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RESEARCH LEADERSHIP IN HEALTHCARE SETTINGS: A CONVERSATIONAL SEARCH ENGINE-AIDED CONCEPT ANALYSIS

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Abstract

Research leadership in health care settings is increasingly recognized as a pivotal factor influencing institutional effectiveness, innovation, and development. However, the way people perceive and respond to this concept is unclear mainly because of the difficulties in merging the various definitions that have developed across different fields, especially in healthcare settings. Hence, it is vital to clarify the meaning of "research leadership" and formulate its defining attributes, antecedents, consequences, and practical applications. Using the eight-stage concept analysis framework by Walker and Avant (2019) along with a conversational search engine that uses Large Language Models (LLMs) Perplexity AI, a robust tool for its real- time web search capabilities and ability to provide comprehensive answers, "research leadership" was explored. A thorough literature search was completed covering peer-reviewed, full-text, and English-language publications from the last decade (2014–2025) from four online sources- EBSCOhost and PubMed databases; via Google Scholar search engine; and the Mendeley article access as well as three English dictionaries. After applying the eligibility criteria, a total of 24 articles were reviewed, and analyzed after until saturation was reached. The review revealed key characteristics that emphasized the most frequently used terms associated with the concept. Following Walker and Avant's methodology (2014; 2019), five defining attributes emerged as significant themes: *1. Strategic Vision and System Improvement; 2. Contextual Adaptation and Implementation; 3. Collaborative and Relational Leadership; 4. Workforce Support and Development; 5. Knowledge Translation and Evidence- Based Practice*. Meanwhile, three antecedents included: 1. *Core research competencies and skills; 2. Supportive Environment; and 3. Adaptive and Ethical Leadership Styles*. Meanwhile, four consequences were: 1. *Performance Improvement; 2. Stakeholder Success; 3. Adaptable Frameworks; and 4. Knowledge Translation*. Lastly, a clearer definition was identified as the ability to empower individuals to spearhead research initiatives that demonstrably improve healthcare delivery and patient outcomes. This leadership is characterized by a strategic vision for system-wide enhancements, a commitment to sustained operational support for effective interventions, collaborative practices that foster team cohesion and engagement, targeted workforce training to develop research capacity, and effective knowledge translation to integrate evidence-based practices into clinical settings.

Keywords: research leadership, healthcare settings, concept analysis, theory development, synthesis

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Research Highlights

What is the current knowledge?

- Research leadership plays a crucial role in institutional effectiveness, innovation, and development globally and locally.
- Healthcare settings require adaptive leadership strategies to improve performance and patient outcomes.
- Despite various definitions, research leadership lacks a comprehensive concept analysis.

What is new in this study?

- This study fills a gap by examining the concept of research leadership.
- In healthcare settings, professionals often have varied interpretations of what research leadership entails.
- The study offers valuable insights into the definitions, attributes, antecedents, and consequences of research leadership, which can aid in navigating the evolving healthcare environment.
- Moving forward, definitions of research leadership should be comprehensive, incorporating a broad perspective on delivering high-quality healthcare services.

INTRODUCTION

The current healthcare landscape demands effective leadership which it is increasingly recognized as a vital element of institutional efficacy, innovation, and development in a variety of contexts. Healthcare organizations including public and private are concerned about how clients should be satisfied with the services and how these are assessed in order to achieve strategic goals. Notably, research leadership is one aspect that can potentially enhance healthcare service delivery and patient outcomes. Effective leadership in hospital administration is vital for shaping organizational culture, boosting employee engagement, and elevating the quality of patient care in healthcare facilities (Aini & Dzakiyullah, 2024). With the current challenges confronting every organization, it is essential to reassess research leadership roles and practices as well as how they operate within healthcare settings particularly hospitals.

Globally, it is evident that adaptive and responsive kinds of research leadership must be emphasized. Aside from the healthcare administrators, policymakers now prioritize research leadership in order to solve important issues such as changing patient needs, financial limitations, and increased accountability demands (Baker et al., 2015). As such, leaders must therefore retain institutional integrity while responding to the expectations of many stakeholders (Miller & Nadler, 2020), including the patients/ clients as well as those who produce research. Ruben (2019) noted that leadership is a widely discussed topic that garners interest in many areas, including healthcare. Furthermore, Saltsman and Shelton (2019) pointed out that when training leaders in global education, the essential leadership skills continue to be important, and that global leadership competencies are often seen as more crucial than those related to domestic leadership or even those focused on management education. Likewise in health care with the necessity for leaders to develop competencies, they must address global trends while remaining in line with local circumstances.

Cleary, du Toit, Scott and Gilson (2017) believed that excellent management and leadership competencies are critical in enhancing health system performance.

A synthesis by Heinen, van Oostveen, Petes, Vermeulen, and Huis (2019) emphasizes the key competencies needed in clinical, professional, health systems, and health policy leadership. In this regard, healthcare administrators must evaluate their own practices related to research leadership. This global setting asserts the importance of integrating cultural understanding into leadership strategies, as effective research leadership entails both leveraging individual capabilities and creating collaborative conditions that foster creativity (Watermeyer et al., 2021). Further, the development of medical leadership competencies for healthcare reforms is increasingly recognized, and of course, this must also cover research. Frameworks like the CanMEDS model, first published in 1996 and updated in 2005, have gained global recognition for highlighting key competencies such as medical expertise, communication, collaboration, leadership, health advocacy, and scholarship, all designed to enhance the capabilities of healthcare leaders (Baker et al., 2015). Moreover, new ideas have surfaced, including equity, diversity, inclusion, and social justice; anti-racism; physician humanism; data-informed medicine; complex adaptive systems; clinical learning environments; virtual care; clinical reasoning; adaptive expertise; and planetary health (Thoma et al., 2023). As a result, transforming healthcare organizations to improve performance requires effective strategies to engage physicians and promote medical leadership (Baker & Denis, 2011). These skills are even essential for research leadership and make evidence-based practice (EBP) approaches to making decisions and taking actions in clinical settings easier. Further, they can help create innovative collaborative cultures, and guarantee that the healthcare service provided is in line with the most recent best available scientific evidence.

Others also showed that hospitals are increasingly realizing the importance of strong leadership in overcoming challenges such as staff morale, resource allocation, and patient care quality (Cummings et al., 2022). Leadership is crucial for creating high-quality work environments, introducing innovative care models, and supporting the health and well-being of a nursing workforce that is facing considerable challenges (Cummings et al., 2018). Additionally, various leadership philosophies are examined that encourage collaboration, creativity, and adaptability to improve organizational performance (Alharbi et al., 2022). Research shows that transformational leadership (TFL) impacts the work environment of nurses through factors like structural empowerment, organizational commitment, and job satisfaction. The perception among nurses that managerial TFL behaviors do not meet high standards underscores the need for more leadership training focused on enhancing patient safety culture and moving away from a blame-oriented mindset in nursing environments (Ystaas, Nikitara, Ghobrial, Latzourakis, Polychronis & Constantinou, 2023). Moreover, effective hospital governance should include balancing mechanisms and controls to steer the decision-making process, requiring a thorough framework to comprehend the components of governance and their influence on hospital performance (De Regge & Eeckloo, 2020).

A strong emphasis on research leadership skills is vital for creating an inquiry-driven culture that encourages healthcare professionals, such as physicians and nurses, to engage actively in evidence-based practices. Research shows that nurse leaders can have a significant impact on future hospital leadership by focusing on digitalization, fostering a hybrid work environment, creating sustainable working conditions, easing the transition to a post-pandemic world, breaking down traditional organizational structures, and adopting flexible leadership styles (Vuorivirta-Vuoti, Kuha & Kanste, 2023). Additionally, it has been shown that incorporating digital technology and remote leadership strategies is essential for improving teamwork and communication within healthcare teams (Dirani

et al., 2020). Shared leadership models in hospitals also promote interdisciplinary collaboration, with various approaches identified, including spontaneous collaboration, intuitive working relationships, and established practices. While shared leadership can have both positive and negative effects on team performance, the results associated with it are significant (Janssens, Simon, Beckmann & Marshall, 2021).

Consequently, this undertaking may improve understanding of how research leadership can adapt to the changing healthcare landscape worldwide using Walker and Avant's method (2014; 2019). This context of research leadership within hospital settings is complex, requiring a nuanced understanding of global trends, national challenges, and local dynamics. Thus, a concept analysis is necessary to identify the research leadership attributes, antecedents, and consequences providing a structured framework that can inform theories, policy, practice and future research. Additionally, this study utilizes the conversational search engine, Perplexity AI, which employs large language models (LLMs) and is relatively uncommon, to assist in the analysis. The objective is to demonstrate its effectiveness in elucidating the meaning of the concept under investigation.

Finally, using Walker and Avant's (2019) eight-stage concept analysis framework and a conversational search engine that makes use LLMs, this analysis aims to synthesize the vast amount of literature gathered from different disciplines in order to formulate defining characteristics, antecedents, and consequences of research leadership within healthcare settings. The concept of research leadership must be defined in a way that makes it possible for patients/clients, researchers, medical and allied health professionals, healthcare administrators, and policymakers to clearly communicate with one another and define clear lines of responsibility.

MATERIALS AND METHODS

This concept analysis, aided by a conversational search engine that uses LLMs- Perplexity AI, was using Walker and Avant's eight-step approach (Walker & Avant, 2014; 2019). This AI tool was chosen for its emphasis on web search capabilities and its proficiency in summarizing the content related to the analyzed concept. The conversational search engine that uses LLMs Perplexity AI was used to refine the search queries and access relevant literature efficiently. The tool enabled the author to navigate complex databases using natural language, enhancing the precision of search results as well as aiding in the analysis in line with the approach. Meanwhile, this approach is clear and systematic and is considered to be the most common for concept analysis in healthcare settings (Nuopponen, 2010). This includes the following steps:

- Step 1. Selecting a concept for analysis;
- Step 2. Determining the purpose of the analysis;
- Step 3. Identifying all uses (definitions) of the concept;
- Step 4. Determining the defining attributes of the concept;
- Step 5. Constructing a model case;
- Step 6. Constructing borderline, related and contrary cases;
- Step 7. Identifying the antecedents and consequences of the concept; and
- Step 8. Defining the empirical referents of the concept.

Step 1: Selecting a Concept for Analysis

The first step of this analysis is selecting the concept of research leadership in healthcare settings for further examination. The conversational search engine that uses LLMs Perplexity AI was also prompted to provide the reason for this selection, highlighting the importance of research leadership:

> Effective research leadership is essential for improving patient outcomes and increasing the effectiveness of healthcare delivery systems. Healthcare executives are change agents who recognize systemic problems and put creative solutions in place. They are more than just administrators. Leaders need to have a thorough awareness of organizational dynamics, clinical procedures, and regulatory frameworks in order to successfully navigate the complexity of contemporary healthcare. For instance, they are essential as principal investigators, supervising studies that convert scientific findings into useful applications that help patients achieve better health outcomes (*Perplexity*, 2025).

With these, the importance of leadership in healthcare is highlighted by various journals and publications. For instance, Leadership in Health Services cited international examples of theory and best practices to enhance healthcare practices, organizations, and services (Emerald Publishing, n.d.). Similarly, Health Services Management Research offers expert information on all aspects of healthcare management, analyzing policy initiatives and healthcare systems worldwide (Sage Journals, n.d.). These resources highlight how important strong leadership is in tackling the problems that healthcare systems face.

In this step, it has been demonstrated that performance improvement and adherence to guidelines positively link with the efficacy of leadership interventions in healthcare settings (MDPI, 2023). The importance of research leaders in fostering an environment of inquiry and ongoing development is only going to grow as healthcare systems place a greater emphasis on evidence-based procedures. In order to spur innovation and improve the standard of patient care, leaders must be able to motivate and inspire their teams toward shared objectives.

Steps 2: Determining the Purpose of the Analysis

In the second step, this concept was selected for analysis because there are ambiguities surrounding the concept of research leadership. The purpose of this analysis was to clarify and further develop the concept and propose a clearer definition within a healthcare context by health professionals. The conversational search engine that uses LLMs- Perplexity AI also shared the same view on the purpose of this concept analysis, following Walker and Avant's approach (2014; 2019).

Data Sources and Search Strategy

Towards the third step, a broad literature search for the term "research leadership" was undertaken in four online sources (EBSCOhost and National Library of Medicine-PubMed Databases; Google Scholar search engine and Mendeley article access) as well as Oxford, Merriam-Webster and Collins English dictionaries. A university librarian who is a specialist helped in the development of the strategies for the initial and final search. This search included peer-reviewed published articles from January 2014 to December 2025. Further, to refine the search process and capture pertinent literature,

the terms, “research leadership”, “research management”, “research administration” and “research supervision” AND “healthcare” OR “health care” were included in the process which generated 5,698 hits. Keywords were truncated where appropriate.

Subsequently, all identified records were organized using Mendeley, a reference management tool, to generate the necessary RIS document for the Cadima free web tool to facilitate systematic reviews, systematic maps, and other literature reviews. The records were then imported into the Cadima version 2.2.4.2 web tool (updated April 2023) for screening and duplicate removal purposes.

Table 1

Electronic Search Strategies

Sources	Search Strategies
EBSCOhost	("research leadership" OR "research management" OR "research administration" OR "research supervision") AND ("healthcare" OR "health care")
PubMed	(((((Research Leadership[Title/Abstract]) OR (Research Management[Title/Abstract])) OR (Research Administration[Title/Abstract])) OR (Research supervision[Title/Abstract])) AND (healthcare[Title/Abstract])) OR (health care[Title/Abstract])
Google Scholar	("research leadership" OR "research management" OR "research administration" OR "research supervision") AND ("healthcare" OR "health care")
Mendeley Article Access	Research Leadership OR Management OR Administration OR Supervision in Healthcare Settings

With the aid of a free conversational search engine that uses LLMs- Perplexity AI, the author independently filtered articles according to preset eligibility criteria. Full-text versions of possibly pertinent papers were obtained after the initial screening of titles and abstracts. The author worked with the conversational search engine that uses LLMs to settle any conflicts that arose throughout the screening phase.

Eligibility Criteria

The eligibility criteria for the literature and studies in this analysis were defined initially using the Population, Concept and Context (PCC) Framework (Aromataris & Munn, 2020). Population and Outcomes (PO) framework was then employed via the free webtool Cadima. This framework clearly identifies the population and specifies the outcomes that helps guide the development of clear and meaningful objectives and inclusion criteria by focusing on the key elements of participants and the outcome measures. In like manner, with the aid of the conversational search engine that uses LLMs-Perplexity AI, these were screened for relevance to the established criteria with a cut-off percentage set by the author.

Table 2.

Eligibility Criteria

Eligibility	Participants	Concept	Context	Article Type
Inclusion	Studies on health care professionals who serve as research Managers/Heads/ Leaders/ Administrators	Publications that define or clarify the concept of research leadership/ management/ administration/ supervision within healthcare settings.	Studies conducted in healthcare settings globally, including hospitals, clinics, and research institutions.	Empirical Studies
Exclusion	Studies specifically not addressing healthcare professionals or research leadership roles	Studies that do not address the concept of research leadership or are not relevant to healthcare settings.	Studies not conducted within healthcare settings or not relevant to the global context of healthcare.	Reviews, Editorials Commentaries, Book Reviews, Anecdotal Papers Without References

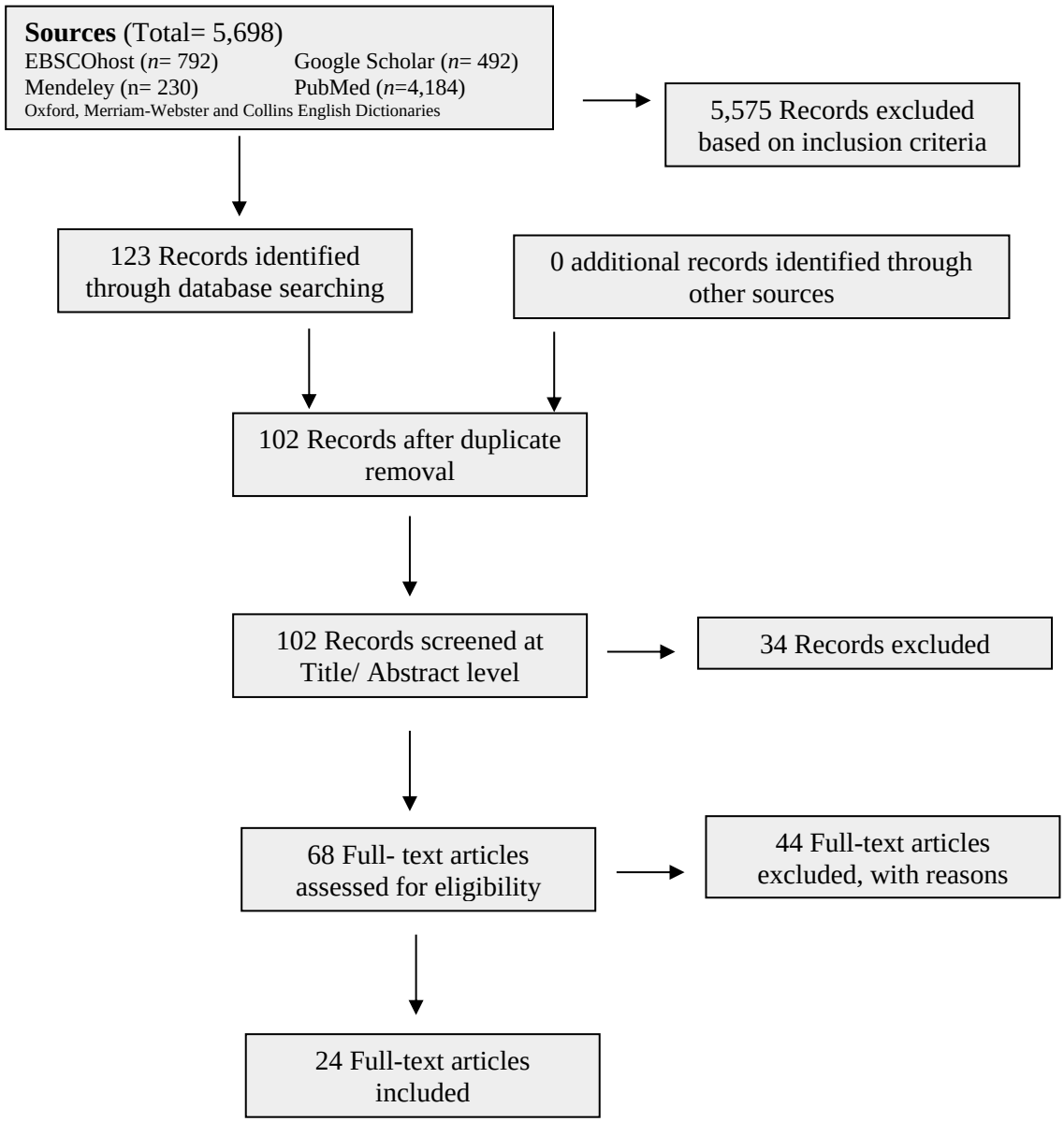
This study considered empirical studies that focused on positional healthcare leaders, including physicians, allied health workers, and non-allied health workers who serve as research leaders. To be eligible for inclusion, publications had to either define, describe or clarify the concept of leadership within the relevant healthcare context. This approach is in line with systematic evaluations in healthcare leadership that stress the need for empirical data in comprehending how leadership development affects healthcare outcomes (e.g., BMJ Leader, 2021). In healthcare settings, where different leadership styles and competencies are essential for efficient organizational performance and patient care, the participation of varied healthcare professionals indicates the wider scope of leadership (e.g., Scientific Research Publishing, 2021).

The inclusion criteria were designed to ensure relevance to research leadership, thoroughly examining its different facets or its relationship to important concepts found in full-text publications and academic journals. On the other hand, the exclusion criteria included limited text publications, articles that could not be assessed, non-academic works, and non-empirical studies that did not address the key terms.

After the search was narrowed down by applying the exclusion criteria to the title/ keywords, abstract and full text, a final total of 24 articles were found for review. Each article was carefully analyzed using the Walker and Avant approach, and with the help of a conversational search engine that uses LLMs Perplexity AI, a data extraction table was created using Cadima 2023 software. Key findings from every area of literature were methodically examined. The identification of key themes and thematic mapping were made by the documentation, organization, and cross-category comparison of significant points.

Figure 1

Flow Diagram Depicting the Study Selection Process using Cadima.



Note. This figure demonstrates the flow diagram depicting the study selection process from the four online sources (EBSCOhost, Google Scholar, Mendeley and National Library of Medicine PubMed). From the 37 full-text articles excluded, the reasons were: Not related to population (*n*=150); full-text not available (*n*= 8); full text not assessable (*n*=1); no primary data/ summary statistics presented (*n*= 13); and redundant entries in the critical appraisal in Cadima (*n*= 7).

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The review showed representation from a variety of health care contexts, including primary, entrepreneurial, hospital, community health, and academic institutions, as well as the larger health systems and services. England, Indonesia, Iran, Ireland, Pakistan, Rwanda, Saudi Arabia, South Africa, Uganda, the United States, and Vietnam were among the nations from which articles were recovered. The essential terms used in each of the final 24 papers, together with variables and important themes related to research leadership, were recorded in a data extraction Excel spreadsheet. The search and screening results are presented in a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram (Figure 1).

Figure 2

Wordle denoting key terms from the literature associated with research leadership.

In addition, a Wordle (Figure 2) was produced via Wordle.net, a free online tool that generated "word clouds" from the documented keywords and phrases relating to the concept of research leadership. This contributed to the crafting of the attributes as a basis for the antecedents. Once there were no new themes generated from the literature sources, saturation was considered.

RESULTS

In this concept analysis, results are presented as the uses of the concept, attributes, cases (model, borderline, related and contrary), antecedents, consequences, and empirical referents of research leadership. In each of these steps, the conversational search engine that uses LLMs Perplexity AI results are also integrated.

Step 3: Identify Uses (Definitions) for the Concept in Health Care Settings

The concept of research leadership is a combination of two concepts: research and leadership.

Initially, the conversational search engine that uses LLMs Perplexity AI was prompted to search for the definitions of the terms: “research”, “leadership” and “research leadership” across online dictionaries. It provided that the term "research" has several meanings, but as a noun, research refers to "a systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions" (Oxford English Dictionary, n.d.). This definition aligns with the concept of research as a careful and detailed study aimed to discover new information or understanding a subject. It is also a careful study of a subject, especially in order at discovering new facts or information about it. As a verb, to research means "to carry out a systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions" (Oxford English Dictionary, n.d.). Merriam-Webster's dictionary defines research (noun) as studious inquiry or examination especially an investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new or revised theories or laws. It is also a careful search for knowledge. As a verb, it refers to searching or examining with continued care or to seek diligently. Lastly, in Collins English Dictionary (n.d.), "research" is defined as “the diligent and systematic inquiry or investigation into a subject in order to discover or revise facts, theories, applications among others”.

Meanwhile, the Oxford Dictionary defines leadership as the “action of leading a group of people or an organization" and "the state or position of being a leader" (Oxford Dictionary, n.d.). Merriam-Webster's dictionary defines leadership as "the office or position of a leader, the capacity to lead, and the act or instance of leading" (Merriam-Webster, 2007). While Collins Dictionary (n.d.) describes it as "the position or state of being in control of a group of people", "the qualities that make someone a good leader", and “the ability to be a leader or the qualities a good leader should have”.

These dictionaries consulted do not explicitly define "research leadership." However, its meaning can be inferred by combining the general definitions of leadership with the context of research. As per the conversational search engine that uses LLMs Perplexity AI, “Research Leadership is the process of guiding and influencing research teams toward attaining the scientific goals, fostering a culture of innovation, and ensuring the integrity and effectiveness of research endeavors which involves strategic planning, resource management, and collaboration to advance knowledge in a specific field”. However, this definition may not be fully considered as this analysis shall be grounded on the selected studies and only provides initial insights in into understanding the healthcare context.

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In discussing research leadership, one might refer to the general concept of leadership as defined by these dictionaries. For instance: "Research leadership involves guiding teams toward achieving scientific goals, which aligns with the broader definition of leadership as 'the action of leading a group of people or an organization." While in the context of research leadership in higher education, Evans (2014) describes it as "the influence that one or more individuals have on the research-related behaviors, attitudes, or intellectual abilities of others." The study highlighted three key traits of professorial research leadership, such as the ability to improve individuals' capacity for making informed decisions, to achieve required standards, and to support the processes involved in research activities.

Using the conversational search engine that used LLMs Perplexity AI when prompted with "Define research leadership in healthcare settings," it generated that research leadership involves guiding research endeavors to improve patient care and healthcare outcomes (Perplexity, 2025). Also, research leadership is the process of guiding and facilitating research endeavors to maximize scientific quality and social impact. It involves supporting and nurturing research careers, fostering inclusive environments, and promoting collaboration across the research ecosystem (UK Research and Innovation, 2021; Evans, 2014). Effective research leadership requires a collaborative approach, recognizing multiple leadership roles and fostering environments that encourage innovation and social relevance (Times Higher Education, 2024). This leadership style involves creating environments that foster steadiness, articulate clear priorities, and nurture care among team members (Researcher Life, 2023). Sources supporting this definition include UKRI's emphasis on inclusive research practices (UKRI, 2021), Evans' perspective on effective leadership (Evans, 2014), and discussions on collaborative research environments (Times Higher Education, 2024; Researcher Life, 2023).

Figure 3

Wordle denoting key terms from the uses (definitions) research leadership.

In healthcare settings, research leadership can be defined as the process of guiding and facilitating research endeavors to improve patient care, health outcomes, and organizational efficiency. It involves promoting effective leadership styles to foster a positive work environment and adapt to the dynamic healthcare landscape (Crowell & Boynton, 2020; Tabish & Nabil, 2015). It also involves optimizing healthcare systems through effective resource management and strategic planning, ensuring that healthcare facilities operate efficiently (Indeed, 2023; Tabish & Nabil, 2015). Effective research leadership in healthcare requires strategic planning, interdisciplinary collaboration, and the integration of clinical leadership into policy-making processes (Denis & Gestel, as cited in Tabish & Nabil, 2015). Studies have shown that leadership interventions can significantly improve healthcare performance and guideline adherence, with a pooled effectiveness of 14.0% in before-after studies (Kumar et al., 2022).

As such, research leadership can be utilized in various contexts. It may include healthcare settings with diverse leadership styles, clinical leadership development, primary care and community health services, as well as organizational performance and team dynamics. These contexts highlight the versatility and importance of research leadership in improving healthcare outcomes and organizational performance across various settings.

Step 4: Determine Defining Attributes of Research Leadership

The "core of concept analysis" is the process involved in defining the attributes (Walker & Avant, 2014; 2019). The examined literature identified research leadership in healthcare settings as comprising five defining attributes, as shown (Table 4 and Figure 4). Initial analysis, with the aid of the conversational search engine that uses LLMs- Perplexity AI was prompted to provide its own analysis of the attributes based on the key themes from the 24 studies selected in the final screening in Cadima, which revealed 20 attributes. These were then assessed by the author in the second step; they were reviewed and grouped into five (5) broader categories of attributes with their descriptions, as shown in Table 4.

Table 4

Attributes of Research Leadership in Healthcare Settings

Attributes	Descriptions
1. Strategic Vision and System Improvement	Refers to the effective strategic planning and management, data- driven decision making, local leadership and quality improvement project impacts
2. Contextual Adaptation and Implementation	Refers to adaptability of interventions, integrating cultural and context-based programs and responding to changes.
3. Collaborative and Relational Leadership	Refers to supportive and adaptable styles, relational leadership for team cohesion, and leadership role- modelling
4. Workforce Support and Development	Refers to clarifying leadership roles, mitigating abusive supervision, supporting health workers, improving workforce composition and structured governance frameworks
5. Knowledge Translation and Evidence- Based Practice	Refers to competencies in research, in stakeholders, general and organizational factors and cultural adaptation framework.

Figure 4 shows the Dynamic Cycle of Research Leadership in Healthcare settings with the five attributes*: 1. Strategic Vision and System Improvement; 2. Contextual Adaptation and Implementation; 3. Collaborative and Relational Leadership; 4. Workforce Support and Development; and 5. Knowledge Translation and Evidence- Based Practice.*

Figure 4

Dynamic Cycle of the Attributes of Research Leadership in Healthcare Settings

Table 5 presents the summary of the antecedents across all 24 selected studies. Initially, the author independently assessed the presence of these attributes which was followed by prompting the conversational search engine that uses LLMs Perplexity AI also conducted the same analysis and the conflicts were resolved by revisiting the original articles.

As noted in the table, the "workforce support and development" attribute exhibits a very high representation. "Strategic vision and system improvement" attribute has high representation. Knowledge translation and evidence-based practice, contextual adaptation and implementation, and collaborative and relational leadership attributes each demonstrate moderate representation.

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Table 5

Attributes of Research Leadership in Healthcare Settings

Reference	Strategic Vision and System Improvement	Contextual Adaptation and Implementation	Collaborative and Relational Leadership	Workforce Support and Development	Knowledge Translation and Evidence-Based Practice
1. Alatawi et al. (2022)	✓	✓	✓		✓
2. Baeza & Ali (2016)		✓		✓	✓
3. Brunton et al. (2018)		✓		✓	✓
4. Cleary et al. (2018)	✓		✓	✓	
5. Damush et al. (2020)	✓		✓	✓	✓
6. Forrest et al. (2018)	✓	✓		✓	✓
7. Fothergill et al. (2022)	✓	✓		✓	
8. Garnett et al. (2018)	✓			✓	✓
9. Gholipour et al. (2018)	✓		✓	✓	✓
10. Heyns et al. (2019)	✓		✓	✓	
11. Khan et al. (2018)	✓		✓		✓
12. Khan et al. (2022)		✓	✓	✓	
13. King & Williams (2020)		✓	✓	✓	
14. Minogue et al. (2023)	✓			✓	✓
15. Misra-Hebert et al. (2019)		✓	✓	✓	
16. Mukamana et al. (2022)	✓	✓		✓	✓
17. Nakanjako et al. (2015)	✓	✓	✓	✓	
18. Nene (2018)	✓	✓	✓	✓	
19. Powell et al. (2017)	✓	✓	✓		✓
20. Rabie et al. (2022)		✓		✓	
21. Restivo et al. (2022)	✓		✓		
22. Riaz et al. (2023)			✓	✓	✓
23. VanDevanter et al. (2018)		✓			✓
24. Widdows et al. (2018)		✓			✓

Step 5: Construct a Model Case

The constructed cases depict the concept by integrating the attributes, antecedents, and consequences. As defined, a model case shall include all of the defining attributes (Walker & Avant, 2014; 2019). Again, with the aid of the conversational search engine that uses LLMs Perplexity AI, this model case was initially developed building upon the attributes of research leadership and then enhanced by the author to reflect the realities in the hospital setting related to the context of the case.

> For five years, Dr. Irl Matthew has served as the Chairman of the Research Committee of a tertiary training hospital in the Philippines. The physicians at this hospital, especially those enrolled in the Residency Training Program (RTP), are encouraged to cultivate a culture of research and innovation. He also acknowledges that although the hospital has outstanding residents, they struggle to balance their clinical duties and research endeavors, and their research competencies are not regularly developed. He has got the chance to change things.
>
> First, RCC Chairman Irl Matthew creates a strategic plan to improve the residency program's capacity for research *(Attribute 1).* By providing all residents with fundamental research knowledge and skills, this will promote an inquiry-based and evidence-based practice culture. He creates a thorough "Research Capability Enhancement Program" (RCEP) that offers protected research time, mentorship opportunities, and flexible schedule workshops.
>
> He then adjusts the RCEP to the hospital's unique requirements and available resources *(Attribute 2).* He evaluates the residents' present research abilities, the mentorship resources that are accessible within the Training department and in the hospital, and any potential obstacles to involvement (such as lack of statistical support or time restrictions). He finds funds for statistical tools and support, arranges workshops at times that fit residents, and sets up a mentorship program with seasoned researchers.
>
> Additionally, solid connections are made with important stakeholders *(Attribute 3).* To gain support for the RCEP, he works with the Chief of Clinics, Chairs of Training Departments, Research Coordinators, and Consultants. He forms a Research Advisory Committee with members drawn from several fields of expertise. He explains to residents the objectives and advantages of the RCEP, highlighting how it can improve patient care and their future prospects.
>
> Furthermore, Chairman Irl Matthew prioritizes helping the residents during the course of the program *(Attribute 4).* He makes certain that the RCEP offers top-notch instruction in research conceptualization, research design, data analysis, writing manuscripts, and creating funding proposals, as well as on dissemination and utilization. Additionally, he connects residents with seasoned research mentors who offer direction, encouragement, and project critique. Finally, Chairman Irl Matthew makes sure that the RCEP encourages the incorporation of research discoveries into clinical practice *(Attribute 5).* He also supports protected research time for residents, acknowledging the significance of time set apart for

academic pursuits. He urges residents to publish their work in peer-reviewed journals and give presentations of their research findings at conferences. Along with collaborating with clinical leaders to incorporate new results into patient care procedures, he also supports the adoption of evidence-based practices based on resident research.

Step 6: Construct Borderline, Related and Contrary Cases

Aside from the model case, Step 6 of Walker and Avant's concept analysis involves a definition of borderline, related, and contrary cases (Walker & Avant, 2014; 2019), among which one of these cases is analyzed here. In a similar manner, with the aid of the conversational search engine that uses LLMs Perplexity AI, these cases- borderline, related and contrary- were initially developed by building upon the attributes of research leadership in comparison to the model case and then enhanced by the author to reflect the realities in the healthcare setting related to the context of the case.

Borderline Case

Borderline cases contain most of the defining attributes of the concept, in this case, research leadership, being examined but not all of them (Walker & Avant, 2014; 2019).

> A resident physician in the hospital's Internal Medicine Department, Dr. Stiffi Ilyse, successfully completes research projects including the Interesting Case Report for Level I and Prospective Research as a culminating requirement. She actively participates in Dr. Matthew's RCEP. She fulfills some knowledge translation requirements by finishing the workshops, getting mentored, and presenting her research at a local hospital conference. Even though Dr. Stiffi Ilyse' gains from the RCEP, she does not actively participate in determining the program's strategic path. She does not look for ways to influence the training curriculum, push for changes, or suggest fresh research projects that support the objectives of the hospital, their department, and the Internal Medicine Society.
>
> Dr. Stiffi Ilyse does not actively seek out more mentorship, work with other residents on research projects, or take part in hospital-wide research activities, such as the annual research colloquium, after finishing her first research study during three years of residency training. Despite giving a presentation at a local conference, Dr. Stiffi does not share her research expertise, teach junior residents, publish her findings in an international peer-reviewed journal, or encourage an inquiry-based culture in the residency training program.

Related Case

A related case portrays a connection or relation to the concept while not fully embodying the concept (Walker & Avant, 2014; 2019).

> In order to assist the RCEP, Dr. Shanta Shane, the Chief of Clinics, carefully distributes hospital resources, such as research funds, research staff, office space,

equipment, statistical software, and journal subscriptions to internet databases. This guarantees that the program has the infrastructure it needs to run efficiently and accomplish its objectives. By emphasizing its advantages, honoring resident research accomplishments, and incorporating research involvement into performance reviews, she actively encourages residents to take part in the monthly RCEP. Additionally, Dr. Shanta Shane encourages a culture of inquiry among resident doctors and other clinical staff members within the residency training departments to argue for the value of research within the hospital and the strategic plan of the different societies. This includes emphasizing how crucial innovation is to expanding the skill and knowledge base.

Contrary Case

A contrasting example provides a clear illustration of the lack of the concept (Walker & Avant, 2014; 2019). This example should not display any of the key traits linked to research leadership, which is the concept being examined. It can be described as a situation that does not correspond with the intended concept.

Dr. Candice Faith, a senior consultant in the Internal Medicine Department, actively dismisses Dr. Irl Matthew's RCEP as a waste of time, resources, and resident effort. She openly questions the value of research for clinical practice and suggests that residents should focus solely on patient care. Her negativity is directed at undermining support for Matthew and his program. Dr. Candice Faith directly discourages residents from participating in the RCEP by scheduling them for extra-clinical duties during workshop times, refusing to approve research protocols with no apparent reason, and ridiculing their research interests. She fosters a belief among her team that clinical work is the most important thing, and research will not benefit them. Finally, Dr. Candice Faith actively resists the implementation of evidence-based practices derived from research, preferring to rely on her own clinical experience and intuition. She openly criticizes research findings that challenge her established practices and actively works to prevent their adoption, creating a hostile environment for innovation and evidence-based change.

Step 7: Identify Antecedents and Consequences

In order to clarify the social contexts in which research leadership is applied, this study identified its antecedents and consequences. Antecedents are events or factors that come before the occurrence of the intended concept (Walker & Avant, 2014; 2019). Similarly, with the aid of the conversational search engine that uses LLMs Perplexity AI, the identification of the antecedents and cases was also initially crafted based on the attributes, and cases- model, borderline, related and contrary- previously developed on research leadership and then enhanced by the author to reflect the healthcare context.

Antecedents of Research Leadership

The iterative process of concept analysis defines antecedents as incidents that must occur prior to the occurrence of the concept (Walker & Avant, 2014; 2019). By identifying antecedents, it helps us understand the factors that must be in place for a concept, like

research leadership, to develop. The analysis of the 24 studies reveals several key 3 antecedents: *Core research competencies and skills; Supportive environment; and Adaptive and ethical leadership styles.*

A foundational antecedent is the presence of core research competencies among individuals (Forrest et al., 2018) and in this study, the research leaders. Formal training programs are useful and can be used to improve better outcomes. For example, targeted training programs for district health managers can enhance system outcomes (Gholipour et al., 2018). This necessitates a more formalized approach to research training, mentorship, and tools to create a better framework for applying the research leadership skills.

Meanwhile, a supportive relational leadership improves cohesion within the team. Relational leadership supports a more collaborative and distributed process with a better impact (Cleary et al., 2018). For better outcomes, there is a need to engage senior members. Not engaging senior consultants and allowing them to undermine improvements is a negative influence. Hence, stakeholders should meet, or at least be aware, so that they can be part of positive and useful improvement initiatives. To create environments that truly support individuals, it is vital to strengthen well-supported leadership. Abusive management practices can be harmful and play a major role in driving up turnover rates (Riaz et al., 2023). These issues can suppress innovation and obstruct the development of psychological safety, which is essential for promoting research.

Consequences of Research Leadership

Consequences are the incidents or outcomes that occur as a result of the concept (Walker & Avant, 2014; 2019). In other words, consequences represent what happens or what results from the existence or application of the concept in a particular context. When examining this, consideration should be placed on individual improvement, team improvements, stakeholder success and framework, structure and scalability. The analysis reveals four key consequences: *Performance Improvement; Stakeholder Success; Adaptable Frameworks; and Knowledge Translation.*

Performance improvement is demonstrated through the successful implementation of team-based care practices. This approach correlates with enhanced performance on quality metrics, which in turn supports favorable outcomes and scalability. A critical aspect of this improved process is the necessity for focused attention. Understanding effective strategies can significantly enhance engagement and support. Furthermore, aligning public health programs with established goals, ensuring strategic coherence, and reducing research waste are essential (Alatawi et al., 2022).

In terms of stakeholder success, it is imperative for researchers to collaborate with management, government entities, and healthcare facilities to adopt a holistic approach to advancing the healthcare sector. Teams can develop competencies to better address challenges through a more robust relational framework (Cleary et al., 2018).

Regarding adaptable frameworks, the implementation of flexible interventions is crucial for enhancing the quality of care within specific settings, which may contribute to sustainability.

Such interventions should be designed to meet community needs and foster sustainable programs (Rabie et al., 2022).

Finally, in the realm of knowledge translation, a culture of proficiency and strong leadership can significantly improve understanding of the necessary actions to enhance evidence-based practice (EBP), fostering more positive attitudes towards system improvement. Collaborative efforts can also enrich the overall organizational culture. Leaders play a vital role in ensuring effective knowledge translation, which leads to improved outcomes and support (Powell, 2017). Additionally, leadership development within the workplace is essential (Gholipour, 2018). Ultimately, local organizations within healthcare facilities should focus on nurturing internal facilitators and establishing a systemic infrastructure to deliver evidence-based care effectively.

Step 8: Define Empirical Referents

Walker and Avant (2014, 2019) defined empirical referents as "classes or categories of real-world phenomena that, just by being or being present, show that the notion itself occurs." The presence of a concept's distinguishing features or attributes can be measured or seen using these real-world indicators. Empirical referents enable the concept's evaluation and validation while offering concrete proof of its existence (Walker & Avant, 2014). Again, with the aid of the conversational search engine that uses LLMs Perplexity AI, and from the identification of the antecedents and cases based on the attributes, and cases- model, borderline, related and contrary- previously developed on research leadership and then enhanced by the author to reflect the healthcare context, empirical referents have now been defined.

The conversational search engine that uses LLMs Perplexity AI was prompted to initially search for the potential empirical referents based on the 24 selected studies on research leadership and then evaluated by the author to reflect the healthcare context. Accordingly, an empirical referent is a greater number of strategic plans that incorporate research findings and are in line with the strategic vision and system improvement (Alatawi et al., 2022). They employed research instruments such as survey questionnaires to collect insights and feedback on stakeholder recommendations for improving the strategic planning process.

Furthermore, on the contextual adaptation and implementation, documented adoption or adaptation of local programs (Rabie et al., 2022) serves as its empirical referent. The Consolidated Framework for Implementation Research (CFIR) is a valuable tool in assessing and tailoring the implementation of team-based strategies to specific contexts (VanDevanter et al., 2018). On collaborative and relational leadership, measured levels of cohesion (Cleary et al., 2018) are its empirical referent. The Team Cohesion Scale may be used to assess the degree of support within a team. For workforce support and development, assessment of skills and greater success (Gholipour, 2018) is also aligned. Pre- and post-training assessments to evaluate changes in skills, and competencies may also be used. Lastly, improved data process that reflect a better climate from leaders (Powell, 2017) are important.

The EBPAS (Evidence-Based Practice Attitude Scale) (Powell et al., 2017) measures attitudes and beliefs regarding the adoption of evidence-based practices.

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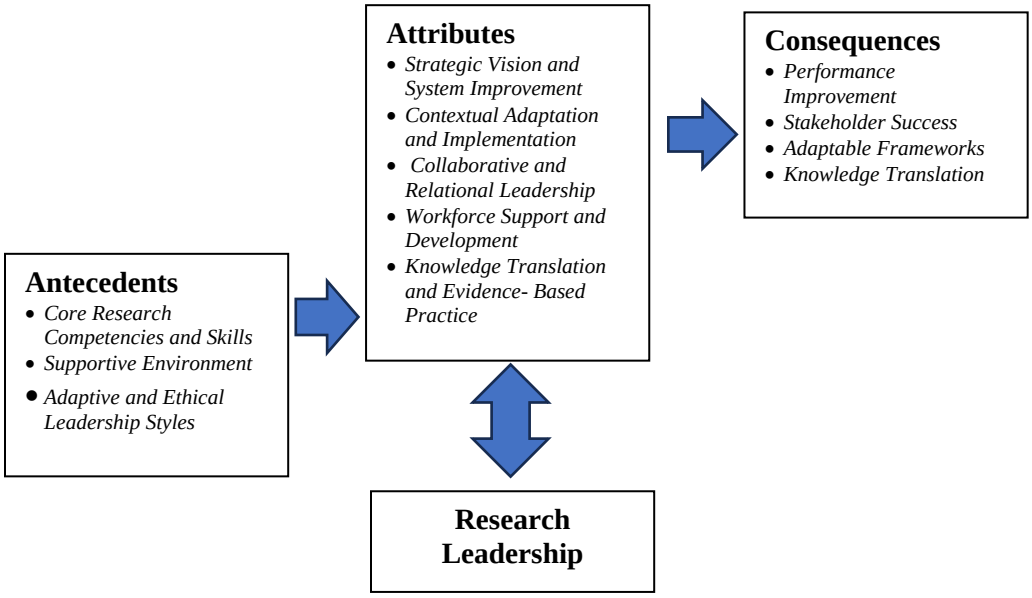
Figure 5

Antecedents, Attributes and Consequences of Research Leadership in Healthcare Settings



Lastly, to the instruments designated for each of the qualities, other research instruments function as stand-ins for research leadership. The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), which measures emotional intelligence competencies (Mayer, Salovey, Caruso, & Sitarenios, 2003) is included. Meanwhile, the Multifactor Leadership Questionnaire (MLQ) (Avolio & Bass, 2004) and the Leadership Practices Inventory (LPI) (Kouzes & Posner, 2017) evaluate individual leadership behaviors which may also be useful in the aspect of research leadership. They might be required to gauge least abstract concepts as markers of research leadership.

DISCUSSIONS

Given the limited existing research on the concept as also affirmed by the conversational search engine that uses LLMs Perplexity AI, this study provides a holistic yet multifaceted definition of research leadership that can serve as a foundation for its measurement in healthcare settings. As noted, there are no full definitions directly from other authors but inferred definitions or key aspects of research leadership as viewed by other researchers are provided. Research leadership, for instance, entails determining and enhancing the fundamental skills of researchers in Learning Health Systems (LHS). Stakeholder engagement, practical impact, and quick implementation of research findings to enhance health system outcomes are among these competencies (Forrest, Chesleay, Tregear & Mistry, 2018).

Meanwhile, Cleary, Toit, Scott and Gilson (2018) argued that research leadership necessitates the cultivation of relational leadership, which strengthens health system performance through increased trust, team cohesion, and enhanced autonomy for facility managers in decision-making. Further, research leadership is about implementing adaptable interventions and creatjng a higher quality of care. As espoused, this can foster the development of cooperative and sympathetic teams (Rabie et al., 2022). There are numerous significant ramifications for the healthcare industry from this deduced definition of research leadership. As recommended by Forrest, Chesley, Tregear, and Mistry (2018), a framework for creating and assessing training programs for research leadership highlights the value of communication and support.

In this study, 1) strategic vision and system improvement, 2) contextual adaptation and implementation, 3) collaborative and relational leadership, 4) workforce support and development, and 5) knowledge translation and evidence- based practice are some of the key themes that emerged as the attributes identified. These attributes are discussed towards clarifying the concept of research leadership.

In the *Attribute 1*, research leadership involves effective strategic planning to improve hospital efficiency (Alatawi et al., 2022). It puts forward data-driven decision-making and staff capacity building, where it sets the foundation. This initial phase involves defining a clear and compelling vision for research leadership in healthcare settings, where it determines the main areas that require improvement, establishes quantifiable objectives, and formulates strategic viewpoints. This vision covers pertinent healthcare issues and is in line with the institutional goals. Here, a needs assessment can be carried out to pinpoint areas that require strategic intervention. In line with organizational objectives plans to increase healthcare delivery's efficacy, efficiency, and equity can also be established, and clear, quantifiable goals can be developed. Restivo et al (2022) encourage the development of a leadership culture to leverage performance and adherence to the guideline in healthcare settings. As VanDevanter et al. (2017) argued, leadership engagement is a potential facilitator for implementing a new model, in which, may influence the performance of the role as research leaders.

Meanwhile, environmental adaptation is covered in *Attribute* 2 in the dynamic cycle, adapting the strategic vision to the specific context within the healthcare setting in which it will be implemented. It must have a good understanding of local requirements, resources, and cultural factors to ensure that solutions are applicable and workable. VanDevanter et al. (2017) claimed that it is capable of assessing the local context, which encompasses existing infrastructure, cultural norms, and accessible resources. Cultural adaptations can be successfully accomplished through formative evaluation, supported by thorough implementation frameworks like the Consolidated Framework for Implementation Research (CFIR). These frameworks allow for adaptable interpretations and adjustments. Moreover, it is crucial to provide clinical fellows with sufficient time to create evidence-based solutions for the challenges they face in their work environments (Nakajanko et al., 2015).

The significance of establishing solid bonds and encouraging cooperation among various health care stakeholders in the healthcare context is also emphasized in *Attribute 3*. To guarantee buy-in and shared ownership, it must involve community members, researchers, administrators, and clinicians in the study process. It might already identify important stakeholders and involve them in the research process (King & Williams, 2021), encouraging open communication, trust, and transparency among team members (Cleary, Toit, Scott, & Gilson, 2018), and creating plans for joint problem-solving and decision-making. As mentioned by Fothergill et al (2022), a standardized approach may support

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Table 6

Relational Analysis of the Attributes and Antecedents with Evidence

Attributes	Related Antecedents	Sample Related Evidence from Studies
1. Strategic Vision and System Improvement	Core research competencies and skills	• Identified 33 key competencies across seven areas that are essential for researchers working in the LHS context (Forrest, Chesley, Tregear & Mistry, 2018). • Clinician mentors play a crucial role in helping fellows develop their critical-thinking skills and carry out projects that aim to improve health service delivery at specific sites (Nakajanko et al., 2015). • Leadership positions in hospital settings are centered on achieving common goals while effectively managing resources and staff (Aini & Dzakiyullah, 2024).
2. Contextual Adaptation and Implementation	Supportive environment; Adaptive and ethical leadership styles	• Several challenges have been noted in providing timely acute and follow-up care for TIA, including difficulties in accessing brain imaging, a frequently changing house staff, poor care coordination, limited resources, and inadequate staff training (Damush et al., 2017). • Successful adoption of new team-based care delivery models depends on a practice's ability to adapt to changes and adjust team roles within workflows, which is shaped by local leadership and stable staffing (Misra-Hebert et al., 2018). • Success of initiatives in different hospital settings may be affected by the resources available, as well as the leadership and governance structures in place (Widdows, Reid, Roberts, Camacho & Heazell, 2018). • Importance of using frameworks like CFIR to assess implementation challenges in low- and middle-income countries is highlighted (VanDevanter et al., 2017).
3. Collaborative and Relational Leadership	Supportive environment; Adaptive and ethical leadership styles	• Building trust and fostering team unity across different levels of the healthcare system is crucial (Misra-Hebert et al., 2018). • Developing leadership skills is vital to fully harness the benefits of medical education (Nakajanko et al., 2015). • Role of relational leadership is important for enhancing the effectiveness of health systems; collaborative and distributed leadership models are necessary in resource-limited environments (Cleary, Toit, Scott & Gilson, 2018). • Shifting towards person-centered approaches in research supervision could enhance the research environment, as strong relationships between supervisors often lead to improved research results (Heyns et al., 2019). • Different leadership styles significantly influence hospital management practices and the level of employee engagement (Aini & Dzakiyyullah, 2024). • Encouraging difficult conversations among healthcare professionals necessitates changes at the individual, team, professional, and organizational levels (Kings & Williams, 2021).
4. Workforce Support and Development	Adaptive and ethical leadership styles	• Clear positive link between abusive supervision and increased turnover intention, as well as workplace deviance (Jaffery, Tauseef & Abrar, 2025) • Training programs, methods, and improvements in managers' understanding of the health system, along with the skills needed for effective organizational management, were considered acceptable (Gholipou et al., 2018) • Potential facilitators for the intervention included policies from the Ministry of Health that encourage a readiness for change, arising from insufficient training and a recognized need for skill development, along with a strong sense of collective efficacy to provide tobacco cessation services, assuming they receive the necessary training and resources (VanDevanter et al., 2017) • Coordinating patient care across different services, improving communication between service lines, and educating clinical staff about facility policies and evidence-based practices are crucial (Damush et al., 2017) • Shifting towards person-centered research supervision practices enhances the research environment, as positive relationships between supervisors and postgraduate students can lead to better outcomes in postgraduate research (Heyns et al., 2019).
5. Knowledge Translation and Evidence-Based Practice	Core research competencies and skills; Supportive environment; Adaptive and ethical leadership styles	• Clinicians working in organizations with strong cultural competencies or high levels of transformational leadership showed a better grasp of evidence-based practices (Powell et al., 2017) • Key factors at the system level included the involvement of clinical service leadership and the use of electronic tools to support continuous care across different services (Damush et al., 2017) • Hiring of nurses trained outside the UK in English NHS hospitals is linked to lower patient satisfaction. Relying on internationally educated nurses to fill the roles of locally trained ones may negatively impact the quality of care provided (Germack et al., 2018) • All active researchers in the organization expressed their support and knowledge needs, leading to the development of additional guidance to help researchers navigate the process (Minogue et al., 2022).

Advanced Clinical Practice (ACP) workforce development and enable ACPs to work across the four pillars of practice: education, leadership, research, and clinical practice. Also, Heyns et al. (2019) indicated that moving towards person-centered research supervision practices may enhance the research environment, as healthful relationships between supervisors may lead to increased research outcomes. However, a clear definition of supervision excellence needs to be established since supervision is a complex and dynamic process. Nene (2022) cited that the leadership roles of nurse managers must be described to eradicate confusion. It was also agreed that ethical leadership practices in entrepreneurial healthcare settings are a must for a sustainable culture (Jaffery, Tauseef & Abrar, 2025).

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Empowering the research team is *Attribute* 4. Giving healthcare professionals the education, tools, and assistance they require to be successful is the main goal of this phase. It includes fostering professional growth, addressing issues like burnout and workplace deviance, and establishing a healthy work environment. It can address issues like abusive supervision, workload imbalances, and workforce diversity (Jaffery, Tauseef, & Abrar, 2025; Germack, Griffiths, Sloane, Rafferty, Ball & Aiken, 2015), offer mentorship and training opportunities to improve skills and knowledge (Nakajanko et al., 2015; Gholipour et al., 2018), and put strategies into place to boost employee engagement, morale, and retention. Nakajanko et al. (2015) pointed out that structured mentorship and collaborative efforts, especially those focused on local healthcare programs, can effectively provide healthcare providers with crucial leadership skills.

Lastly, *Attribute* 5 focuses on putting evidence into practice wherein evidence-based practice is now being adapted. During this stage, research findings are converted into evidence-based procedures that enhance organizational performance and patient outcomes, such as in the form of clinical practice guidelines (CPG) in medicine and policies in other fields including nursing. This includes sharing research results, offering guidance and assistance for application, and keeping tabs on developments. Developing methods for communicating research findings to pertinent stakeholders, offering guidance and assistance in putting evidence-based practices into practice, tracking developments, and assessing how interventions affect patient outcomes, and establishing local support and leadership to encourage the adoption of new tactics are a few examples of possible activities (Minogue, Morrissey, & Terres, 2022).

Strategic investment in comprehensive global health leadership training at academic institutions, in partnership with public health programs, should be prioritized to prepare nurses and physicians to make evidence-based decisions that tackle healthcare challenges in Africa (Nakajanko et al., 2015). This initiative is inherently connected to the role of being a research leader within healthcare environments. Furthermore, the knowledge translation (KT) process facilitates the delivery of a clear message, fosters stakeholder engagement, formulates a plan to integrate diverse contexts, and provides a framework for assessing the application of findings in practice (Minogue, Morrissey, & Terres, 2022).

Instead of following a straight unidirectional line, these five attributes reflect a dynamic cycle of research leadership in healthcare that is cyclical and iterative in nature. Effective research leadership necessitates ongoing feedback, adaptation, and improvement at every stage, even though the phases are presented logically. Drawing on cooperative interaction with important stakeholders and a dedication to EBP, the particular activities within each phase should be customized to the local setting and the requirements of the healthcare facility.

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Table 7

Relational Analysis of the Attributes and the Consequences with Evidence

Attributes	Related Consequences	Sample Related Evidence from Studies
1. Strategic Vision and System Improvement	Performance Improvement	• Importance of effective leadership and strategic planning in improving hospital efficiency has been underscored by Alatawi et al. (2022). • Forrest, Chesley, Tregear, and Mistry (2018) highlighted staff training and supervision can enhance hospital performance. • Restivo et al. (2022) pointed out that fostering a strong leadership culture is crucial for boosting performance and compliance with guidelines in healthcare settings. • Recognized need for more support and training for general practitioners to help them identify young men who have sex with men (YMSM) and to raise their awareness about the health benefits of HPV vaccination for this at-risk group Merriel et al. (2018).)
2. Contextual Adaptation and Implementation	Stakeholder Success, Adaptable Frameworks	• Importance of using frameworks like CFIR to assess implementation challenges in low-middle income countries (VanDevanter et al., 2017) • Importance of adaptable interventions like Nyamekela4Care in enhancing quality of care in low-resource settings (Rabie et al., 2022) • Role of team-based interventions in improving service providers' emotional well-being and collaboration (Misra- Hebert et al., 2022)
3. Collaborative and Relational Leadership	Stakeholder Success, Performance Improvement	• Enhanced trust and team unity across different levels of the health system (Misra-Hebert et al., 2022) • Importance of relational leadership in improving the performance of health systems (Cleary, Toit, Scott & Gilson, 2018). • Essential role of collaborative and distributed leadership approaches in resource-constrained environments (Nakajanko et al., 2015) • Researchers at all levels have reported difficulties in engaging stakeholders, including evidence users and policymakers, to optimize the impact of their research (Minogue, Morrissey & Terres, 2022).
4. Workforce Support and Development	Performance Improvement, Stakeholder Success	• The training initiative significantly improved the managerial abilities, knowledge, and competencies of district health managers (Gholipour et al., 2018). • Deficiencies in training, resources, and oversight to effectively support Community Health Workers (CHWs) in their responsibilities (Niyigena et al., 2022) • Ongoing operational measures are necessary to ensure a consistent supply of medications, adequate supervision, in-service training, and to confront the social barriers to healthy behaviors and nutrition, particularly for women (Khan et al., 2018).)
5. Knowledge Translation and Evidence-Based Practice	Adaptable Frameworks, Knowledge Translation	• Clinicians working in organizations with strong cultures or high levels of transformational leadership have a better grasp of evidence-based practices (Powell et al., 2017) • General practitioners play a crucial role in preventing HPV-related illnesses among young men who have sex with men (Merriel et al., 2018). • CFIR identifies several important factors, such as relative advantage, the urgency for change, leadership involvement, collective efficacy, and the complexity of interventions (VanDevanter et al., 2017) • Urgent need for tailored strategies to address specific challenges faced in local healthcare settings (Nakajanko et al., 2015). • Both general and strategic organizational factors are vital in shaping knowledge and attitudes towards evidence-based practices (Powell et al., 2017). • Practice-based evidence is crucial for improving our understanding of the mechanisms that enable the successful implementation of care bundles (Widdows, Reid, Roberts, Camacho & Heazell, 2018). • Knowledge translation is a complex area, and researchers need sufficient support to maximize the impact of their findings (Minogue, Morrissey & Terres, 2022).

As previously discussed, antecedents are events or conditions that *must* exist or occur *before* the concept of interest can manifest (Walker & Avant, 2014, 2019). Identifying these antecedents is crucial as they are necessary preconditions for the concept – in this case, research leadership – to develop and function effectively. Without these foundational elements, the concept is unlikely to emerge or be sustained. In this study, antecedents included: *Antecedent* 1 Core research competencies and skills; *Antecedent* 2 Supportive environment; and *Antecedent 3* Adaptive and ethical leadership styles. Antecedent 1 is related to *Attributes* 1 and 5; *Antecedent* 2 with Attributes 2,3 and 5, while *Antecedent* 3 is with *Attributes* 2, 3, 4, and 5.

As to the consequences of the research leadership in relation to the research attributes, there were four that emerged: *Consequence 1 Performance Improvement*; *Consequence 2* Stakeholder Success; *Consequence* 3 Adaptable Frameworks; and *Consequence* 4 Knowledge Translation. *Consequence 1* is associated with *Attributes 1, 3 and 4.* Research leaders may greatly improve overall performance in healthcare organizations by supporting creative solutions, teamwork, and transparent communication. *Consequence* 2 is linked with *Attributes* 2, 3, and 4. Here, research leaders who strategically engage stakeholders, foster collaborative relationships, and embrace innovative practices contribute to the success of all those involved in the healthcare environment. *Consequence* 3 is connected with *Attribute* 5 wherein research leaders who exhibit high emotional intelligence can create flexible frameworks that respond effectively to the diverse needs and demands of healthcare clients and patients. *Consequence* 4 is also connected with *Attribute* 5, wherein research leaders who understand the emotional and contextual factors within and outside the healthcare system influencing knowledge dissemination are better equipped to facilitate the effective management of research findings into practice. The context of learning health system research, as outlined by Forrest, Chesley, Treager, and Mistry (2018), emphasizes the importance of integrating researchers into the health system and engaging stakeholders. These elements are crucial in this evolving field and may also apply to different healthcare settings.

Limitations

While this concept analysis strived to employ a rigorous approach, there might be a potential omission of relevant resources that limited the comprehensiveness of the findings as research leadership was not directly defined in the searched articles. Also, the use of the conversational search engine that uses LLMs Perplexity AI may have led the author to be dependent on its results. However, a saturation of themes was aimed to be achieved as reflected in Wordle across online sources utilized. Despite the effort to access some databases, additional resources with relevant data entered would likely have yielded further unique themes.

This analysis clarified research leadership by drawing upon dictionary definitions to understand its use outside healthcare. Previous concept analyses often examined different uses separately, but this analysis provides a healthcare-specific contextualization. This work has identified attributes across settings and provides a model for their identification. As such, these findings are transferable to diverse healthcare settings in health care theory, practice, and policy.

CONCLUSIONS

This conversational search engine that uses LLMs, Perplexity AI- aided concept analysis, has refined the understanding of research leadership in healthcare, distinguishing it from other contexts. A clarified definition with the use of the AI on research leadership, was identified as the ability to empower individuals to spearhead research initiatives that demonstrably improve healthcare delivery and patient outcomes. This leadership is characterized by a strategic vision for system-wide enhancements, a commitment to sustained operational support for effective interventions, collaborative practices that foster team cohesion and engagement, targeted workforce training to develop research capacity, and effective knowledge translation to integrate evidence-based practices into clinical settings. This definition's improved understanding is crucial for effective healthcare research quality service and initiatives, as a clear meaning prevents fragmented efforts.

This study provides a necessary structure and function in formulating a testable theoretical framework. Further, this conceptualization of research leadership facilitates the measurement of relevant indicators and the investigation of its relationship with other healthcare leadership concepts, as well as provides clarity to evaluating existing frameworks and may aid further testing in a real healthcare environment. In the literature, no agreed-upon definition of research leadership exists; however, this analysis supports elements for developing current healthcare knowledge and enhances professional communication, thus improving quality efforts. Future studies should expand upon these findings to establish a healthcare-specific definition of research leadership. This will improve comprehension, involvement, and application in evidence-based practices, policies, and theories.

List of Abbreviations

ACP- Advanced Clinical Practice
AI- Artificial Intelligence
EBP- Evidence-Based Practice
EBPAS- Evidence-Based Practice Attitude Scale
KT- Knowledge Translation
LLMs- Large Language Models
PRISMA- Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RIS- Research Information Systems

Declarations

Ethical Issues

This concept analysis was exempt from Institutional Review Board (IRB) approval as it did not involve human participants.

Availability of Data and Materials

All data relevant to this study are presented within the article. Since no additional datasets were created or analyzed during this study, data sharing is not applicable.

Competing Interests

The author declares that he has no known financial or other forms of interests or personal relationships that could potentially influence the work presented in this paper.

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Author's Contributions

This work is the sole authorship of the author, who independently designed the protocol, developed the search strategy, conducted the search, selected and extracted the data, analyzed and interpreted the results, and reviewed and approved the final manuscript. This concept analysis was aided by the conversational search engine that uses LLMs Perplexity AI to refine the search queries and access relevant literature efficiently. This tool enabled the author to navigate complex databases using natural language, enhancing the precision of search results as well as aiding in the analysis.

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