Systems	*Value Generation & Delivery* - Experiential - Professional - Systemic	Innovation Behaviour	Technology Design Thinking Entrepreneurship
31	Thomas et al., 2016 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty - Degree of Change *Innovator Capabilities* - Traits - Competencies - Mindset - Behaviour *Innovation Process* - Knowledge Creation - Outcome Measurement *Solution Dimensions* - Tangible - Intangible - Mixed	*Structural Conditions* - Innovation Education - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Professional - Systemic - Social	Innovation Mindset Innovation Behaviour	Leadership Quality Improvement Technology (Telehealth/ Electronic Health Records)
32	Tross & Cavanagh, 1996 United Kingdom	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty *Innovator Capabilities* - Traits - Competencies - Behaviour *Innovation Process* - Problem Definition *Solution Dimensions* - Tangible - Intangible - Qualifier: Viable	*Structural Conditions* - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Experiential - Systemic *Unintended Consequences* - Failure	Innovation Behaviour Innovation Management	Quality Improvement
33	Tsai et al., 2013 Taiwan	NR	Research /cross-sectional	n = 32 award winners (RR 31%) n = 506 nona-warded (RR 98%)	*Innovation Characteristics* - Perceived Novelty *Innovator Capabilities* - Traits - Behaviour *Innovation Process* - Idea Generation *Solution Dimensions* - Tangible - Intangible - Mixed - Qualifier: Desirable	*Structural Conditions* - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Systemic	NR	Design
34	Weatherford et al., 2018 United States of America (USA)	NR	Research/ Delphi	n = 38 nursing innova-tion experts (RR NR)	*Innovation Characteristics* - Perceived Novelty *Innovator Capabilities* - Traits - Competencies *Solution Dimensions* - Intangible - Qualifier: Viable	*Structural Conditions* - Innovation Education - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential *Unintended Consequences* - Failure	Innovation Leadership Culture of Innovation	NR
35	Weng et al., 2016 Taiwan	NR	Research/cross-sectional	n = 368 frontline nurses (RR 90.2%)	*Innovator Capabilities* - Traits *Innovation Process* - Idea Generation - Knowledge Creation - Diffusion - Outcome Measurement *Solution Dimensions* - Tangible - Intangible - Mixed - Qualifier: Desirable	*Contextual Conditions* - Unmet Needs *Structural Conditions* - Innovation Education - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Systemic - Social *Solution Dimensions* - Tangible - Intangible - Qualifier: Beneficial	Innovation Behaviour	Leadership

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Table 3 (*continued*)

Ref.	Author, Year of Publication, and Country	Theoretical Framework	Study Type/ Design	Sample (RR)	Rodgers' Components				
					Attributes	Antecedents	Consequences	Surrogate Terms	Related Concepts
36	Weng et al., 2012 Taiwan	NR	Research study/ cross-sectional	n = 808 frontline nurses and nursing managers (RR 76.3%)	*Innovation Characteristics* - Degree of Change *Innovator Capabilities* - Traits *Innovation Process* - Idea Generation - Knowledge Creation - Implementation - Diffusion - Qualifier: Multistage *Solution Dimensions* - Tangible - Intangible - Mixed - Qualifier: Desirable	*Contextual Conditions* - Emerging Demands *Structural Conditions* - Innovation Education - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Systemic	Innovation Behaviour Diffusion of Innovation	NR
37	Weng et al., 2013 Taiwan	NR	Research study/ cross-sectional	n = 808 frontline nurses and nursing managers (RR 76.3%)	*Innovation Characteristics* - Perceived Novelty *Innovator Capabilities* - Traits *Innovation Process* - Knowledge Creation - Diffusion *Solution Dimensions* - Tangible - Intangible	*Contextual Conditions* - Emerging Demands *Structural Conditions* - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Systemic	Innovation Behaviour Diffusion of Innovation	NR
38	Weston, 2009 United States of America (USA)	NR	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Perceived Novelty - Degree of Change - Pace of Change *Innovator Capabilities* - Traits *Innovation Process* - Knowledge Creation *Solution Dimensions* - Intangible	*Contextual Conditions* - Unmet Needs - Opportunities Identification *Structural Conditions* - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Systemic	NR	NR
39	White et al., 2016 United States of America (USA)	NR	Research study/ observational	n = 347 nurses (RR 25%)	*Innovation Characteristics* - Degree of Change *Innovator Capabilities* - Traits - Competencies *Innovation Process* - Idea Generation - Implementation *Solution Dimensions* - Tangible - Intangible - Qualifiers: Desirable and Feasible	*Structural Conditions* - Innovation Education - Leadership Support	*Value Generation & Delivery* - Clinical - Systemic - Social *Solution Dimensions* - Qualifier: Beneficial	NR	NR
40	Williams and McMurray, 2003 Australia	NR	Research study/ observational	Survey 1: n = 82 nurse managers (RR 58%) Survey 2: n = 94 nurse managers (RR 47%)	*Innovation Characteristics* - Perceived Novelty - Degree of Change *Solution Dimensions* - Tangible - Intangible	*Structural Conditions* - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Systemic	Innovation Behaviour	Leadership
41	Yan et al., 2022 China	NR	Research study/ qualitative	n = 14 nurses	*Innovation Characteristics* - Perceived Novelty *Innovator Capabilities* - Traits - Competencies - Behaviour *Innovation Process* - Idea Generation - Qualifier: Multistage *Solution Dimensions* - Tangible - Intangible	*Contextual Conditions* - Unmet Needs *Structural Conditions* - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential - Professional - Systemic *Unintended Consequences* - Failure *Solution Dimensions* - Intangible - Qualifier: Beneficial	Innovation Behaviour	Leadership

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Table 3 (*continued*)

Ref.	Author, Year of Publication, and Country	Theoretical Framework	Study Type/ Design	Sample (RR)	Rodgers' Components				
					Attributes	Antecedents	Consequences	Surrogate Terms	Related Concepts
42	Zuber & Moody, 2018 United States of America (USA)	NR	Research/ qualitative	n = 125 clinical nurses	*Innovation Process* - Empathizing with Unmet Needs - Idea Generation - Knowledge Creation (Prototyping and Testing) *Innovator Capabilities* - Competencies *Solution Dimensions* - Qualifiers: Desirable, Viable, and Feasible	*Contextual Conditions* - Unmet Needs - Opportunities Identification - Emerging Demands *Structural Conditions* - Innovation Education - Organizational Systems	*Value Generation & Delivery* - Clinical - Experiential *Solution Dimensions* - Tangible - Mixed	Organizational Innovation	Human-Centered Design (HCD)
43	Zuber & Weberg, 2020 United States of America (USA)	Complex Systems Theory	Discussion/ theoretical paper	NA	*Innovation Characteristics* - Nature - Perceived Novelty - Degree of Change *Innovator Capabilities* - Traits - Competencies - Behaviour *Innovation Process* - Idea Generation - Implementation *Solution Dimensions* - Tangible - Intangible	*Structural Conditions* - Innovator Capability - Leadership Support - Organizational Systems	*Value Generation & Delivery* - Clinical - Systemic	Innovation Mindset Organizational Innovation Culture of Innovation Innovation Microclimate	Leadership Human-Centered Design (HCD)

Note. NR = not reported/NA = not applicable/RR = response rate.

The *contextual conditions* preceding nursing innovation comprise *unmet needs*, *opportunity identification*, and *emerging demands*. *Unmet needs* are generated by i) human needs arising from patients', communities', and populations' lived experiences, expectations, and/or evolving conditions (1, 22, 3, 4, 8, 10, 11, 14, 16, 18, 19, 24, 25); ii) care delivery gaps arising from inefficiencies, risks, and/or failures in clinical practice (2, 5, 11, 16, 18, 21, 30, 38, 41, 42); iii) professional and organizational challenges arising from nursing practice complexity, workforce pressures, team dynamics, and organizational strain (1, 4, 8, 13, 14, 16, 21, 26, 30, 41, 42); and iv) resource-driven needs arising from health system constraints and pressures (3, 10, 14, 15, 16, 17, 18, 22, 24, 25, 30, 42).

Opportunity identification is pushed through nursing: i) positionality, expertise, and professional practice awareness (13, 15, 23–25, 27, 38); and ii) analysis, perception, feasibility assessment, and knowledge gaps (2, 10–12, 14, 16, 18, 42) with organizational, market, and system-context awareness (10, 11, 13, 42). *Emerging demands* originate from i) population, workforce, societal, and regulatory shifts with changes in patient expectations, demographics, workforce roles, and regulatory environments (3, 8, 9, 10, 12, 13, 16, 18, 20, 21, 24); ii) pressures driven by healthcare market dynamics, competition, and economic constraints (10, 16, 26, 29, 42); and iii) advancements in science, technology, data, and models of care (12, 27, 30). All other contextual conditions were reported less than three times. Importantly, an empirical cross-sectional study in the sample reported competitor orientation as a crucial driver of nursing innovation, demonstrating a significant positive cross-level impact (37).

Structural conditions also precede nursing innovation by building capacity through *innovation education*, *professional capabilities*, *leadership support*, and *organizational systems*. Articles included in the sample reported that *innovation education* critically precedes nursing innovation (1, 3, 6–8, 10, 12, 14, 15, 21, 26, 31, 36, 39, 40, 42) in learning environments that support experiential, applied, and collaborative innovation learning (6, 19, 21, 34, 35, 39). It includes structuring educational pathways that embed innovation into undergraduate, graduate, leadership, and continuing education programs (3, 7, 13, 21, 31, 34, 35, 39). Education also enables the development of *professional capabilities* required by allowing nursing staff to change their ways of thinking and acting innovatively (4, 8, 10, 19, 23, 31, 38, 41). These capabilities also include professionals being aware that their position, experience, skills, and influence, coupled with their personal characteristics, enable innovation (3, 5, 10, 14, 18, 19, 26, 27, 31, 33, 36, 40, 41). An empirical cross-sectional study in the sample demonstrated that educational background, position, and work environment significantly influence innovation levels (36). Therefore, when nursing professionals understand the value of their contributions, they can feel empowered to advocate for nursing innovation (5, 17, 20, 32, 43).

In addition to the aforementioned conditions, *leadership support* is a critical structural condition for fostering nursing innovation. *Leadership support* is imperative for building capacity that enables innovation by providing resources, structures, and operational assets (1, 2, 4–6, 16, 19, 26, 27, 31, 35, 37, 38, 40, 41, 43). For this concept analysis, we draw on Cummings' definition of nursing leadership as "being able to see the present for what it really is, see the future for what it could be, and then take action to close the gap between today's reality and the preferred future of tomorrow" (Cummings, 2012, p. 3325). In nursing innovation, to close the gap between today's reality and the preferred future of tomorrow, nursing leaders are expected to create and sustain work environments where innovation is normalized, supported, and rewarded (9, 16, 17, 26, 27, 31, 33, 34, 38, 40, 41). It requires providing mentorship, skill development, awareness of leadership styles, and tolerance for risk to foster innovation capacity (1, 2, 3, 6, 7, 10, 16, 31, 32, 34, 36, 37, 39–41, 43). It also involves leadership advocacy actions that amplify nursing's voice to align innovation with strategic engagement (1, 9, 15, 20, 23, 26, 27, 34). Relational nursing leadership styles that cultivate trust, collaboration, and professional autonomy have been empirically shown to drive nursing innovation (39).

Finally, *organizational systems* refer to multilevel conditions within organizations that enable nursing innovation. It involves aligning innovation with mission, values, governance structures, and communication processes, ensuring coherence and legitimacy across the organization (1, 2, 3, 4, 6, 10, 16, 18–20, 24, 26, 27, 32, 38, 42). Once the vision is set, it is also critically important to create formal infrastructures and operational systems that provide the tangible capacity for innovation to occur and be sustained (1, 2–4, 6, 8, 10–13,

15, 16, 18–20, 24–26, 30–32, 34, 35, 38, 40, 41). For instance, allowing for dedicated time, space, and permission for innovation activities (4, 12, 31), creating spaces dedicated to innovation (13, 24, 26), as well as promoting programs and building processes that facilitate innovation growth (1, 11, 24, 38), are infrastructure elements that should be enhanced to enable nursing innovation to flourish. Nursing innovation emerges from frontline experiences and suggests healthcare institutions must foster supportive environments to cultivate nursing-led innovation (40). Additionally, setting an organizational culture/climate for innovation was also described as an important antecedent, as they frame how innovation is perceived, supported, and enacted in everyday organizational life (2–4, 10, 11, 13, 20, 22, 23, 25–27, 29, 31, 32, 34–38, 40, 41, 43). Organizational climates characterized by fairness, trust, recognition, supervisory encouragement, and support were empirically found to foster innovation (40). Another important condition to consider is the connections among people, teams, and systems in relational networks that enable innovation through collaboration, diversity, and interconnection (1, 2, 6, 12, 13, 20, 24, 27, 31, 37, 38, 41, 43). Once connected, multiple stakeholders can engage toward a shared goal.

Consequences of Nursing Innovation

The consequences of nursing innovation were described in all articles included in the sample according to three main themes: (a) *value generation and delivery* (*clinical, experiential, professional, systemic, and social value*); (b) *unintended consequences* (*failure* and *learning from failure*); and (c) *solution dimensions*.

Nursing innovation generates and delivers five types of values spanning from micro- to macro-levels. The micro-level values encompass *clinical*, *experiential*, and *professional values*. *Clinical value* refers to improvements in patient care and clinical outcomes (1–6, 8–15, 17, 18, 21–23, 26–29, 31, 34–39, 41–43) and enhancement of population health (3, 6, 9, 12, 21, 22, 26, 27, 31, 34, 37). *Experiential value* encompasses the patient/consumer experience (2, 3, 6, 7, 10, 11, 21, 23, 25–28, 30, 31, 42, 41) and the fulfillment of unmet or evolving human needs (1–3, 6, 7, 10, 14, 24, 29–31, 35). *Professional value* includes nursing professional growth and career advancement (1, 3, 5, 13, 14, 17, 30, 41), and knowledge learning that strengthens professional capability (1, 8, 9, 10, 14, 22, 25, 31). The macro-level values encompass *systemic* and *social values*. *Systemic value* refers to the improvement of organizational functioning (1–3, 5–11, 13–16, 20–22, 26–28, 30–32, 35, 39, 41), the enhancement of changes to the work environment (3, 5, 7, 9, 10, 14–16, 23–26, 30–33, 35–37, 40), health system redesign for transformation (2–3, 5, 8, 10, 11, 13–15, 20–22, 26, 29, 31, 35, 36, 39, 41), and business model transformation for competitive positioning (9, 10, 12, 18, 25, 26, 32, 35, 37–39). *Social value* includes population health and well-being (1, 8, 11, 15, 18, 21, 24, 28, 31, 35), in addition to health equity, social justice, and the right to health (3, 10, 11, 13, 14, 25, 31, 39). All other values at the micro- and macro-levels were reported fewer than eight times.

Critically, a small subset of articles described *unintended consequences* as possible outcomes of nursing innovation, including *failure* (1, 21, 22, 26, 32, 34, 41) and *learning from failure* (8, 20). Failures can lead to a series of errors and adverse patient outcomes (25). However, failure can also be seen as valuable, as it can transform serious healthcare crises into lessons to be learned (8, 20). Additionally, another small subset of articles described the solution as the outcome of the innovation process. Solutions can be tangible (e.g., products, technologies, and methods; 4, 8, 10, 12, 14, 26, 29, 35, 42), intangible (e.g., processes; 4, 8, 9, 26), or hybrid (tangible and intangible, e.g., services; 10, 14, 26, 42). As a consequence of nursing innovation, solutions must be beneficial to the ecosystem (4, 9, 12, 17, 18, 25, 26, 39, 41, 42).

Surrogate Terms

Across the included sources, the authors conceptualize nursing innovation using several related yet distinct concepts, often treating these terms as interchangeable with nursing innovation. Surrogate terms most frequently examined in this category include culture of innovation (3, 5, 6, 10, 14, 19, 22, 25–27, 34, 43), innovative behavior and innovative work behavior (14, 27, 30–32, 35–37, 40, 41), innovation mindset (3, 9, 13–15, 27, 31, 42), innovation leadership (1, 3, 4, 19, 27, 34), organizational innovation (7, 8, 10, 28, 42, 43), diffusion of innovation (21, 22, 36, 37), innovation management (6, 10, 20, 32), and open innovation initiatives, including hackathons (5, 15, 18) and incubators/accelerators (3, 5, 15).

Related Concepts

Nursing innovation has frequently been described using several related concepts. Articles included were grouped into five categories: (a) management, including leadership (1, 10, 11, 20, 31, 35, 40, 41, 43), change management (1, 3, 7, 10, 17, 25), and quality improvement (QI; 15, 27, 28, 31, 32); (b) technology, including artificial intelligence (AI; 9, 12, 17), big data and analytics (7, 9, 27), electronic health records (EHRs; 4, 9, 31), and telehealth (12, 17, 31); (c) design, including human-centered design (HCD; 3, 15, 17, 19, 42, 43) and design thinking (DT; 4, 15, 17, 18, 30); (d) business, including entrepreneurship (8, 10, 15, 30); and (e) innovation protection, including intellectual property (IP; 1, 12, 15). All other terms were reported less than two times.

Exemplar

According to Rodgers' evolutionary method, exemplars are used to illustrate the concept clearly within real-life contexts (Rodgers & Knafl, 2000). Box 1 presents an exemplar that demonstrates the practical application of the conceptual components of nursing innovation in a real-world situation.

Nursing Innovation Defined

Following extensive deliberation within the research team on the analysis and interpretation of data generated by this concept analysis, we propose a consistent definition of nursing innovation (Table 4).

The proposed definition conceptualizes nursing innovation as a distinctly nursing phenomenon grounded in both disciplinary ontology and epistemology. Ontologically, nursing innovation is understood as a nursing-led practice of transforming present realities into preferred futures, reflecting nursing's relational responsiveness, situated practice, and ethical commitment to advancing well-being across individuals, populations, and global health ecosystems. This future-oriented perspective positions innovation as an ongoing professional practice that responds to the complexities of contemporary health ecosystems. Epistemologically, nursing innovation is enacted through the design and implementation of solutions that intentionally draw on nursing knowledge, including practice-based, experiential, contextual, and value-informed ways of knowing. *Consequently, nursing innovation is recognized as the means through which preferred futures become possible and is distinguished by the application of nursing's unique disciplinary knowledge to generate meaningful solutions.* Together, these ontological and epistemological dimensions position nursing innovation as a form of nursing praxis that integrates future-oriented thinking with disciplinary knowledge to advance well-being across interconnected levels of health and care (see Figure 2).

Discussion

Addressing long-standing definitional ambiguity, this concept analysis provides a comprehensive and robust conceptual foundation for nursing innovation, moving beyond unidimensional interpretations toward an integrated understanding that brings together

Box 1
Exemplar of Nursing Innovation

Gifty, a registered nurse, experienced a profound personal loss when she learned that her sister-in-law had died during pregnancy. This tragedy reflects a broader and persistent reality for many Black women globally, for whom access to timely and appropriate healthcare is often constrained by structural inequities, geographic distance, and systemic barriers. In such contexts, preventable maternal morbidity and mortality remain unacceptably high. Motivated by this tragedy and informed by her lived experience as a Black woman and nurse within a healthcare system marked by persistent maternal health inequities, Gifty became determined to prevent other families from enduring similar loss. Guided by a commitment to improving the health and well-being of individuals and populations, she partnered with a nursing colleague, Yvonne, to take purposeful action toward a preferred future. Although neither had prior experience in innovation, they recognized the critical importance of acting to address this critical unmet need in maternal health outcomes. At the time, their hospital was supporting an innovation program that enabled global nursing innovators to design and implement solutions that generate and deliver value for individuals, populations, and health ecosystems. The interdisciplinary program explicitly positioned nurses as innovators, while also engaging other health professionals. Participants were expected not only to design innovative solutions but also to implement them in practice, demonstrating varying degrees of innovativeness through invention or reinvention and producing either incremental or rapid-cycle change. Through their participation, Gifty and Yvonne developed their capabilities as nursing innovators by adopting an innovation-oriented mindset, acquiring innovation-related competencies, and engaging in innovation behaviors. The program introduced an interactive innovation process grounded in design principles that guided participants in empathizing with unmet needs, defining problems, generating ideas, and creating knowledge through prototyping and testing. Emphasis was also placed on implementation, evaluation, and outcome measurement to support sustainability over time. As an outcome of this process, Gifty and Yvonne, working collaboratively with an interdisciplinary team, developed MAMA-CVD, a culturally safe solution addressing one of the leading causes of maternal mortality among Black women. The innovation employs artificial intelligence (enabled ultrasound technology) to support early detection and assessment of cardiovascular disease in pregnancy. Beyond improving access to timely maternal cardiac care, the solution also empowers unemployed and underemployed nurses and midwives to deliver point-of-care ultrasound assessments, thereby generating clinical, professional, systemic, and social value within underserved communities.

Note. This exemplar reflects an adapted real-life case. All individuals involved provided informed consent for the use and dissemination of their experiences for scholarly purposes.

Table 4
Nursing Innovation Defined

Definition	
Nursing innovation is the nursing-led practice of transforming present realities into preferred futures through the design and implementation of solutions that intentionally draw on nursing knowledge to advance the well-being of individuals, populations, and global health ecosystems.	
Dimension	**Description**
Ontology (what nursing innovation is)	The nursing-led practice of transforming present realities into preferred futures.
Epistemology (how nursing innovation is enacted)	Through the design and implementation of solutions intentionally drawing on nursing knowledge.
Purpose (why nursing innovation exists)	To advance the well-being of individuals, populations, and global health ecosystems.

its multiple dimensions as a heuristic to support the nursing discipline's knowledge base. We discuss the implications of our findings by examining: i) their philosophical foundations, ii) the evolution of nursing innovation toward conceptual maturity, iii) the implications for the nursing discipline, profession, and science, and iv) the translation of knowledge into practice across global health ecosystems.

Philosophical Foundations of Nursing Innovation

As the conceptualization of nursing innovation matures, examining its philosophical foundations (including ontological and epistemological perspectives) is essential to clarify the underlying assumptions that guide its meaning and application in nursing. Fawcett (2017) conceptualizes ontology in nursing as assumptions

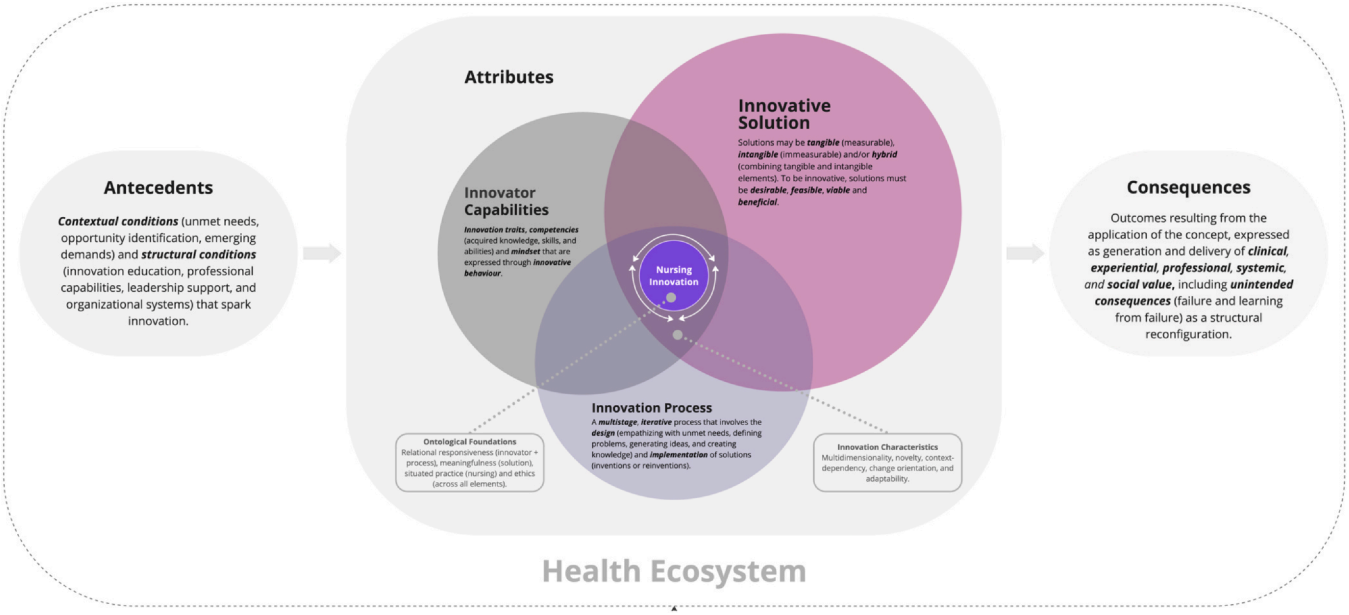


Figure 2. Conceptual model of nursing innovation.

about the nature of reality, including what entities and processes are understood to exist within nursing practice and knowledge, and how these are related. Within this concept analysis, our findings indicate that nursing innovation is characterized by attributes of multidimensionality (Ferraz et al., 2021; Gilmartin, 1998; Stout et al., 2023), context-dependency (Blakeney et al., 2009), adaptability (Blakeney et al., 2009; Kaya et al., 2015; Weston, 2009; Zuber & Weberg, 2020), novelty (Albert, 2018; Babington, 1993; Beaudet et al., 2023; Blakeney et al., 2009; Collins & McClellan, 2023; Davis & Marshall, 2014; Demiris et al., 2020; Fuller & Hansen, 2019; Gilmartin, 1998; Hughes, 2006; Iuppa, 2022; Joseph et al., 2019a; Joseph et al., 2019b; Kagan et al., 2021; Koppel & Sullivan, 2022; Manion, 1993; Noles et al., 2019; Nursing, 2009; Porter-O'Grady, 2003; Price, 2006; Rylee & Cvanagh, 2023; Snide & Nailon, 2013; Stout et al., 2023; Tross & Cavanagh, 1996; Tsai et al., 2013; Weng et al., 2012; Weston, 2009; White et al., 2016; Yan et al., 2022; Zuber & Weberg, 2020), and an orientation toward change (Albert, 2018; Beaudet et al., 2023; Blakeney et al., 2009; Collins & McClellan, 2023; Davis & Marshall, 2014; Demiris et al., 2020; Fuller & Hansen, 2019; Gilmartin, 1998; Hughes, 2006; Kagan et al., 2021; Koszalinski et al., 2021; Noles et al., 2019; Nursing, 2009; Stout et al., 2023; Tsai et al., 2013; Weng et al., 2012; Weng et al., 2013; Weston, 2009; White et al., 2016; Zuber & Weberg, 2020). In addition, nursing innovation encompasses distinct yet interrelated dimensions involving the innovator, the innovation process, and the innovative solution. Collectively, these attributes suggest that, ontologically, nursing innovation is grounded in relational responsiveness (innovator and innovation process), meaningfulness (innovative solution), situated practice (nursing), and ethical commitment (ontological moral ground across all elements), all of which are consistent with nursing's disciplinary foundations.

From an epistemological perspective (concerned with how knowledge is generated and applied; Risjord, 2010), nursing innovation is distinguished not only by its alignment with nursing's ontological foundations but also by how it is designed and implemented through nursing practice. That is, nursing innovation is "nursing" because it draws on nursing knowledge, including practice-based, experiential, contextual, and value-laden ways of knowing, and because it is realized through the interpretive and practical work of nurses across diverse contexts. In this sense, nursing innovation is not merely the introduction of an innovative solution into nursing, but a form of knowledge-in-practice that emerges through nurses' engagement with the contextual and structural conditions that give rise to innovation. This interpretation is consistent with nursing scholarship that views knowledge as situated in practice and shaped by disciplinary commitments, rather than as detached from the contexts in which it is used (Risjord, 2010).

Therefore, nursing innovation is nursing not solely because its subject matter lies within nursing, but because it is grounded in nursing ontology and realized through nursing epistemology. Advancing a philosophical understanding of nursing innovation requires greater coherence between the ontological foundations of nursing and the epistemological processes through which innovation is designed and implemented. At present, the philosophical foundations of nursing innovation remain emergent and warrant further rigorous scholarly examination.

Evolution of Nursing Innovation Over Time Toward Conceptual Maturity

The conceptualization of nursing innovation has its origins in multiple disciplines, including management, business, economics, and the social sciences. The concept was introduced into the nursing literature in the early 1990s, with a steady growth in scholarly publications thereafter. A marked increase in attention is evident from 2013 onward, followed by a sustained concentration of publications between 2019 and 2023. Despite this expansion, the phenomenon has been inconsistently conceptualized across the literature and defined using several related yet distinct concepts and constructs, contributing to ambiguity in its precise definition. Such terms include creativity, technology, innovation behavior, and culture of innovation, among others. Additionally, as a multidimensional phenomenon, nursing innovation has been conceptualized with varying emphases on the innovator, the innovation process, or the resulting innovative solution, rather than a unified depiction. Innovation has also been used as an adjective in the nursing literature to qualify research studies, interventions, or practices as innovative without adherence to scientifically established criteria for evaluating whether the outcome truly constitutes an innovation. This fragmented conceptualization over time contributed to conceptual dilution and led to conflations of the use of the term "nursing innovation," potentially weakening the conceptual delineation and maturation of the term within nursing scholarship.

Temporal analysis suggests a gradual evolution in how nursing innovation is understood, characterized by: i) a shift from predominantly top-down models toward greater recognition of frontline nurses as primary drivers of innovation (McSherry & Douglas, 2011); ii) an increasing emphasis on context-specific, rather than standardized conceptualizations of innovation (McSherry & Douglas, 2011); and iii) a movement from nurses engaging informally in innovation practices toward the emergence of a more formalized "nurse innovator" role, which remains in need of further clarification (Stout et al., 2023). This is important in delineating its boundaries in relation to related concepts from broader fields, such as healthcare innovation, and the nursing discipline, such as nursing innovative behavior. Healthcare innovation is generally framed through a system-oriented lens, often focusing on macro-level challenges related to systemic efficiency (Omachonu, 2010; Weberg, 2009), whereas our findings demonstrate that nursing innovation employs a relational and contextual lens emphasizing interconnectedness. However, how nursing innovation contributes to and interacts with broader healthcare innovation remains poorly understood. Greater conceptual clarity is essential to articulate nursing's distinctive contribution while fostering interdisciplinary innovation capable of addressing increasingly complex health system and societal challenges. Additionally, findings from a concept analysis of nursing innovative behavior demonstrate that it is conceptualized as an individual characteristic, typically referring to a nurse's intention to engage in innovation-related actions (Asurakkody & Shin, 2018), which contrasts significantly with our proposed nursing innovation definition in terms of scope and systemic relevance.

Nonetheless, heightened attention to innovation in healthcare during the COVID-19 pandemic (Barr et al., 2021) may further accelerate scholarly discourse on nursing innovation amid ongoing system-level challenges. Persistent calls for definitional consensus across the literature (Kaya et al., 2015; Stout et al., 2023) suggest that nursing innovation remains an emerging (but not nascent) rather than mature concept within the discipline. Examining nursing innovation over time indicates a gradual but uneven evolution in how the concept has been understood within the discipline.

Implications for the Nursing Discipline and Profession

Nurses' responses to change have often been labeled as resistance, despite conceptual evidence suggesting that such responses more accurately reflect efforts to preserve baseline practice rather than an inherent opposition to change (DuBose & Mayo, 2020). While this tendency may be critical to safeguarding the nature of nursing practice, nursing has nevertheless continuously adapted to change throughout its history, often without explicit recognition or articulation of this adaptive work (Benner et al., 2009). More than ever, global health ecosystems require innovation to navigate the increasing pressures of an era marked by accelerating

change (Atun & Moore, 2021). As our findings show, these pressures create contextual conditions that precede the emergence of nursing innovation. However, nursing innovation does not arise in isolated contexts. Structural conditions are also critical to enable nurses to apply their capabilities in designing and implementing innovative solutions. Importantly, as unmet needs evolve, not all warrant innovative responses, and nurses are strategically positioned to exercise judgment in determining which needs require innovation. Being strategically positioned, however, does not necessarily equate to being prepared to lead innovation, reinforcing the need for structural conditions that enable and support nursing-led innovation.

The nursing profession has long been underrecognized, undervalued, and politically underrepresented within health systems (World Health Organization, 2025). This pattern extends to the domain of nursing innovation, where nurses' contributions have similarly been underrecognized and undervalued (International Council of Nurses, 2009). Importantly, the evidence in this study indicates that nursing-led innovation is not about establishing professional hegemony within global health ecosystems. While nursing innovation may emerge as an individual capability, it also flourishes within interdisciplinary teams, particularly in environments where trust enables individuals to collaboratively build upon shared ideas (Davis & Marshall, 2014; Kagan et al., 2021; Koszalinski et al., 2021; Shiparski & Authier, 2013; Weatherford et al., 2018). In these collaborative and cross-functional environments, creativity emerges through divergent thinking and a power balance in which democracy is valued (Beaudet et al., 2023; Joseph et al., 2019b; Rylee & Cvanagh, 2023; Shiparski & Authier, 2013; Weston, 2009; Zuber & Weberg, 2020). Interdisciplinarity has been widely identified as a critical yet underdeveloped component of healthcare practice (Reeves et al., 2017), and nursing innovation may offer an important pathway for strengthening collaboration across professional boundaries.

Although nursing has been consistently recognized as the most trusted healthcare profession (Brenan, 2017), the design and implementation of nursing-led innovations within practice have often been constrained. This may be partly attributable to nurses' reluctance to assume risk in practice to protect patient safety (Yan et al., 2022). Accepting that innovation inherently involves risk requires a clear understanding that it does not entail deviating from established scientific standards or compromising the quality of care (Davis & Marshall, 2014; White et al., 2016). Rather, it calls for embracing calculated risk and acknowledging that failure may occur as part of meaningful progress. Failure itself exists along a spectrum—ranging from preventable to complex to intelligent failures (Edmondson, 2011)—and nurses require a supportive infrastructure that provides safe spaces to fail, learn, and adapt (Manion, 1993; Orellano & Gourc, 2025), alongside the development of risk management competencies to manage risk effectively throughout the innovation process.

It is also important to consider that nursing innovation may be expressed differently across countries due to cultural and systemic factors. Although unmet needs often arise in contexts of high necessity, the articles included in the sample are predominantly drawn from high-income countries (Metreau et al., 2024). This observation highlights the possibility that differences in health ecosystems across countries (particularly in resources, governance, and professional roles) shape how nursing innovation is conceptualized, supported, and enacted. Given the context-dependent nature of nursing innovation, the absence of comparative evidence across countries represents a significant gap in the literature and warrants further investigation. Moreover, because nursing innovation requires robust contextual and structural conditions to emerge, low-income countries may face substantial barriers due to limited resources, infrastructure, and institutional support. These challenges are likely to be compounded by projected nursing workforce shortages in many low-income regions by 2030 (World Health Organization, 2025).

Implications for Nursing Science Toward Nursing Innovation Theory

Sources included in our sample draw on established innovation theories originating outside the nursing discipline, such as the Diffusion of Innovations theory (Rogers, 2003) and the Jobs-to-be-Done theory (Christensen et al., 2016). In contrast, nursing-specific theories are largely absent from the identified conceptual foundations. This reliance on social and organizational theories suggests that nursing innovation scholarship has drawn heavily on external disciplines rather than on nursing-grounded theoretical frameworks. While this concept analysis advances conceptual clarity, the concept presented is not intended to serve as a definitive or absolute definition of nursing innovation. Rather, it provides a foundational heuristic to support ongoing knowledge development. As an evolving and dynamic phenomenon, nursing innovation requires continued conceptual and theoretical exploration.

Advancing nursing science toward a Nursing Innovation Theory will require sustained inductive and deductive inquiry to iteratively inform conceptual refinement, theoretical development, and the generation of disciplinary knowledge. Future studies employing diverse methodological approaches may be informed by hypotheses derived from this concept analysis. Empirical research is needed to apply and test the concept in practice, examining its applicability and boundaries. Literature reviews are also essential for providing a comprehensive examination of the state of knowledge and for analyzing cause-and-effect relationships that may lead to both positive and negative outcomes in nursing innovation. Further evidence is required to elucidate nursing innovation competencies, the mechanisms through which nursing innovation occurs, and the evaluative lenses used to distinguish innovation and determine the conditions under which it arises. Field-based studies may be particularly valuable for assessing the concept's utility in real-world contexts and for refining or expanding its boundaries. To advance Nursing Innovation Theory, scholars must remain attentive to the evolving state of knowledge in the field, thereby minimizing conceptual overlap and theoretical redundancy.

Implications for the Translation Into Practice Within Global Health Ecosystems

Within increasingly constrained global health ecosystems, nursing innovation represents not merely an opportunity but a requirement for advancement and transformation. As the nursing-led practice of transforming present realities into preferred futures, nursing innovation can lead to positive and negative outcomes. Findings from this study suggest that value emerges as a central consequence of nursing innovation. We draw on Atun's conceptualization of value as the extent to which health systems generate sustained improvements in health and well-being while using resources efficiently, equitably, and responsively over time (Atun & Moore, 2021). However, the literature extensively reports positive outcomes while comparatively overlooking unintended consequences. As a result, it remains unclear whether nursing innovation is assumed to rarely produce adverse outcomes and should therefore be accelerated, or whether the field lacks sufficient empirical and conceptual attention to failure as an outcome.

Given that innovation is inherently characterized by processes of experimentation and trial-and-error, in which mistakes are both common and instructive (Blakeney, 2009), a more explicit examination of negative outcomes is essential. Attending to unintended consequences is not only critical for advancing innovations that are desirable, viable, and feasible (Zuber & Moody, 2018) but also for ensuring that nursing innovation contributes to beneficial,

responsible, and sustainable solutions within global health ecosystems. Importantly, attention should be given to clarifying what does or does not qualify something as innovative (Rylee & Cvanagh, 2023). Finally, by clarifying the concept of nursing innovation, the findings of this study may support healthcare decision-makers in developing a more nuanced understanding of what constitutes and what does not constitute nursing innovation, the antecedents that give rise to it across diverse health ecosystems, and its potential individual, professional, and organizational systems' consequences. This clarity is essential for creating conditions that enable and support nursing innovation.

Limitations

Some limitations should be considered in interpreting the findings of this concept analysis. First, the included literature predominantly originated from high-income countries, which may limit the generalizability and transferability of the findings to health ecosystems in middle- and low-income countries. Second, the analysis was restricted to articles published in English, Portuguese, and Spanish. Although records published in Chinese, French, and Turkish were identified, they could not be assessed due to the research team's limited language proficiency. Literature published in other languages may offer additional insights into the phenomenon. The exclusion of gray literature further limited the analysis to peer-reviewed scholarly sources and may not fully capture the concept's pragmatic applications. Additionally, because nursing innovation is inconsistently defined across the nursing discipline, some degree of conceptual ambiguity persists despite efforts to delineate its core boundaries. As an evolutionary concept analysis, the findings reflect the concept as it is currently understood and acknowledge that it may continue to evolve as the body of knowledge advances. Despite these limitations, this study provides a foundational conceptual framework to support future theoretical development and empirical inquiry, while envisioning refinement as the concept of nursing innovation continues to evolve.

Conclusion

Greater reliance on nursing-led innovation represents an important opportunity to improve health outcomes across global health ecosystems. As conceptualizations of innovation have evolved from predominantly top-down models toward more relational and contextual approaches, our definition positions nursing professionals as primary sources and drivers of innovation within health ecosystems. Nursing innovation is distinguished by the application of nursing's unique disciplinary knowledge, enabling nurses to recognize present realities, envision preferred futures, and design and implement meaningful solutions that respond to the evolving unmet needs of individuals, populations, and health ecosystems. As nursing and health systems face increasingly complex challenges, a shared understanding of nursing innovation among the nursing workforce, health system decision-makers, and researchers is imperative. The proposed definition provides a heuristic to guide conceptual refinement, theoretical development, and knowledge generation while supporting more informed decision-making that considers both intended and unintended consequences of innovation. Nevertheless, despite efforts to delineate the core boundaries of nursing innovation, continued theoretical and empirical inquiry is warranted to deepen understanding of this evolving concept and advance nursing innovation scholarship.

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CRediT Authorship Contribution Statement

Araújo Agostinho A. C.: Writing—review and editing, writing—original draft, validation, software, project administration, methodology, investigation, formal analysis, data curation, and conceptualization. **Thomas Rachael:** Writing—review and editing, writing—original draft, visualization, validation, resources, and formal analysis. **Mikkonen Kristina:** Writing—review and editing, validation, software, resources, methodology, and conceptualization. **Bernardes Andrea:** Writing—review and editing, validation, supervision, project administration, funding acquisition, and conceptualization. **Gardim Lucas:** Writing—review and editing, writing—original draft, visualization, validation, software, resources, project administration, methodology, investigation, funding acquisition, formal analysis, data curation, and conceptualization. **Cummings Greta G.:** Writing—review and editing, validation, supervision, project administration, methodology, and conceptualization. **Tate Kaitlyn:** Writing—review and editing, validation, supervision, resources, methodology, funding acquisition, formal analysis, and conceptualization. **Wong Carol A.:** Writing—review and editing, validation, and methodology. **Sciasci Nico Gennaro:** Writing—review and editing, writing—original draft, visualization. **Nadel Hiyam:** Writing—review and editing, writing—original draft, validation. **Jeffs Lianne:** Writing—review and editing, validation, and methodology.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships that may be considered as potential competing interests: Lucas Gardim reports a relationship with SONSIEL that includes consulting or advisory and travel reimbursement. Nico Gennaro Sciasci reports a relationship with SONSIEL that includes board membership, employment, and travel reimbursement. Hiyam Nadel reports a relationship with SONSIEL that includes board membership and travel reimbursement. Lianne Jeffs reports a relationship with SONSIEL that includes board membership and travel reimbursement. Although some authors hold governance, leadership, or volunteer positions with SONSIEL: Society of Nurse Scientists, Innovators, Entrepreneurs & Leaders, these affiliations did not influence the conduct or reporting of this study. The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work, the authors used ChatGPT (OpenAI, GPT-5) to check language, grammar, and spelling. After using this tool, the authors reviewed and edited the content as needed for accuracy and originality and take full responsibility for the content of the published article.

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References

Albert, N. M. (2018). Operationalizing a nursing innovation center within a health care system. *Nursing Administration Quarterly, 42*(1), 43–53. https://doi.org/10.1097/naq.0000000000000266

Asurakkody, T. A., & Shin, S. Y. (2018). Innovative behavior in nursing context: A concept analysis. *Asian Nursing Research, 12*(4), 237–244. https://doi.org/10.1016/j.anr.2018.11.003

Atun, R., & Moore, G. (2021). *Building a High-Value Health System.* Oxford University Presshttps://doi.org/10.1093/oso/9780197528549.001.0001

Babington, L. (1993). Cautionary notes on innovation in nursing practice. *Nursing Administration Quarterly, 17*(3), 22–26.

Barr, T. L., Malloch, K., Ackerman, M. H., Raderstorf, T., & Melnyk, B. M. (2021). A blueprint for nursing innovation centers. *Nursing Outlook, 69*(6), 969–981. https://doi.org/10.1016/j.outlook.2021.05.006

Beaudet, O., Pesut, D., & Lemberger, O. (2023). The ANA Innovation Engine: Activating Innovation Through Education and Communities of Practice. *OJIN: The Online Journal of Issues in Nursing, 28*(2), https://doi.org/10.3912/OJIN.Vol28No02Man03

Benner, P., Tanner, C. A., & Chesla, C. A. (2009). *Expertise in nursing practice: Caring, clinical judgment, and ethics* (2nd ed.). Springer.

Blakeney, B., Carleton, P., McCarthy, C., & Coakley, E. (2009). Unlocking the Power of Innovation. *OJIN: The Online Journal of Issues in Nursing, 14*(2), 2009. https://doi.org/10.3912/OJIN.Vol14No02Man01

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Brenan, M. (2017). *Nursing keep healthy lead as most honest, ethical profession.* Galluphttp://news.gallup.com/poll/224639/nurses-keep-healthy-lead-honest-ethical-profession.aspx.

Cao, H., Song, Y., Wu, Y., Du, Y., He, X., Chen, Y., Wang, Q., & Yang, H. (2023). What is nursing professionalism? A concept analysis. *BMC Nursing, 22*, 34. https://doi.org/10.1186/s12912-022-01161-0

Christensen, C. M. (2011). *The Innovator's Dilemma: The Revolutionary Book That Will Change the Way You Do Business.* Harper Business.

Christensen, C. M., Hall, T., Dillon, K., & Duncan, D. S. (2016). *Competing against luck: The story of innovation and customer choice.* Harper Business.

Collins, M., & McClellan, S. (2023). Innovation leadership: Cultivating a spirit of inquiry & innovation for nurses. *The DNA Reporter, 48*(4), 10–11.

Cummings, G. (2012). Editorial: Your leadership style–how are you working to achieve a preferred future? *Journal of Clinical Nursing, 21*(23-24), 3325–3327. https://doi.org/10.1111/j.1365-2702.2012.04290.x

Davis, P. D., & Marshall, D. R. (2014). Teamwork: an essential for leading and launching innovation. *Nursing Administration Quarterly, 38*(3), 221–229. https://doi.org/10.1097/NAQ.0000000000000046

Demiris, G., Hodgson, N. A., Sefcik, J. S., Travers, J. L., McPhillips, M. V., & Naylor, M. D. (2020). High-value care for older adults with complex care needs: Leveraging nurses as innovators. *Nursing Outlook, 68*(1), 26–32. https://doi.org/10.1016/j.outlook.2019.06.019

DuBose, B. M., & Mayo, A. M. (2020). Resistance to change: A concept analysis. *Nursing Forum, 55*(4), 631–636. https://doi.org/10.1111/nuf.12479

Edmondson, A. C. (2011). *Strategies for learning from failure.* Brighton: Harvard Business Review 89 (4).

Fawcett, J. (2017). *Contemporary nursing knowledge: Analysis and evaluation of nursing models and theories* (4th ed.). F. A. Davis.

Feldman, L. B., Ruthes, R. M., & Cunha, I. C. K. O. (2008). Criatividade e inovação: competências na gestão de enfermagem. *Revista Brasileira de Enfermagem, 61*, 239–242. https://doi.org/10.1590/S0034-71672008000200015

Ferraz, P., Marques, C. S., Santos, G., Cunha, A. M., & Vaz, S. (2021). The Influence of Cognitive Styles as Promoters of Entrepreneurial Orientation and Intrapreneurship as Drivers of Innovation: The Case of Nurses in Health Services in Portugal in Times of COVID-19. *Administrative Sciences, 11*(4), 107. https://doi.org/10.3390/admsci11040107

Fuller, R., & Hansen, A. (2019). Disruption Ahead: Navigating and Leading the Future of Nursing. *Nursing Administration Quarterly, 43*(3), 212–221. https://doi.org/10.1097/NAQ.0000000000000354

Gasparino, R. C., Ribeiro, O. M. P. L., Santos, J. L. G. D., & Bernardes, A. (2024). Investing in the future of Nursing: the urgent need for sustainable and innovative work environment. *Revista Latino-Americana de Enfermagem, 32*, Article e4128. https://doi.org/10.1590/1518-8345.0000.4128

Gilmartin, M. J. (1998). The nursing organization and the transformation of health care delivery for the 21st century. *Nursing Administration Quarterly, 22*(2), 70–86. https://doi.org/10.1097/00006216-199802220-00011

Godin, B. (2006). The linear model of innovation: The historical construction of an analytical framework. *Science, Technology & Human Values, 31*(6), 639–667. https://doi.org/10.1177/0162243906291865

Holden, L. M. (2005). Complex adaptive systems: concept analysis. *Journal of Advanced Nursing, 52*(6), 651–657. https://doi.org/10.1111/j.1365-2648.2005.03638.x

Hughes, F. (2006). Nurses at the forefront of innovation. *International Nursing Review, 53*(2), 94–101. https://doi.org/10.1111/j.1466-7657.2006.00463.x

International Council of Nurses (2009). *Delivering quality, serving communities: Nurses leading care innovations (International Nurses Day 2009).* International Council of Nurses. https://www.icn.ch.

International Council of Nurses (2025). *Renewing the definitions of 'nursing' and 'a nurse.* Geneva: International Council of Nurses.

Institute of Medicine (2011). *The future of nursing: Leading change, advancing health.* National Academies Press. https://doi.org/10.17226/12956

Iuppa, M. (2022). Implementing healthcare innovations: A guide for nurses. *Nursing, 52*(7), 37–40. https://doi.org/10.1097/01.NURSE.0000832356.54051.06

Joseph, M. L., Bair, H., Williams, M., Huber, D. L., Moorhead, S., Hanrahan, K., Butcher, H., & Chi, N. C. (2019a). Health care innovations across practice and academia: A theoretical framework. *Nursing Outlook, 67*(5), 596–604. https://doi.org/10.1016/j.outlook.2019.05.007

Joseph, M. L., Huber, D. L., Bair, H., Moorhead, S., & Hanrahan, K. (2019b). A Typology of Innovations in Nursing. *The Journal of Nursing Administration, 49*(7-8), 389–395. https://doi.org/10.1097/NNA.0000000000000773

Kagan, O., Littlejohn, J., Nadel, H., & Leary, M. (2021). Evolution of Nurse-Led Hackathons, Incubators, and Accelerators from an Innovation Ecosystem Perspective. *OJIN: The Online Journal of Issues in Nursing, 26*(3), https://doi.org/10.3912/OJIN.Vol26No03Man03

Kaya, N., Turan, N., & Aydin, G. O. (2015). A concept analysis of innovation in nursing. *Procedia - Social and Behavioral Sciences, 195*, 1674–1678. https://doi.org/10.1016/j.sbspro.2015.06.244

Koppel, P. D., & Sullivan, S. D. (2022). Design Thinking like a Nurse: A Professional Practice Model for Nursing Innovation. *Creative Nursing, 28*(4), 240–246. https://doi.org/10.1891/cn-2022-0008

Koszalinski, R. S., Kagan, O., Littlejohn, J., & Nadel, H. (2021). Nurses as Content Experts, Mentors, and Judges at Collaborative Innovation Sprints. *OJIN: The Online Journal of Issues in Nursing, 26*(3).

Laihonen, H. (2012). Knowledge structures of a health ecosystem. *Journal of Health Organization and Management, 26*(4-5), 542–558. https://doi.org/10.1108/14777261211251571

Machon, M., Cundy, D., & Case, H. (2019). Innovation In nursing leadership: A skill that can be learned. *Nursing Administration Quarterly, 43*(3), 267–273. https://doi.org/10.1097/NAQ.0000000000000361

Manion, J. (1993). Chaos or transformation? Managing innovation. *The Journal of Nursing Administration, 23*(5), 41–48.

McSherry, R., & Douglas, M. (2011). Innovation in nursing practice: a means to tackling the global challenges facing nurses, midwives and nurse leaders and managers in the future. *Journal of Nursing Management, 19*(2), 165–169. https://doi.org/10.1111/j.1365-2834.2011.01241.x

Meleis, A. I. (2010). *Transitions theory: Middle-range and situation-specific theories in nursing research and practice.* Springer Publishing Company.

Metreau, E., Young, K. E., & Eapen, S. G. (2024). *World Bank country classifications by income level for 2024-2025.* , July 1. World Bank Blogshttps://blogs.worldbank.org/en/opendata/world-bank-country-classifications-by-income-level-for-2024-2025 , July 1.

Noles, K., Barber, R., James, D., & Wingo, N. (2019). Driving Innovation in Health Care: Clinical Nurse Leader Role. *Journal of Nursing Care Quality, 34*(4), 307–311. https://doi.org/10.1097/NCQ.0000000000000394

Notarnicola, I., Petrucci, C., De Jesus Barbosa, M. R., Giorgi, F., Stievano, A., Rocco, G., & Lancia, L. (2017). Complex adaptive systems and their relevance for nursing: An evolutionary concept analysis. *International Journal of Nursing Practice, 23*(3), Article e12522. https://doi.org/10.1111/ijn.12522

Nursing (2009). *Delivering quality, serving communities: nurses leading care innovations.* Nursing Update.

O'Hara, S., Ackerman, M. H., Raderstorf, T., Kilbridge, J. F., & Melnyk, B. M. (2022). Building and sustaining a culture of innovation in nursing academics, research, policy, and practice: outcomes of the National Innovation Summit. *Journal of Professional Nursing, 43*, 5–11. https://doi.org/10.1016/j.profnurs.2022.08.001

Omachonu, V. K. (2010). Innovation in Healthcare Delivery Systems: A Conceptual Framework. *The Innovation Journal, 15*, 1–12.

Orellano, M., & Gourc, D. (2025). What typology of risks and methods for risk management in innovation projects?: A systematic literature review. *International Journal of Innovation Studies, 9*(1), 1–15. https://doi.org/10.1016/j.ijis.2024.10.001

Page, M. J., Mckenzie, J. E., Bossuyt, P. M., Bouvy, M. L., Sampson, M., Trento, K. M., Moher, D., Petticrew, M., Whiting, P., Balandran, A., Stewart, L. A., Lanoë, A. M., Mulrow, C. D., Shamseer, L., Tugwell, P., Chandler, J., Li, T., Welch, V. A., Kirkham, J. J., Mccool, R., Mcdaid, C., Thomas, J., Hutton, B., Jones, M. L., Pages, D. H., Green, S., Lillie, E. M., Hoffmann, T. C., Tunçalp, Ö., Abrams, R., Chirico, G. M., Flemyng, E., Kollias, V., Murad, M. H., Stovold, E., Lepage, S. J., Nouwen, A., Rehbock, U., Strawn, L. M., Chang, Y., Ellis, S., Hunter, K. E., & Higgins, J. P. T. (2021). PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. *BMJ, 372*. https://doi.org/10.1136/bmj.n160

Palumbo, R., Cosimato, S., & Tommasetti, A. (2017). Dream or reality? A recipe for sustainable and innovative health care ecosystems. *The TQM Journal, 29*(6), 847–862. https://doi.org/10.1108/TQM-02-2017-0023

Plsek, P. E., & Greenhalgh, T. (2001). The challenge of complexity in health care. *BMJ, 323*(7313), 625–628. https://doi.org/10.1136/bmj.323.7313.625

Porter-O'Grady, T. (2003). Innovation and creativity in a new age for health care. *The Journal of the New York State Nurses' Association, 34*(2), 4–8.

Price, B. (2006). Strategies to explore innovation in nursing practice. *Nursing Standard, 21*(9), 48–58. https://doi.org/10.7748/ns2006.11.21.9.48.c6410

Raderstorf, T., Bisognano, M., & Trinter, K. (2022). How to leverage innovation models to achieve health equity: Build. Measure. Share. *Nursing Outlook, 70*(6), S88–S95. https://doi.org/10.1016/j.outlook.2022.05.009

Reeves, S., Lewin, S., Espin, S., & Zwarenstein, M. (2017). Comparing interprofessional and interorganizational collaboration in healthcare: A systematic review of the qualitative research. *International Journal of Nursing Studies, 79*, 70–83. https://doi.org/10.1016/j.ijnurstu.2017.01.011

Risjord, M. (2010). *Standpoint epistemology and nursing knowledge. Nursing knowledge: Science, practice, and philosophy (Chap. 6).* Wiley-Blackwellhttps://doi.org/10.1002/9781444315516.ch6

Rodgers, B., & Knafl, K. A. (2000). *Concept development in nursing: foundations, techniques, and applications* (2nd ed). W.B. Saunders.
Rogers, E. M. (1962). *Diffusion of Innovations.* Free Press.
Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). Free Press.
Rylee, T. L., & Cvanagh, S. J. (2023). Innovation in Nursing Practice: A Scoping Review. *Advances in Nursing Science, 46*(4), E115–E131. https://doi.org/10.1097/ANS.0000000000000464
Schumpeter, J. A. (1911). *The Theory of Economic Development.* Harvard University Press.
Senge, P. M. (1990). *The fifth discipline: The art and practice of the learning organization.* Doubleday.
Shiparski, L., & Authier, P. (2013). Mentoring frontline managers: the vital force in stimulating innovation at the point of care. *Nursing Administration Quarterly, 37*(1), 28–36. https://doi.org/10.1097/NAQ.0b013e31827514d2
Snide, J., & Nailon, R. (2013). Nursing staff innovations result in improved patient satisfaction. *The American Journal of Nursing, 113*(10), 42–50. https://doi.org/10.1097/01.NAJ.0000435349.68781.77
Snyder-Halpern, R. (1996). Health care system innovation: a model for practice. *Advanced Practice Nursing Quarterly, 1*(4), 12–19.
Stout, L., Stephens, M., & Hashmi, F. (2023). Nursing Innovation, from Process to Product: A Scoping Review. *Nursing Forum, v. 2023*, Article 6643031. https://doi.org/10.1155/2023/6643031
Thomas, T. W., Seifert, P. C., & Joyner, J. C. (2016). Registered Nurses Leading Innovative Changes. *Online Journal of Issues in Nursing, 21*(3), 3. https://doi.org/10.3912/OJIN.Vol21No03Man03
Tross, G., & Cavanagh, J. S. (1996). Innovation in nursing management: professional, management and methodological considerations. *Journal of Nursing Management, 4*(3), 143–149.
Tsai, H. M., Liou, S. R., Hsiao, Y. C., & Cheng, C. Y. (2013). The relationship of individual characteristics, perceived worksite support and perceived creativity to clinical nurses' innovative outcome. *Journal of Clinical Nursing, 22*(17-18), 2648–2657. https://doi.org/10.1111/jocn.12269
Udod, S. (2023). A call for urgent action: innovations for nurse retention in addressing the nursing shortage. *Nursing Reports, 13*(1), 145–147. https://doi.org/10.3390/nursrep13010015
Weatherford, B., Bower, K. A., & Vitello-Cicciu, J. (2018). The CNO and Leading Innovation: Competencies for the Future. *Nursing Administration Quarterly, 42*(1), 76–82. https://doi.org/10.1097/NAQ.0000000000000263
Weberg, D. (2009). Innovation in healthcare: A concept analysis. *Nursing Administration Quarterly, 33*(3), 227–237. https://doi.org/10.1097/NAQ.0b013e3181accaf5
Weng, R. H., Chen, W. P., Huang, C. Y., Hung, C. H., & Hsu, C. T. (2016). Can nurse innovation improve customer perception of service quality and experience? 2016 *Journal of Clinical Nursing, 25*(13-14), 1950–1961. https://doi.org/10.1111/jocn.13214
Weng, R. H., Huang, C. Y., & Lin, T. E. (2013). Exploring the cross-level impact of market orientation on nursing innovation in hospitals. 2013 *Health Care Management Review, 38*(2), 125–136. https://doi.org/10.1097/HMR.0b013e31824b1c84
Weng, Rhay-Hung, Huang, Ching-Yuan, Huang, Jin-An, & Wang, Man-His (2012). The cross-level impact of patient safety climate on nursing innovation: a cross-sectional questionnaire survey. *Journal of Clinical Nursing, 21*(15-16), 2262–2274. https://doi.org/10.1111/j.1365-2702.2012.04170.x
Weston, M. J. (2009). Managing and facilitating innovation and nurse satisfaction. *Nursing Administration Quarterly, 33*(4), 329–334. https://doi.org/10.1097/NAQ.0b013e3181b9dd7e
White, K. R., & Begun, J. W. (1996). Profession building in the new health care system. *Essential Readings in Nursing Managed Care, 20*(3), 79–85. https://doi.org/10.1097/00006216-199602030-00012
White, K. R., Pillay, R., & Huang, X. (2016). Nurse leaders and the innovation competence gap. *Nursing Outlook, 64*(3), 255–261. https://doi.org/10.1016/j.outlook.2015.12.007
Williams, L., & McMurray, A. J. (2003). Factors affecting the innovative practice of nurse managers in health organisations. *Contemporary Nurse, 16*(1-2), 30–39. https://doi.org/10.5172/conu.16.1-2.30
World Health Organization (2023). *Global call to action for health innovation scale-up by the public sector.* Geneva: World Health Organization.
World Health Organization (2020). *State of the world's nursing 2020: investing in education, jobs and leadership.* Geneva: World Health Organization.
World Health Organization (2025). *State of the world's nursing report 2025: investing in education, jobs and leadership.* Geneva: World Health Organization.
Yan, D., Li, M., Zhang, Y., & Zhang, Y. (2022). A qualitative study of facilitators and barriers to nurses' innovation at work. *Journal of Nursing Management, 30*(7), 3449–3456. https://doi.org/10.1111/jonm.13811
Zuber, C., & Weberg, D. (2020). Frameworks for Leading Frontline Innovation in Health Care: Failure, Microclimates, and Leadership. *Nurse Leader, 18*(3), 290–295. https://doi.org/10.1016/j.mnl.2020.03.005
Zuber, C. D., & Moody, L. (2018). Creativity and Innovation in Health Care: Tapping Into Organizational Enablers Through Human-Centered Design. *Nursing Administration Quarterly, 42*(1), 62–75. https://doi.org/10.1097/NAQ.0000000000000267