Evidence-based leadership in nursing: An evolutionary concept analysis

Abstract

Aim(s): To conduct a concept analysis of evidence-based leadership in a nursing context.

Methods: Rodgers' evolutionary method was employed to identify attributes, antecedents, consequences, definitions and surrogate and related terms.

Data Source: We systematically searched three databases (PubMed, Cumulative Index to Nursing and Allied Health Literature and Scopus) for relevant publications. The databases were searched from their inception to 4 February 2024.

Results: We included 12 papers published between 2005 and 2022. The attributes include leadership attributes (personality, developing common goals and visions and influencing others) and evidence-based attributes (valuing evidence-based practice, integrating evidence and adapting evidence). The antecedents include individual internal factors (commitment to growth and proficiency in implementation science) and individual external factors (growing need for evidence-based practice, training support and available resources), while the consequences are personal growth, organizational benefit and disciplinary development. Based on the concept analysis, evidence-based leadership can be defined as a process whereby individuals, based on their personality and values toward evidence-based practices, integrate the best evidence into practice, adapt the evidence integration process based on evaluations, and influence others towards achieving a common goal and vision.

Conclusions: This concept analysis enhances our understanding of evidence-based leadership, guiding nurses to integrate evidence into their leadership practices to achieve specific goals and visions within the healthcare context. Future studies could consider developing instruments to evaluate evidence-based leadership based on this refined concept, ultimately promoting nurses' leadership competencies in real-world settings.

Implication for nursing practice: This concept analysis not only raises awareness of the responsibilities of nurses as healthcare professionals, including the provision of evidence-based practice, but also facilitates their effective execution of these responsibilities. Empowering nurses to actively incorporate evidence into their leadership practices can further enhance the quality of healthcare delivery.

Reporting Method: Not applicable.

Patient or Public Contribution: Not applicable.

Keywords

concept analysis; evidence-based leadership; evidence-based practice; leadership; nursing

What already is known

- A lack of an evidence base in leadership practice may result in poor clinical judgment, outdated delivery and/or ineffective care.
- Evidence-based leadership offers a solution for how nurses can use evidence to inform their leadership practice.
- Despite the benefits associated with evidence-based leadership, there remains a lack of understanding about this concept, potentially undermining its effectiveness in healthcare settings.

What this paper adds

- This study provides an understanding of evidence-based leadership as a concept within the nursing context, analysing its attributes, antecedents, consequences, definitions, surrogate terms and related terms.
- Based on the analysis, an operational definition of evidence-based leadership is provided in this study.

- This concept analysis presents a conceptual model that elucidates how evidence-based leadership can be enhanced and implemented for nurses in clinical settings and within the nursing discipline.

Implications for practice/policy

- A clear definition of evidence-based leadership identified in this study can be used to raise awareness of nurses' responsibilities in implementing evidence-based practice as healthcare professionals.
- The attributes of evidence-based leadership identified in this study help highlight the importance of incorporating patients' views into nursing practice.
- The conceptual model of evidence-based leadership aids in designing targeted training programs for nurses, enhancing the use of evidence in nursing practice and ultimately improving the quality of care.

1 INTRODUCTION

Healthcare systems globally are encountering intricate and multifaceted challenges in delivering high-quality and cost-effective care (World Health Organization, 2021). The growing complexity of patients' conditions, the pressures faced by nurses and the rising costs of healthcare are the main challenges, that require attention and resolution (World Health Organization, 2020). In this context, leadership is an important skill for nurses; it enables them to effectively navigate the complex and constantly changing healthcare system, address challenges and make informed decisions (Stanley et al., 2022). However, when implementing leadership in practice, nurses often rely on their intuition or personal views (Hallo & Nguyen, 2022). Although these intuitive insights can be valuable in certain situations, they may not always align with evidence-based approaches or the intricate demands of healthcare organizations (Hallo & Nguyen, 2022), which may further result in poor clinical judgment, outdated delivery and/or ineffective care (Dobber et al., 2023).

Evidence-based leadership offers a solution for how nurses can use evidence to inform their leadership practice (Melnyk & Tim Raderstorf, 2024). Evidence-based leadership was initially proposed by Jumaa and Alleyne (1998) as a process that incorporates evidence into leadership practice by evaluating and integrating management and leadership frameworks and concepts into clinical practice and decision-making. However, the concept of evidence-based leadership has also been applied in the context of developing leadership using an evidence-based approach (Gauly et al., 2023). The inconsistent meanings of evidence-based leadership may lead to confusion in its interpretation and implementation, potentially undermining its effectiveness in healthcare settings (Bringmann et al., 2022). Therefore, a clear definition of the concept of evidence-based leadership is needed to promote consistent

use across studies and ensure its proper application in clinical practice within nursing and other fields (Melnyk et al., 2022).

1.1 Background

We systematically searched PubMed for previously published literature until 17 March 2024 using the keywords ‘evidence-based’ and ‘leadership’ and found 115 papers. Nine papers of these 115 focused especially on evidence-based leadership. Of these, eight papers (Alleyne & Jumaa, 2007; Duffy et al., 2011; Eddy et al., 2009; Gallagher-Ford, 2014; Nayback-Beebe et al., 2013; Nicklin & Stipich, 2005; Pipe et al., 2008; Porter-O’Grady & Malloch, 2008) were conducted within the nursing domain and one (Bleich & Brown, 2019) was in the library field. Seven papers were case studies, one used a qualitative study design, and one was expert opinion. Of the seven case studies, three (Alleyne & Jumaa, 2007; Duffy et al., 2011; Nicklin & Stipich, 2005) described the impact of evidence-based leadership training programmes. However, no systematic reviews or concept analyses of evidence-based leadership were found. One reason for this gap in knowledge may be the ambiguity of the concept (Abelsson et al., 2022). Therefore, a concept analysis was conducted in this study to gain a better understanding of the concept of evidence-based leadership.

Concept analysis is a method used to define or clarify a concept by identifying its components and related elements (Rodgers et al., 2018). In this study, we applied Rodgers’ (2000) evolutionary concept analysis. Through this approach, we aim to provide a comprehensive understanding of evidence-based leadership for its application in a specific domain (Paley, 2021). This analysis could be served as a benchmark for illustrating how evidence-based leadership is conceptualised in nursing. It may also offer opportunities for future research and pathways to develop

interventions aimed at enhancing evidence-based leadership among nurses, enabling them to better navigate the complexities of healthcare settings.

2 METHODS

2.1 Rodger's evolutionary concept analysis method

In this study, Rodger's (2000) evolutionary concept analysis method was used. This scholarly process was selected because it aims to develop a concept and establish potential meanings of a phenomenon as presented in the existing literature (Hupcey & Penrod, 2005; Meleis, 2011). The process entails systematic formulation and elucidation of constructs to facilitate evaluation, clarification and further development (Meleis, 2011). This method aligned with our study's purpose, which was to synthesize existing literature in a nursing context to analyse evidence-based leadership as a concept.

According to Rodgers (2000), the evolutionary concept analysis method has six main steps (Table 1). These steps guided the conduct and reporting of the concept analysis.

TABLE 1 Six-step method of Rodgers' evolutionary concept analysis

No.	Steps
1	Identify a concept
2	Determine the scope (setting and sample) of data collection
3	Collect data to identify the attributes and context of the concept
4	Analyse and summarise the data
5	Identify an example of the concept
6	Identify implications for future concept development

2.2 Eligibility criteria

Inclusion criteria for the papers were as follows: 1) Papers that described the term evidence-based leadership within the nursing context, 2) Papers had the potential to address the attributes, antecedents, consequences, definitions, surrogate terms and related terms of evidence-based leadership and 3) Papers were peer-reviewed publications. Exclusion criteria: Letters to the editor were excluded.

2.3 Information sources

The data used in this concept analysis were obtained from three databases (PubMed, Cumulative Index to Nursing and Allied Health Literature and Scopus), which were selected due to their widespread usage (Page et al., 2021).

2.4 Search strategy

The databases were searched from their inception to 4 February 2024 by SH. Since 'evidence-based leadership' is not a subject term in any of the selected databases, the terms 'evidence-based' and 'leadership' were combined using Boolean logic operators within the title/abstract in each database (see Supplementary File, Table 1 for the search strategies and results in each database). No language restriction was applied.

2.5 Selection process

The search results were imported into Covidence (Veritas Health Innovation, 2023), a web-based collaboration software platform that streamlines the production of systematic and other literature reviews. We used it to remove duplicates and screen

papers. Three researchers (SH, SL and XL) independently screened the remaining papers according to the eligibility criteria. First, titles and abstracts were screened for eligibility, and another researcher (WC) resolved any screening conflicts. Second, the same researchers (SH, SL and XL) retrieved and screened the full text of the eligible papers. Any conflicts during the process were resolved by (WC). In this phase, 11 papers were included, and their reference lists were screened to find any additional studies; 2 additional papers were identified. However, one paper could not be retrieved despite contacting both the first and the corresponding authors, which left us with only one additional paper. Finally, 12 papers were included in the concept analysis.

2.6 Data collection

A data collection tool was developed by SH using Microsoft Excel (version 2019). This tool was used to collect the following information. First, two authors (JL, JH) independently extracted the study characteristics from all eligible papers, including the first author, year, country, journal domain, aim, design and setting. Second, six components of our concept (i.e., attributes, antecedents, consequences, definitions, surrogate terms and related terms) were determined according to Rodgers' (2000) method. Two authors (JL, JH) independently extracted these components. Table 2 provides more detailed definitions of the evidence-based leadership components.

TABLE 2 Description of the components of evidence-based leadership based on Rodgers' (2000) analysis method

Component	Description
Attribute	Characteristics of evidence-based leadership as a concept.

Antecedent	The events, phenomena or factors that occur before evidence-based leadership takes place in a practical situation.
Consequence	The events, phenomena or factors that occur after evidence-based leadership takes place in a practical situation.
Definition	A statement or description that clarifies the meaning or nature of evidence-based leadership.
Surrogate term	A term expresses the ideas of evidence-based leadership using different words, while still encompassing all the attributes of evidence-based leadership.
Related term	A word that has something in common with the concept of evidence-based leadership yet does not possess the same characteristics.

2.7 Synthesis methods

A content analysis method (Hsieh & Shannon, 2005) was employed to analyse and synthesise the data. The content analysis involves the subjective interpretation of textual data through a systematic classification process of coding and identifying themes or patterns (Hsieh & Shannon, 2005). It entails establishing initial coding based on theory or prior research before analysing the data. Based on the content analysis method, our data analysis and synthesis method included the following steps:

1) Six themes were identified and analysed based on Rodgers' (2000) analysis method: attributes, antecedents, consequences, definitions, surrogate terms and related terms of evidence-based leadership.

2) SH started the analysis with a comprehensive reading of the text under each theme. She extracted the text describing these themes from the eligible papers and organised them into a data extraction table (See Supplementary File, Table 2 for the data extraction table and eligibility criteria for the data analysis). In terms of the definition, five papers reported definitions of evidence-based leadership. These

definitions were moved into a table for further comparison with the attributes identified in our study, to determine whether a new definition was needed (See Supplementary File, Table 2 for the data extraction table and eligibility criteria for the data analysis) (Ansong & Gazarian, 2024).

3) The text under each of the five themes (attributes, antecedents, consequences, surrogate terms, and related terms) was coded according to the definition of the theme (See Table 2) (Dal Pizzol et al., 2024). For example, one study mentioned, "the NA (nurse administrator) earnestly role-modeled evidence-based decision making in her own practice." We assigned the code "acting as a role model of evidence-based decision making".

4) Each code was compared with the others to identify possible similarities or differences. If similarities were found between the codes, they were highlighted with the same color and grouped into sub-categories, each of which was assigned a name. For example, since the codes "evidence search" and "evidence critique" were components of the evidence integration process (Schmidt & Brown, 2024), these two codes were combined into a sub-category named "evidence integration."

4) Each sub-category was further compared with the other sub-categories to identify possible similarities or differences, and similar sub-categories were combined into categories with appropriate names. For example, since the sub-categories "valuing evidence-based practice" and "evidence integration" belong to evidence-based attributes (Schmidt & Brown, 2024), these two codes were combined into a category named "evidence-based attributes."

5) A researcher (XL), who was not involved in the coding and categorization process, reviewed each code, sub-category and category to confirm the validity of the analytical process and the final results. If any discrepancies arose during the analysis, the coding and categorization processes were repeated until both researchers (SH and XL) agreed on the analysis results. For example, the code "Reconsidering original

goals" was initially categorized by SH under "Developing common goals and visions". However, XL believed it should fall under "Adapting evidence", as the code referred to reconsidering original goals based on the evaluation of the change implementation outcomes, which aligns with the definition of adapting evidence (see "3.3.2.3 Adapting evidence"). In contrast, "Developing common goals and visions" pertains to the period before the change implementation. The two researchers revisited the text and discussed it further to gain a deeper understanding of the context. After that, they reached a consensus to place the code under "Adapting evidence".

An example of the data analysis and synthesis process can be found in Supplementary File, Figure 1.

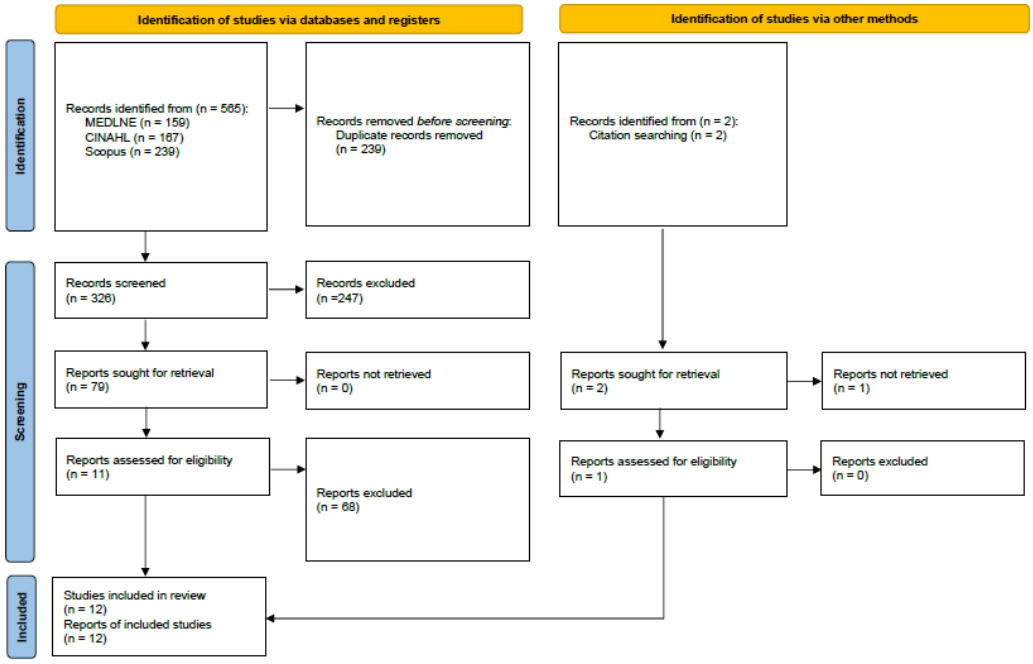


FIGURE 1 Search strategy PRISMA flowchart (Page, McKenzie, and Brennan 2021).

Following the synthesis process, a new definition of evidence-based leadership was developed because none of the identified definitions in the included papers fully encompassed all the attributes of evidence-based leadership. To enhance the

comprehension of evidence-based leadership, related terms were clarified. Additionally, to provide a practical demonstration of the concept used in a clinical setting, we formulated a model case integrating all the attributes identified in the analysed papers (Rodgers et al., 2000).

3 RESULTS

3.1 Search results

A total of 565 documents were retrieved. After removing 239 duplicates, the titles and abstracts of the remaining papers were screened. After excluding non-eligible papers, 79 full-text papers were obtained, and 12 papers were included in the final analysis. Figure 1 presents the search and screening processes in a flowchart (Page et al., 2021).

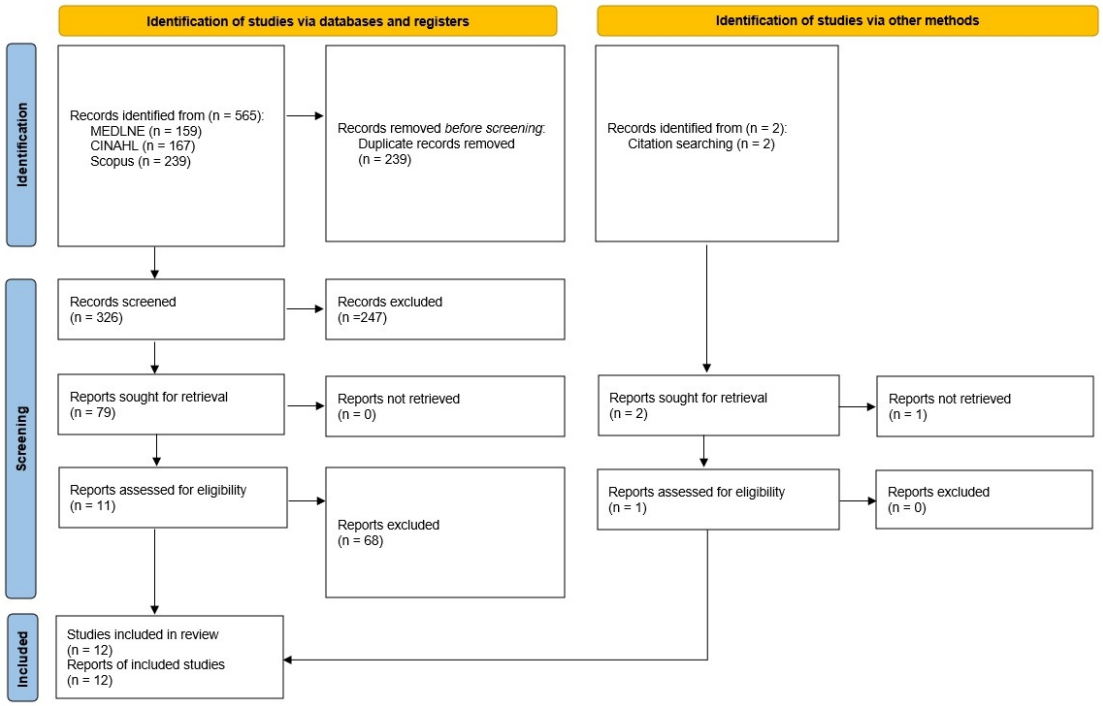


FIGURE 1 Search strategy PRISMA flowchart (Page et al., 2021).

3.2 Characteristics of the included papers

Out of the12 included papers, 10 were published in nursing journals and 2 in interdisciplinary health journals. The papers were published between 2005 and 2022. In most publications (n = 7), the first author was from the US (Alleyne & Jumaa, 2007; Duffy et al., 2011; Eddy et al., 2009; Joseph et al., 2022; Nayback-Beebe et al., 2013; Pipe et al., 2008; Porter-O'Grady & Malloch, 2008), while the remaining authors were from Finland (n = 2) (Kvist et al., 2014; Välimäki et al., 2021), the United Kingdom (n = 1) (De Groot, 2005), Colombia (n = 1) (Gallagher-Ford, 2014), and Canada (n = 1) (Nicklin & Stipich, 2005).

Regarding the types of the papers, seven were case studies (Alleyne & Jumaa, 2007; Duffy et al., 2011; Gallagher-Ford, 2014; Nayback-Beebe et al., 2013; Nicklin & Stipich, 2005; Pipe et al., 2008; Porter-O'Grady & Malloch, 2008), one was a literature review (De Groot, 2005), one was a systematic review protocol (Välimäki et al., 2021), one was a qualitative study (Eddy et al., 2009), one was a longitudinal descriptive intervention study (Kvist et al., 2014) and one was a Delphi-type descriptive survey (Joseph et al., 2022).

In terms of the settings, five empirical papers were conducted in diverse healthcare settings (e.g., hospitals and communities) (Eddy et al., 2009; Gallagher-Ford, 2014; Joseph et al., 2022; Kvist et al., 2014; Nicklin & Stipich, 2005), three in hospitals (Duffy et al., 2011; Nayback-Beebe et al., 2013; Pipe et al., 2008) and one in the community (Alleyne & Jumaa, 2007) (see Supplementary File, Table 3). In three papers, reporting the research settings was not applicable

3.3 Attributes

In this study, six attributes of evidence-based leadership were uncovered and further categorized into two groups: leadership attributes and evidence-based attributes.

3.3.1 Leadership attributes

Three leadership attributes that supported effective evidence-based leadership practice were categorized based on 11 papers (Alleyne & Jumaa, 2007; De Groot, 2005; Duffy et al., 2011; Eddy et al., 2009; Gallagher-Ford, 2014; Kvist et al., 2014; Nayback-Beebe et al., 2013; Nicklin & Stipich, 2005; Pipe et al., 2008; Porter-O'Grady & Malloch, 2008; Välimäki et al., 2021): personality, developing common goals and visions and influencing others.

3.3.1.1 Personality

Personality refers to the unique combination of characteristics that define an individual's thoughts, emotions, and behaviours, influencing their effective engagement and interaction with others, often characterized by attractiveness, charisma, and influence (Cervone & Pervin, 2022). Three personality traits in evidence-based leadership were identified in five papers: self-confidence, self-reflection and creativity (Alleyne & Jumaa, 2007; De Groot, 2005; Gallagher-Ford, 2014; Kvist et al., 2014; Porter-O'Grady & Malloch, 2008). *Self-confidence* was described in the included study as the leader's confidence in performing evidence-based leadership practices (Alleyne & Jumaa, 2007). *Self-reflection* was depicted as taking time to read and contemplate the specific assets and legacy a leader owes (De Groot, 2005; Kvist et al., 2014). *Creativity* was linked to the innovative redistribution of allocated resources and the expansion of personal experience through the creation,

generation, application and evaluation of knowledge (Gallagher-Ford, 2014; Porter-O'Grady & Malloch, 2008).

3.3.1.2 Developing common goals and visions

This attribute involves creating compelling visions for the future and effectively translating them into common goals and actionable strategies based on evidence during evidence-based leadership practice (American Nurses Association, 2018). Seven papers identified it as a key attribute of evidence-based leadership (Alleyne & Jumaa, 2007; Eddy et al., 2009; Gallagher-Ford, 2014; Kvist et al., 2014; Nayback-Beebe et al., 2013; Porter-O'Grady & Malloch, 2008; Välimäki et al., 2021). Multiple elements were described in the included studies: identifying and analysing leadership issues (Alleyne & Jumaa, 2007; Nayback-Beebe et al., 2013; Välimäki et al., 2021), developing common goals (Alleyne & Jumaa, 2007; Gallagher-Ford, 2014), formulating solutions to issues (Alleyne & Jumaa, 2007), clarifying roles for the specific goals (Alleyne & Jumaa, 2007), challenging outdated evidence (Alleyne & Jumaa, 2007), reaching consensus on clear working processes (Alleyne & Jumaa, 2007), implementing continuous quality service (Alleyne & Jumaa, 2007), achieving common goals (Alleyne & Jumaa, 2007; Kvist et al., 2014), making strategic decisions (Eddy et al., 2009; Nayback-Beebe et al., 2013), articulating the vision for change (Gallagher-Ford, 2014), openly inviting ideas for structuring the change process ahead (Gallagher-Ford, 2014), managing subterfuges toward the change (Gallagher-Ford, 2014; Porter-O'Grady & Malloch, 2008).

3.3.1.3 Influencing others

Influencing others involves to persuading, inspiring, and motivating others to adopt a particular perspective or take specific actions (Arbinger Institute, 2008) during

evidence-based leadership practice (Gallagher-Ford, 2014). This attribute was identified in 10 papers as a component of evidence-based leadership (Alleyne & Jumaa, 2007; De Groot, 2005; Duffy et al., 2011; Gallagher-Ford, 2014; Kvist et al., 2014; Nayback-Beebe et al., 2013; Nicklin & Stipich, 2005; Pipe et al., 2008; Porter-O'Grady & Malloch, 2008; Välimäki et al., 2021). Eight components related to influencing others were identified: building an open relationship with stakeholders (Alleyne & Jumaa, 2007; Duffy et al., 2011; Gallagher-Ford, 2014; Kvist et al., 2014; Pipe et al., 2008; Porter-O'Grady & Malloch, 2008), listening and allowing for group silence to gather thoughts (Duffy et al., 2011), recognising and rewarding hard work and successes (Gallagher-Ford, 2014; Nayback-Beebe et al., 2013), consulting experts to determine the most effective changes (Gallagher-Ford, 2014), consistently communicating with others about what has been learned and how it could be applied (De Groot, 2005), staffing appropriately when implementing changes (Nayback-Beebe et al., 2013), forming a team with stakeholders (Nayback-Beebe et al., 2013; Välimäki et al., 2021), fostering collaboration with others (e.g., other leaders) (Duffy et al., 2011; Kvist et al., 2014; Nayback-Beebe et al., 2013; Nicklin & Stipich, 2005).

3.3.2 Evidence-based attributes

Three attributes (i.e., valuing evidence-based practice, integrating evidence and adapting evidence) were identified to describe evidence-based attributes based on 10 papers (De Groot, 2005; Duffy et al., 2011; Eddy et al., 2009; Gallagher-Ford, 2014; Kvist et al., 2014; Nayback-Beebe et al., 2013; Nicklin & Stipich, 2005; Pipe et al., 2008; Porter-O'Grady & Malloch, 2008; Välimäki et al., 2021).

3.3.2.1 Valuing evidence-based practice

Valuing evidence-based practice can be understood as the deep recognition and commitment of individuals to the principles of evidence-based practice (Kvist et al., 2014; Tomkins & Bristow, 2023). It was described in six papers to characterize evidence-based leadership (Eddy et al., 2009; Gallagher-Ford, 2014; Kvist et al., 2014; Nicklin & Stipich, 2005; Pipe et al., 2008; Porter-O'Grady & Malloch, 2008). It includes three aspects: understanding the importance of using evidence to guide their practice (Eddy et al., 2009; Pipe et al., 2008; Porter-O'Grady & Malloch, 2008), acting as a role model in evidence-based practice (Gallagher-Ford, 2014; Kvist et al., 2014) and prompting evidence-based practice (Kvist et al., 2014; Nicklin & Stipich, 2005).

3.3.2.2 Integrating evidence

Integrating evidence refers to the process of searching, selecting, appraising and synthesising multiple types of evidence to implement and subsequently evaluate leadership practice (Boswell & Cannon, 2022; White et al., 2024). Ten papers identified integrating evidence as an evidence-based leadership attribute (De Groot, 2005; Duffy et al., 2011; Eddy et al., 2009; Gallagher-Ford, 2014; Kvist et al., 2014; Nayback-Beebe et al., 2013; Nicklin & Stipich, 2005; Pipe et al., 2008; Porter-O'Grady & Malloch, 2008; Välimäki et al., 2021). Six key characteristics of this attribute were identified: forming a research question (e.g., a PICO question: Patient/population Intervention Comparison/Control Outcome) (Nayback-Beebe et al., 2013; Pipe et al., 2008), evidence search (Duffy et al., 2011; Nayback-Beebe et al., 2013; Nicklin & Stipich, 2005; Pipe et al., 2008; Välimäki et al., 2021), selecting evidence applicable to current leadership practice (Duffy et al., 2011; Eddy et al., 2009; Gallagher-Ford, 2014; Nayback-Beebe et al., 2013; Välimäki et al., 2021), evidence critique (Duffy et al., 2011; Eddy et al., 2009; Nayback-Beebe et al., 2013;

Nicklin & Stipich, 2005; Välimäki et al., 2021), implementing evidence-based change (Kvist et al., 2014; Nicklin & Stipich, 2005; Porter-O'Grady & Malloch, 2008) and evaluating outcomes of change implementation (De Groot, 2005; Duffy et al., 2011; Eddy et al., 2009; Nayback-Beebe et al., 2013; Porter-O'Grady & Malloch, 2008).

3.3.2.3 Adapting evidence

Adapting evidence refers to modifying the evidence integration process based on the evaluation of outcomes to better fit a specific context or situation (Morton et al., 2021), thereby facilitating a successful and sustained change. Two papers mentioned adapting evidence as one of the attributes of evidence-based leadership (De Groot, 2005; Duffy et al., 2011). They focused on refining the change based on progress evaluation (De Groot, 2005) and reconsidering the original goals (established before the change implementation) based on the evaluation outcomes (Duffy et al., 2011).

3.4 Antecedents of evidence-based leadership

The antecedents of evidence-based leadership (i.e., events, phenomena or factors that occur before evidence-based leadership takes place), were categorized into two groups based on eight papers: individual internal factors and individual external factors (Alleyne & Jumaa, 2007; De Groot, 2005; Duffy et al., 2011; Gallagher-Ford, 2014; Joseph et al., 2022; Kvist et al., 2014; Nicklin & Stipich, 2005; Pipe et al., 2008).

3.4.1 Individual internal factors

The individual internal factors included commitment to growth and proficiency in implementation science. Commitment to growth refers to the ongoing process of

continuous development and unwavering dedication to one's role as a nurse (Kunnen et al., 2024). De Groot et al. (2005) described that nurses' commitment to growth as formal nurse leaders could potentially lead to evidence-based leadership. Implementation science is "the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice to improve the quality and effectiveness of health services and care" (Eccles & Mittman, 2006). Proficiency in implementation science refers to a person's competency in applying implementation science. Joseph et al. (2022) mentioned the importance of proficiency in implementation science for evidence-based leadership.

3.4.2 Individual external factors

The individual external factors were identified based on seven papers. They included a growing need for evidence-based practice, training support, and available resources (Alleyne & Jumaa, 2007; Duffy et al., 2011; Gallagher-Ford, 2014; Joseph et al., 2022; Kvist et al., 2014; Nicklin & Stipich, 2005; Pipe et al., 2008). A growing need for evidence-based practice highlights the recognition of the importance of evidence-based practice within healthcare settings worldwide. Alleyne and Jumaa (2007) specifically emphasized that their definition of evidence-based leadership was based on the growing need for evidence-based practice. In relation to training support, four papers reported four evidence-based leadership training activities (Alleyne & Jumaa, 2007; Duffy et al., 2011; Kvist et al., 2014; Nicklin & Stipich, 2005). Exposure to evidence-based leadership activities through mentoring was associated with increased reported evidence-based leadership levels (Kvist et al., 2014; Nicklin & Stipich, 2005). Executive co-coaching and group clinical supervision also positively impacted the level of evidence-based leadership (Alleyne & Jumaa, 2007). Training activities that focus on collaboration between nurses and academic researchers/educators were described as a way to foster evidence-based leadership (Duffy et al., 2011). One paper

described available resources. Joseph et al. (2022) identified that, to develop evidence-based leadership, available resources such as access to evidence, organizational support and external funding are crucial.

3.5 Consequences of evidence-based leadership

Evidence-based leadership consequences were categorized into three groups based on seven papers: personal growth, organizational benefit and disciplinary development (Alleyne & Jumaa, 2007; De Groot, 2005; Duffy et al., 2011; Gallagher-Ford, 2014; Nayback-Beebe et al., 2013; Nicklin & Stipich, 2005; Porter-O'Grady & Malloch, 2008).

3.5.1 Personal growth

Personal growth refers to the continuous development and improvement of an individual's competencies and overall well-being (van Woerkom & Meyers, 2019). Two papers mentioned that improved evidence-based leadership could result in personal growth (Alleyne & Jumaa, 2007; Kvist et al., 2014). For example, enhanced service-providing capacity to improve the quality of services provided to their patients (Alleyne & Jumaa, 2007) and improved staff supporting skills (Kvist et al., 2014).

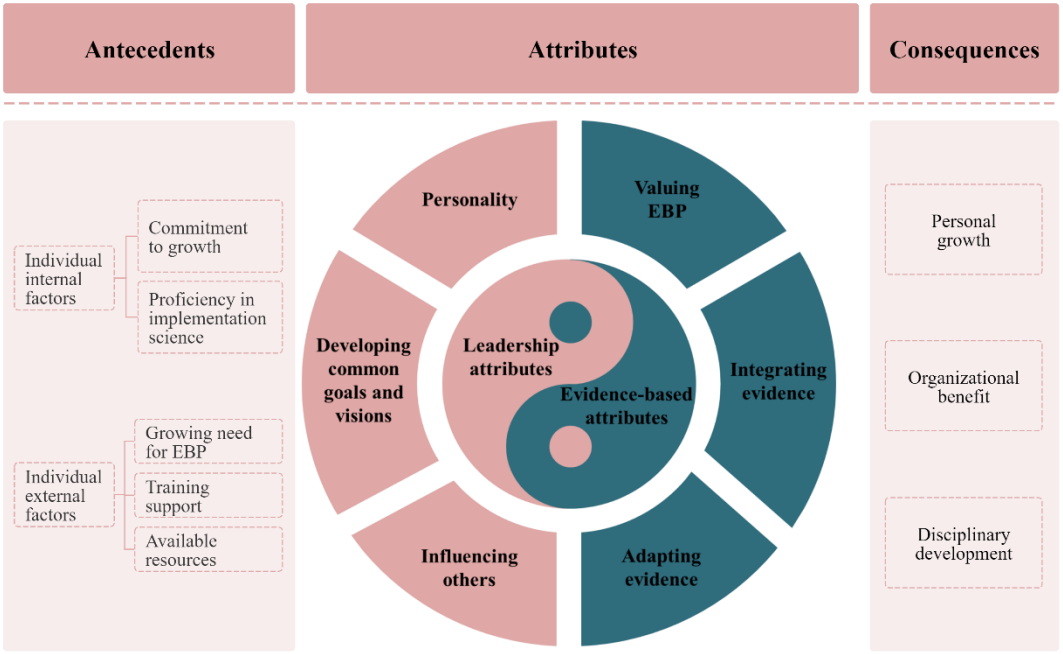
3.5.2 Organizational benefit

Organizational benefit refers to the positive outcomes or advantages that an organization gains by adopting evidence-based leadership practices (Alleyne & Jumaa, 2007). Six papers identified organizational benefits from eight aspects associated with evidence-based leadership (Alleyne & Jumaa, 2007; De Groot, 2005; Gallagher-Ford, 2014; Nayback-Beebe et al., 2013; Nicklin & Stipich, 2005; Pipe et

al., 2008): innovation-oriented work environment (Alleyne & Jumaa, 2007; Gallagher-Ford, 2014; Nayback-Beebe et al., 2013), cost-effectiveness practices (Nicklin & Stipich, 2005), patient safety (De Groot, 2005), patient satisfaction (Nayback-Beebe et al., 2013), patient outcomes and quality of care (Nayback-Beebe et al., 2013; Nicklin & Stipich, 2005; Pipe et al., 2008), relationships with followers (Gallagher-Ford, 2014; Nayback-Beebe et al., 2013), staff morale (Nayback-Beebe et al., 2013) and staff presence (Nayback-Beebe et al., 2013).

3.5.3 Disciplinary development

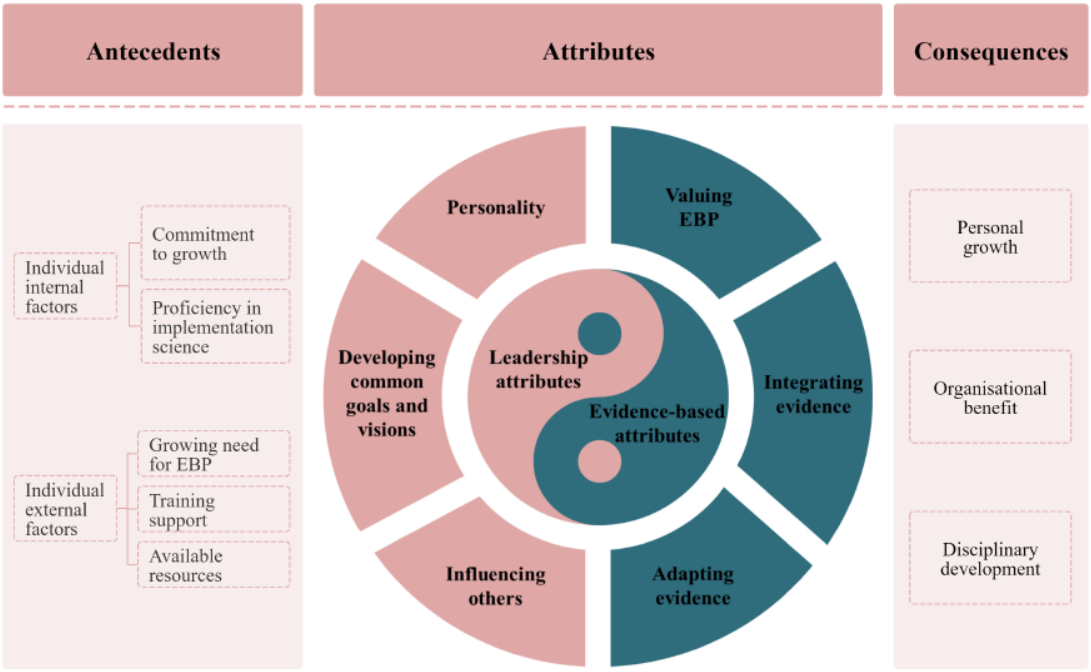
Disciplinary development refers to the continuous progress and advancement of nursing knowledge, theory and practice to foster innovation and growth in the discipline (Grace & Perry, 2013). Five papers mentioned that evidence-based leadership drives the development of the nursing discipline (Alleyne & Jumaa, 2007; Gallagher-Ford, 2014; Kvist et al., 2014; Nicklin & Stipich, 2005; Pipe et al., 2008). Three elements were described in the included studies: promoting evidence-based



practice for nursing leadership (Alleyne & Jumaa, 2007; Nicklin & Stipich, 2005; Pipe et al., 2008), improving collaboration with other health professionals (Kvist et al., 2014; Nicklin & Stipich, 2005) and gaining more respect from colleagues and experts (Gallagher-Ford, 2014).

Note: EBP: evidence-based practice.

FIGURE 2. Conceptual model of evidence-based leadership in nursing.



Based on the above concept analysis, Figure 2 presents the antecedents, attributes, and consequences of evidence-based leadership in nursing. First, antecedents include individual internal factors (commitment to growth and proficiency in implementation science) and individual external factors (growing need for evidence-based practice, training support and available resources). Second, the attributes of evidence-based leadership included leadership attributes (personality, developing common goals and visions and influencing others) and evidence-based attributes (valuing evidence-based practice, integrating evidence and adapting

evidence). Finally, the consequences were personal growth, organizational benefit and disciplinary development.

We used a Tai-Chi Diagram (Dang et al., 2024) to illustrate the relationship between two attributes. The rationale for using the Tai-Chi Diagram is grounded in insights from the included studies: 1) The two attributes complement each other; evidence relies on leadership for effective application, while the effectiveness of leadership requires a strong evidence base (Joseph et al., 2022; Kvist et al., 2014); 2) Evidence-based attributes contain elements of leadership, while leadership attributes incorporate evidence. For example, leaders must interpret evidence (a leadership skill); while leadership practice should be based on evidence (a hallmark of evidence-based thinking) (Porter-O'Grady & Malloch, 2008); 3) The Tai-Chi Diagram emphasizes wholeness, while these two attributes together form a complete skill set for leaders and should be viewed as an integrated whole (Nicklin & Stipich, 2005).

3.6 Definition of evidence-based leadership in nursing

In five papers, different definitions of evidence-based leadership were given (Alleyne & Jumaa, 2007; De Groot, 2005; Duffy et al., 2011; Kvist et al., 2014; Välimäki et al., 2021), which are summarised in Table 3.

TABLE 3 Definitions of Evidence-based Leadership

Author(s) year	Definition
Alleyne 2007 (Jumaa & Alleyne 1998)	'A process whereby clinical nurses and midwives critically appraise, and incorporate tried and tested management and leadership frameworks and concepts into clinical practice, and

	decision-making, in order to improve the quality of patient care.'
De Groot 2005	'A transformational relationship involving organizational stewardship, decision-making, and vision translation through reasoned application of empirical evidence from management, leadership, and patient care research.'
Duffy 2011	'The systematic application of the best available evidence to the evaluation of managerial strategies for improving the performance of health services in organizations.'
Välimäki 2021	'The process of when a person attempts to influence the behaviour of individuals or a group in an organization using an evidence-based approach, for any reason.'
Kvist 2014	'The best use of evidence to organize, guide, deliver, finance and improve the quality of care and patient safety.'

However, no existing definition encompasses all the attributes of evidence-based leadership identified in this study. We therefore developed a new definition of evidence-based leadership based on the attributes identified from the included papers, as follows:

"Evidence-based leadership can be defined as a process whereby individuals, based on their personality and values toward evidence-based practices, integrate the best evidence into practice, adapt the evidence integration process based on evaluations, and influence others towards achieving a common goal and vision."

3.7 Surrogate terms

Two different surrogate terms were used to describe evidence-based leadership in the nursing context: evidence-based administration (Nicklin & Stipich, 2005) and transformational evidence-based leadership (Gallagher-Ford, 2014). Evidence-based

administration was used interchangeably with evidence-based leadership in one paper (Nicklin & Stipich, 2005) to emphasize the importance of evidence in decision-making during leadership practice. One paper used transformational evidence-based leadership to highlight the fact that evidence-based leadership is a sub-component of transformational leadership (Gallagher-Ford, 2014).

3.8 Related terms

Four concepts related to evidence-based leadership were identified: evidence-based management, evidence-based decision-making, transformational leadership, and implementation leadership (De Groot, 2005; Duffy et al., 2011; Gallagher-Ford, 2014; Joseph et al., 2022; Välimäki et al., 2021). Evidence-based management is defined as the systematic application of the best available evidence to inform managerial strategies for improving the performance of health services organizations (Walshe & Rundall, 2001). It focuses on applying evidence-based principles and practices to various management functions. Evidence-based leadership, on the other hand, pertains specifically to leadership practice and behaviours (Alleyne & Jumaa, 2007; De Groot, 2005).

Evidence-based decision-making is an approach that highlights using the best available evidence to inform and guide decision-making processes (Barends & Rousseau, 2018). It focuses on the evidence-based decision-making process rather than leadership practices and behaviours (De Groot, 2005). Gifford et al. (2017) define implementation leadership as "a multidimensional process of influence that enables clinical staff to use evidence in their clinical decision-making and includes activities and behaviours of unit-level managers and supervisors that influence staff, their environment and organizational factors that influence implementation". It

underscores the role of formal leaders in supporting staff in implementing evidence-based decision-making or practices (Gifford et al., 2017; Shuman et al., 2018), while evidence-based leadership emphasizes the use of evidence by all nurses, regardless of their formal organizational positions, to support their leadership practices. Finally, evidence-based leadership was viewed as a sub-component of transformational leadership because the leader needs to make and execute a transformative action plan for introducing and implementing evidence-based changes within a complex clinical setting (Gallagher-Ford, 2014).

3.9 Model case

None of the included studies fully encompassed all the attributes that constitute the components of evidence-based leadership, as identified in our analysis. Therefore, a model case derived from the first author's experience is presented in the next paragraph. It depicts how a registered nurse (RN) develops their evidence-based leadership competency by considering the precedent factors and conducts nursing reform by leading a group of healthcare professionals towards a common goal. This whole process leads to personal, organizational and disciplinary benefits.

Kimber, a 24-year-old RN, has been working in the obstetrics ward for four years. She believes in the importance of evidence-based practice in clinical nursing and strives to integrate it into the department's work culture **(valuing evidence-based practice)**. Her department has increasingly emphasized the use of evidence in nursing practice, and she has started to learn about systematic methods for applying evidence in clinical practice **(Growing need for evidence-based practice and proficiency in implementation science)**. To further her professional development, Kimber uses the electronic library **(available resources)** to support her participation in a training

programme **(training support)** focused on evidence-based practice and leadership development **(commitment to growth)**. One day, Kimber noticed that postpartum women often experienced severe breast pain due to milk engorgement. She communicated with the head nurse and three colleagues about how significant this issue was, and motivated them all to work together to address this issue **(developing common goals and visions)**. This vision inspired everyone. They all began to search for current evidence on breast pumping. By carefully reviewing and selecting the relevant evidence, they developed a preliminary intervention for postpartum women regarding breast pumping. They documented this plan and arranged a meeting, inviting the stakeholders (including postpartum women, fellow frontline nurses, nurse managers, and doctors) to gather their insights and recommendations on the specific implementation details. After considering their input, the team made the necessary adjustments to finalize the intervention. They started to implement the intervention in their department since then, recorded changes in the degree of breast engorgement using the Visual Analogue Scale (Heller et al., 2016) after the implementation and then compared it with the previous month's data. The findings revealed a decrease in the degree of breast engorgement among the women they cared for after implementing the intervention **(integrating evidence and influencing others)**. Kimber assessed and adjusted the implementation process of the intervention through participant interviews to improve patient adherence and the effectiveness of the intervention **(adapting evidence)**. The postpartum women's satisfaction with their nursing care increased, and the nurse turnover rate decreased **(organizational benefit)**. Through self-reflection **(personality)**, Kimber discovered they had gained more knowledge and skills related to evidence-based practice **(personal growth)**. As a result, Kimber's colleagues and leaders showed Kimber increased respect. Furthermore, the doctors in the department start to value the nurses' innovative and independent contributions **(disciplinary development)**.

4. DISCUSSION

The purpose of this paper was to analyse evidence-based leadership and provide an understanding of its meaning in nursing contexts using Rodgers' (2000) evolutionary method. The five attributes identified in this concept analysis (i.e. developing common goals and visions, influencing others, valuing evidence-based practice, integrating evidence and adapting evidence), align well with the previous evidence-based literature (Abu-Baker et al., 2021; Flemming et al., 2018; Specchia et al., 2021). However, our analysis highlights an additional attribute in implementing evidence-based leadership practice in nursing: leaders' personality. The role of personality is well established in leadership theories like Charismatic Leadership (Swan, 2022) and Destructive Leadership (Magwenzi, 2018). Effective use of evidence at all levels of nursing is essential (International Council of Nurses, 2021), and nurses often leverage their personality or charisma to influence others in evidence-based leadership (Kvist et al., 2014). However, we need to be cautious as charismatic leaders can be both constructive or destructive (Magwenzi, 2018). Therefore, further research is needed to help nurses identify which personality traits enhance evidence-based leadership effectiveness and which traits may undermine it.

As antecedents, we found two main categories to describe the events, phenomena or factors that occur before evidence-based leadership takes place (i.e. individual internal factors and individual external factors). In the existing literature, external factors, such as training support (Koota et al., 2021), and available resources, such as time (McArthur et al., 2021), are described as necessary to support the realization of evidence-based practice. However, the literature less often describes the meaning of individual internal factors as antecedents for evidence-based practice or evidence-

based leadership. We found that internal factors, such as commitment to growth as a nurse and proficiency in implementation science, were crucial precursors to the emergence of evidence-based leadership. According to Self-Determine Theory (Deci et al., 2017), individuals who demonstrate a strong commitment to their professional roles typically exhibit higher levels of responsibility in their work. Thus, a nurse's commitment to growth may drive them to fulfill their responsibilities, including delivering evidence-based leadership in care (International Council of Nurses, 2021; Lartey et al., 2023). Conducting evidence-based leadership practices is complex due to the numerous and interrelated contextual factors (e.g., organisational culture, resource availability) that must be taken into account (American Associate of Colleges of Nursing, 2021). Proficiency in implementation science is important for evidence-based leadership as it allows nurse leaders to leverage the theoretical frameworks and associated research methods to understand and test determinants (including contextual factors) of adoption, implementation, and sustainability of evidence-based leadership practice (Nelson-Brantley & Chipps, 2021). Thus, our finding is important as it offers a more comprehensive recognition of the antecedents of evidence-based leadership in the nursing context, and provides insight into how evidence-based leadership can be enhanced for nurses in clinical settings.

We also identified three categories of consequences illustrating the events, phenomena or factors following evidence-based leadership: personal growth, organizational benefit and disciplinary development. While personal growth and organizational benefits have been extensively addressed in prior evidence-based practice studies (Chiwaula et al., 2018; Schaefer & Welton, 2018), disciplinary development has received less attention and measurement in previous research. This could be attributed to two reasons. First, compared to personal growth and organizational benefit, professional development is typically more complicated and lacks relevant evaluation

tools (Ryan & McAllister, 2021). Second, in healthcare settings, individuals may prioritize personal growth (i.e. self-confidence) and organizational benefits (i.e. quality of care or turnover rate of staff) over professional development (Price & Reichert, 2017). It is noteworthy that disciplinary development is also less frequently mentioned in some leadership theories and evidence-based practice models, such as Transformational Leadership Theory (Northouse, 2021) and the Ottawa Model of Implementation Leadership (Gifford et al., 2017). However, the Knowledge-to-Action Framework highlights that the outcomes of evidence-based change can be considered from the perspectives of not only individuals and organisations but also the broader health system (Graham & Tetroe, 2010). Our findings contribute to existing theories by providing an important aspect of disciplinary development related to the evaluation of outcomes in the implementation of evidence-based leadership practice.

The findings from this concept analysis reveal that evidence-based leadership is a complex term. A new definition of evidence-based leadership was developed, as none of the identified definitions fully incorporated the attributes of evidence-based leadership synthesized in our study. The proposed definition builds upon the attributes identified in the included papers to extend and update the previous definitions of evidence-based leadership. Leadership and evidence-based practice play an increasingly important role in the current healthcare setting, with growing recognition of their interaction in addressing the complexities of the evolving healthcare system (World Health Organization, 2022). The updated meaning of evidence-based leadership in our study points out and emphasises a bidirectional partnership of leadership attributes and evidence-based attributes, promoting the integration and development of both fields.

4.1 Limitations

Our concept analysis has several limitations that need to be considered. First, this concept analysis focused on nursing and did not analyse the concept of evidence-based leadership in other healthcare disciplines, which limits the generalizability of the findings to other disciplines. Second, although the literature search was conducted systematically using commonly utilized databases, it is possible that some relevant references were missed, especially if they were published in journals not indexed in the databases searched. Third, the search did not consider grey literature, which may have resulted in missing relevant articles. Fourth, due to the time-consuming nature of concept analyses, new findings may have emerged. We searched all ongoing reviews related to evidence-based leadership in PROSPERO and found only one systematic review focusing on the measured and perceived impacts of evidence-based leadership in nursing (Välimäki, 2021). Therefore, the landscape of the evidence-based leadership literature may not change in the near future.

4.2 Implications for future theory development

Despite these limitations, our study had significant implications for future theoretical development. The concept identified in this study adds new evidence to the scientific understanding of evidence-based leadership as a concept, effectively addressing existing conceptual ambiguities in the nursing field. It serves as a common reference point for the development and application of evidence-based leadership in nursing practices. Moreover, the conceptual model offers opportunities and information for expanding theories and integrating them with other relevant fields, fostering knowledge exchange and collaboration. For instance, the intersection of evidence-based leadership with theories from organizational behaviour could be explored to

gain a more comprehensive understanding of how evidence-based leadership impacts organizational culture and patient outcomes.

4.3 Implications for future research

To further enrich this conceptual model, it is essential to conduct studies aimed at developing instruments for evaluating evidence-based leadership, its factors and the consequences identified in this study. Subsequent observational studies could then be undertaken to investigate the intricate relationships among the concepts outlined in the conceptual model. These efforts will deepen our understanding of evidence-based leadership and its practical implications, ultimately strengthening the applicability of this model in real-world settings.

4.4 Implications for nursing

According to the International Council of Nurses (2021), one of the key professional responsibilities of nurses is to provide evidence-based practice, especially evidence-based leadership practice. Creating a consensus on the conceptual foundations of evidence-based leadership will not only raise awareness of the responsibilities of nurses as healthcare professionals but also empower them to actively engage in evidence-based leadership practice. For instance, nurses can seek and utilize data to inform their decision-making processes by collecting and analyzing patient outcomes, and leveraging feedback to refine their leadership strategies. Moreover, nurses can stay updated by reviewing the latest relevant evidence from publications ensuring their practices align with current evidence-based guidelines. Collaborating with other healthcare professionals to develop evidence-based protocols for patients is another way to implement evidence-based leadership practice. Looking ahead, nurses can establish mentorship initiatives, where experienced nurse leaders mentor less

experienced colleagues during their evidence-based leadership practices. This fosters the sharing of best practices and cultivates a culture of evidence-based leadership within healthcare teams.

For healthcare organizations, the conceptual model clearly outlines how to enhance evidence-based leadership among nurses, as it identifies the influencing factors of evidence-based leadership. Designing and implementing training programmes that target these influencing factors will significantly improve the effectiveness of the training. The concept model defines the attributes of evidence-based leadership, which can help determine the training content and evaluation criteria. Additionally, various resources, such as funding and access to databases, are critically important in supporting the development of evidence-based leadership. In addition to verbal commitments to promote the development of evidence-based leadership among nurses, organizations can take substantive actions, and a crucial aspect of this is providing various essential resources to support nurses in implementing evidence-based leadership.

For the nursing discipline, both the International Council of Nurses (2020) and the World Health Organization (2020) have outlined goals to promote the leadership and influence of nurses in the healthcare field. This study contributes to these efforts by providing valuable insights toward achieving these goals. Clarifying evidence-based leadership as a concept facilitates its improvement, which can further enhance the leadership and influence of nurses in the healthcare field. In turn, this leads to greater recognition of nurses' value and an enhancement of their social status.

5. CONCLUSION

The concept of evidence-based leadership in nursing was defined by analysing its attributes, antecedents, and consequences using Rodgers' concept analysis method. This comprehensive analysis of evidence-based practice enhances our understanding of how nurses can effectively apply it in healthcare settings. Future studies could consider developing instruments to evaluate evidence-based leadership based on this refined concept, ultimately promoting nurses' leadership competencies in real-world settings.

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Supplementary File

TABLE 1 Search strategies and results used in each database

Databases	Searches	Results	Type
Medline (EbscoHost)	TI=(evidence-based N2 leadership) OR AB=(evidence-based N2 leadership)	159	Advanced
CINAHL	(TI evidence-based N2 leadership) AND (AB evidence-based N2 leadership)	167	Advanced
Scopus	TITLE-ABS-KEY (evidence-based W/2 leadership)	239	Advanced

Notes. TI = title. AB = abstract. TITLE-ABS-KEY = title, abstract, and keywords.