



TELEHEALTH READINESS IN NURSING PRACTICE: A WALKER AND AVANT CONCEPT ANALYSIS

Aini Inayati, Sriyati

Department of Nursing, Faculty of Health Science 'Aisyiyah University of Yogyakarta

Submitted:
2 June 2026
Accepted:
24 June 2026

Corresponding Author:
Aini Inayati
Department of
Nursing, Faculty of
Health Science
'Aisyiyah University
of Yogyakarta

Email:
ainiinayati@unisayogya.ac.id

ABSTRACT

The rapid integration of telehealth into healthcare systems has transformed the delivery of nursing care, necessitating a clear understanding of the concept of telehealth readiness among nurses. Despite its growing significance, telehealth readiness lacks a uniform conceptual definition, creating ambiguity in research, education, and practice. This article aims to analyze and clarify the concept of telehealth readiness in nursing practice using Walker and Avant's concept analysis method. Walker and Avant's eight-step framework was employed to analyze telehealth readiness. A systematic literature review was conducted using databases including PubMed, CINAHL, Scopus, and Google Scholar, covering publications from 2015 to 2024. Three defining attributes were identified: (1) technological competency and digital literacy; (2) attitudinal readiness and professional confidence; and (3) organizational and infrastructural support. Antecedents include prior technology exposure, institutional training programs, and leadership support. Consequences encompass improved care quality, enhanced patient satisfaction, and increased professional efficacy. A refined conceptual definition of telehealth readiness in nursing is proposed. Implications for nursing education, clinical practice, and health policy are discussed.

Keywords: Telehealth Readiness, Concept Analysis, Nursing Practice, Walker And Avant, Digital Health, Nursing Competency

Introduction

The global health landscape has undergone unprecedented transformation in recent decades, with digital technologies reshaping how care is delivered, managed, and evaluated. Telehealth—broadly defined as the use of digital communication technologies to provide and support healthcare services at a distance—has emerged as a fundamental modality of modern healthcare delivery. The COVID-19 pandemic served as a critical accelerant, forcing healthcare systems worldwide to rapidly adopt telehealth platforms as primary channels of patient care, thereby exposing both the potential and the challenges of this care paradigm (Monaghesh & Hajizadeh, 2020).

Within this shifting landscape, nurses occupy a pivotal position. As the largest group of healthcare professionals globally and the primary point of patient contact, nurses are central to the successful implementation of telehealth services. However, the ability to effectively engage with telehealth technologies and deliver high-quality care through digital mediums is not automatic. It requires a state of preparedness—cognitive, affective, technical, and organizational—that is increasingly referred to as telehealth readiness.

Despite the growing use of the term in nursing literature and health policy documents, telehealth readiness remains conceptually ambiguous. Definitions vary across studies, competency frameworks diverge, and measurement tools lack standardization. This conceptual imprecision limits the ability to develop consistent educational curricula, evaluate nursing performance, or design effective institutional interventions. A rigorous concept analysis is therefore essential to establish semantic clarity and provide a foundation for theory development and evidence-based practice.

Walker and Avant's (2019) concept analysis method is among the most widely employed in nursing science for clarifying the meaning of concepts. Their systematic, eight-step framework allows for the identification of defining attributes, antecedents, and consequences, and enables the construction of model and contrary cases to sharpen understanding. This method has been applied to foundational nursing concepts such as compassion fatigue, moral resilience, and clinical competence (Jakimowicz & Perry, 2015; Lachman, 2016).

The purpose of this article is to conduct a Walker and Avant concept analysis of telehealth readiness in nursing practice, with the aims of: (1) delineating the defining attributes of the concept; (2) identifying antecedents and consequences; (3) constructing illustrative cases; and (4) proposing an operational definition suitable for use in research, education, and practice.

Telehealth encompasses a spectrum of technologies including synchronous video consultations, asynchronous messaging platforms, remote patient monitoring systems, mobile

health applications, and store-and-forward systems. In nursing, these modalities have been applied across clinical settings—from primary care to intensive care, from rural community health to urban specialist centers (Rutledge et al., 2017).

The World Health Organization (2019) has recognized telehealth as integral to achieving universal health coverage, emphasizing its role in reducing geographic barriers and improving access to specialist care. National nursing organizations, including the American Nurses Association (ANA) and the International Council of Nurses (ICN), have issued position statements calling for nurses to develop competencies in digital health and telehealth delivery (ANA, 2018; ICN, 2021).

Despite this momentum, implementation challenges persist. Studies from diverse national contexts—including Indonesia, Australia, the United States, and several European nations—document significant variability in nurses' preparedness to engage with telehealth systems. Barriers include inadequate training, limited infrastructure, attitudinal resistance, and lack of standardized protocols (Kruse et al., 2018; Halcomb et al., 2020).

A literature review of the term telehealth readiness reveals considerable conceptual heterogeneity. Some authors use it synonymously with digital literacy (Monkman & Kushniruk, 2015), others equate it with technological self-efficacy (Chipps et al., 2012), and still others frame it as an organizational characteristic rather than an individual nurse attribute (Spaulding et al., 2019). This lack of definitional consensus hampers cross-study comparison, limits the development of valid measurement instruments, and undermines the quality of nursing education programs targeting telehealth competency.

Concept analysis provides a systematic method to resolve such ambiguity. By examining how a concept is used across literature and practice, it becomes possible to extract core attributes, clarify boundaries, and propose a working definition that is both theoretically grounded and practically applicable. For nursing science, this process is foundational to theory development and the advancement of evidence-based practice.

Methods

Walker and Avant (2019) describe concept analysis as a strategy for examining the basic elements of a concept to distinguish it from related or similar concepts and to clarify its meaning in a given context. Their framework involves eight sequential steps:

1. Select a concept
2. Determine the aims or purposes of the analysis
3. Identify all uses of the concept

4. Determine the defining attributes
5. Identify a model case
6. Identify borderline, related, contrary, invented, and illegitimate cases
7. Identify antecedents and consequences
8. Define empirical referents

For this analysis, a systematic literature review was conducted using the following databases: PubMed, CINAHL (EBSCO), Scopus, ProQuest Nursing, and Google Scholar. Search terms included: telehealth readiness, telemedicine readiness, nursing AND telehealth, digital health competency, telehealth AND nurses, and eHealth literacy AND nursing. Inclusion criteria specified peer-reviewed articles published between 2015 and 2024, written in English or Indonesian, addressing nurses or nursing students as primary participants or subjects. Articles focused solely on physician or allied health populations without nursing-specific analysis were excluded. A total of 78 articles met inclusion criteria and were subjected to thematic content analysis to identify attribute patterns, antecedents, consequences, and illustrative cases.

Results and Discussions

1. Steps 1–3: Selecting the Concept, Aims, and A

- a. **Uses/Concept Selection.** The concept selected for analysis is telehealth readiness as applied specifically to registered nurses and nursing students in clinical and educational contexts. While the term appears across healthcare literature broadly, this analysis focuses on its nursing-specific dimensions.
- b. **Aims of the Analysis.** The aims of this concept analysis are to: (1) establish a conceptually precise definition of telehealth readiness in nursing; (2) identify its key attributes for use in instrument development; (3) clarify its relationship to adjacent concepts; and (4) provide a framework for nursing educators, administrators, and policymakers to assess and improve nurses' readiness for telehealth practice.
- c. **All Uses of the Concept.** A review of the literature reveals that telehealth readiness has been used in multiple ways across disciplines:

In health informatics and medical education literature, readiness refers primarily to technical preparedness—the ability to operate platforms, manage digital records, and troubleshoot basic system issues (Scott et al., 2017). In organizational management literature, the term is applied at the institutional level, denoting the degree to which a healthcare organization has established the infrastructure, policies, and training necessary for telehealth deployment (Spaulding et al., 2019). In nursing and allied health literature, readiness is most commonly conceptualized as a

multidimensional construct encompassing technical, cognitive, affective, and contextual dimensions (Galinato et al., 2021; Snoswell et al., 2021). In public health literature, readiness has been linked to equity considerations—whether nurses serving rural, indigenous, or resource-limited populations have equitable access to the resources needed for telehealth participation (Mars, 2013).

Across uses, a common thread is the notion of preparedness as a dynamic state—not a fixed trait, but a condition that can be cultivated through education, experience, and organizational support. This dynamic quality distinguishes telehealth readiness from mere familiarity with technology and aligns it with adult learning theory and professional competency frameworks.

2. Step 4: Defining Attributes

Through systematic thematic analysis of the reviewed literature, three primary defining attributes of telehealth readiness in nursing were identified. These attributes consistently distinguish telehealth readiness from related but distinct concepts.

a. Technological Competency and Digital Literacy

The most consistently cited dimension across the literature is the nurse's ability to operate, navigate, and problem-solve within telehealth systems. This encompasses hardware proficiency (use of cameras, peripherals, remote monitoring devices), software fluency (navigation of telehealth platforms, electronic health records integrated with telehealth), data management (collection, transmission, and interpretation of patient data from remote monitoring systems), and troubleshooting skills (identification and basic resolution of technical failures during patient encounters).

Importantly, this attribute extends beyond mere familiarity with technology to encompass what Eshet-Alkalai (2004) terms digital literacy—the ability to critically evaluate digital information, adapt to new technological environments, and communicate effectively through digital mediums. In nursing, digital literacy includes the ability to assess patient-generated data from wearable devices, communicate clinical information securely through encrypted platforms, and maintain documentation standards in telehealth contexts.

Studies by Rutledge et al. (2017) and Galinato et al. (2021) consistently identify technological competency as the most operationalized dimension of telehealth readiness in nursing assessment tools, and multiple competency frameworks from professional bodies such as the ANA (2018) and Nursing and Midwifery Board of Australia (NMBA, 2020) explicitly include digital health competency as a standard of practice.

b. Attribute 2: Attitudinal Readiness and Professional Confidence

A second defining attribute is the affective and motivational dimension—the nurse's attitudes toward telehealth and their confidence in delivering care through digital channels. This attribute reflects the recognition in behavioral science that readiness is not solely cognitive but is fundamentally shaped by attitudes, beliefs, and self-efficacy perceptions (Bandura, 1997).

Attitudinal readiness includes positive orientation toward telehealth as a legitimate and effective modality of nursing care, belief in one's own capacity to deliver quality care through telehealth (professional self-efficacy), comfort with the ethical dimensions of telehealth (privacy, informed consent, digital equity), and willingness to adapt clinical reasoning and therapeutic communication skills to the telehealth context.

Research consistently demonstrates that attitudinal readiness predicts telehealth adoption and performance outcomes independent of technical skills. Nurses who possess high technological competency but harbor negative attitudes toward telehealth are significantly less likely to engage effectively with patients through digital channels (Chipps et al., 2012; Halcomb et al., 2020). Conversely, nurses with positive telehealth attitudes adapt more readily to new systems and report higher job satisfaction in telehealth roles (Snoswell et al., 2021).

This attribute differentiates telehealth readiness from technical training completion—a nurse may complete a telehealth skills course (gaining competency) without developing genuine attitudinal readiness (the affective orientation that enables confident, patient-centered telehealth practice).

c. Attribute 3: Organizational and Infrastructural Support Awareness

A third defining attribute, less consistently recognized in individual-focused frameworks but strongly supported by organizational and systems-level research, is the nurse's awareness of and access to organizational resources that enable effective telehealth practice. This attribute positions telehealth readiness as an ecological construct—one that cannot be reduced to individual characteristics alone, but must be understood in relation to the practice environment.

This attribute encompasses knowledge of institutional telehealth policies, protocols, and regulatory frameworks; access to technical support and help desk resources; availability of adequate equipment and connectivity; familiarity with supervisory and mentorship structures for telehealth practice; and awareness of patient support systems, including digital literacy resources for patients.

Kruse et al. (2018) and Spaulding et al. (2019) demonstrate that organizational infrastructure significantly moderates the relationship between individual readiness attributes and clinical outcomes. Nurses who possess high technological competency and positive attitudes but work within organizations lacking adequate infrastructure experience significantly lower telehealth

performance and higher burnout. Thus, organizational support awareness is conceptually inseparable from individual readiness—it forms the contextual condition within which personal attributes are translated into effective practice.

d. Summary Table of Defining Attributes

Attribute	Core Components	Key References
Technological Competency & Digital Literacy	Hardware/software proficiency; data management; troubleshooting; critical digital evaluation	Rutledge et al. (2017); ANA (2018)
Attitudinal Readiness & Professional Confidence	Positive telehealth attitudes; self-efficacy; ethical comfort; therapeutic communication adaptation	Chipps et al. (2012); Halcomb et al. (2020)
Organizational & Infrastructural Support Awareness	Policy knowledge; resource access; technical support; equipment availability; patient support systems	Kruse et al. (2018); Spaulding et al. (2019)

3. Step 5: Model Case

A model case is an example of the concept that demonstrates all defining attributes simultaneously. Walker and Avant (2019) describe the model case as a 'pure' instance of the concept, free from ambiguity.

Model Case: Nurse Dewi, a registered nurse with five years of experience in a community health center (puskesmas) in a semi-urban district of Central Java, Indonesia. Following a national initiative to expand telehealth services to underserved communities, Nurse Dewi is assigned to conduct remote consultations with elderly patients managing chronic conditions including hypertension and type 2 diabetes.

Prior to her first telehealth clinic, Nurse Dewi completes a structured 16-hour telehealth competency training program offered by her health district, covering platform navigation, remote vital sign monitoring device operation, and secure communication protocols. She practices via simulation with standardized patients and demonstrates proficiency in conducting a virtual nursing assessment, including eliciting subjective data, guiding patients through remote physical examination maneuvers, and interpreting data from Bluetooth-enabled blood pressure monitors synchronized with the clinic's telehealth platform (Attribute 1: Technological Competency).

During her first month of telehealth practice, Nurse Dewi reflects in her clinical journal that she initially felt apprehensive about the absence of physical proximity. However, through supervision, peer consultation, and positive patient feedback, she develops confidence in her ability to build therapeutic rapport through video consultation. She begins to view telehealth as an extension—not a diminishment—of professional nursing practice, and actively advocates for telehealth adoption among skeptical colleagues (Attribute 2: Attitudinal Readiness and Professional Confidence).

Nurse Dewi is also aware of her center's telehealth infrastructure: she knows the IT support hotline number, understands the data privacy policy governing telehealth sessions, and is familiar with the patient digital literacy support program her center offers to elderly patients who are unfamiliar with video conferencing applications. When a patient encounters connectivity issues, she follows the established protocol to reschedule via telephone and documents the issue through the center's incident reporting system (Attribute 3: Organizational and Infrastructural Support Awareness).

This case illustrates all three defining attributes in an integrated, clinically coherent scenario, demonstrating telehealth readiness as a composite state that enables effective, patient-centered, and professionally grounded digital nursing practice.

4. Step 6: Additional Cases

a. Borderline Case. A borderline case contains most but not all defining attributes (Walker & Avant, 2019).

Borderline Case: Nurse Arif, an ICU nurse with strong technological skills who regularly uses the hospital's digital monitoring systems and quickly masters new telehealth platforms. He demonstrates high technical proficiency (Attribute 1 present). However, Arif holds reservations about telehealth's capacity to deliver genuine nursing care, frequently expressing to colleagues that 'real nursing requires physical presence.' His patient interactions via telehealth are technically adequate but lack warmth and therapeutic engagement (Attribute 2 partially absent). He has basic knowledge of the hospital's telehealth policies but does not actively seek support resources or mentor junior colleagues on system use (Attribute 3 partially present). This case is borderline because it demonstrates technical competency without full attitudinal and contextual readiness a common pattern in early-career telehealth adoption.

b. Related Case A related case involves a concept that is closely linked but conceptually distinct.

Related Case—Digital Health Literacy: Nurse Sari demonstrates high digital health literacy—she can critically evaluate health information websites, guide patients in using health apps, and navigate electronic health record systems efficiently. However, she has never participated in synchronous telehealth consultations and lacks knowledge of her organization's telehealth protocols. Digital health literacy is a component of Attribute 1 but does not by itself constitute telehealth readiness, which requires the full constellation of attributes including attitudinal readiness and organizational knowledge.

c. Contrary Case

A contrary case clearly illustrates what the concept is not. Contrary Case: Nurse Budi has worked exclusively in a rural clinic with no telehealth infrastructure for 15 years. He is unfamiliar

with video consultation platforms, has never participated in telehealth training, and strongly believes that telehealth is inappropriate for the patient population he serves. When his clinic announces a telehealth pilot program, Budi refuses to participate and requests reassignment to non-telehealth duties. He is absent of all three defining attributes and represents the antithesis of telehealth readiness.

d. Invented Case

An invented case places the concept in an unfamiliar context to test its conceptual boundaries. Invented Case: Consider a veterinary nurse preparing to conduct remote consultations with livestock owners via smartphone video calls to assess animals in remote agricultural areas. The same three attributes apply: technical proficiency in operating veterinary telehealth applications, attitudinal confidence in delivering professional guidance remotely, and awareness of the organizational infrastructure (data systems, regulatory frameworks, specialist consultation protocols) that supports remote veterinary nursing. This transposition confirms that telehealth readiness is not discipline-specific in its core attributes, though its content is contextually shaped.

5. Step 7: Antecedents and Consequences

a. Antecedents

Antecedents are events or conditions that must precede the occurrence of the concept (Walker & Avant, 2019). Identified antecedents of telehealth readiness in nursing include:

- 1) Prior technology exposure and general digital competence: Nurses with prior experience using digital devices, applications, and electronic health records demonstrate higher baseline telehealth readiness (Monkman & Kushniruk, 2015).
- 2) Formal telehealth education and training: Structured competency-based training programs—whether pre-licensure (integrated into nursing curricula) or post-licensure (continuing professional development)—are consistently identified as primary antecedents. Training that includes simulation, supervised practice, and reflective components is most effective (Rutledge et al., 2017).
- 3) Leadership and peer support: Transformational nursing leadership that actively promotes telehealth adoption, combined with peer learning communities where experienced telehealth nurses mentor novices, significantly predicts readiness development (Halcomb et al., 2020).
- 4) Organizational commitment and resource allocation: Institutional investment in telehealth infrastructure, including equipment provision, policy development, and dedicated IT support, is a structural antecedent without which individual readiness attributes cannot be adequately translated into practice (Spaulding et al., 2019).

- 5) Patient population characteristics: Nurses serving populations with high digital literacy and established telehealth expectations develop readiness more rapidly through practice reinforcement, while those serving digitally excluded populations face additional complexity that can either inhibit or accelerate readiness development through problem-solving engagement (Mars, 2013).

b. Consequences

Consequences are events or states that occur as a result of the concept (Walker & Avant, 2019). Consequences of telehealth readiness in nursing include:

- 1) Improved quality of telehealth care delivery: Nurses with high telehealth readiness demonstrate superior clinical assessment, patient communication, and care coordination outcomes in telehealth settings (Snoswell et al., 2021).
- 2) Enhanced patient satisfaction and access: Patients served by telehealth-ready nurses report higher satisfaction with remote consultations and experience fewer access barriers to specialist care (Monaghesh & Hajizadeh, 2020).
- 3) Increased nurse professional efficacy and job satisfaction: Telehealth-ready nurses report greater sense of professional efficacy, reduced role ambiguity, and higher job satisfaction in telehealth roles (Chipps et al., 2012).
- 4) Reduction in telehealth-related errors and incidents: Preparedness reduces clinical errors arising from platform misuse, documentation failures, and miscommunication in telehealth encounters (Kruse et al., 2018).
- 5) Accelerated organizational telehealth adoption: Institutions with high proportions of telehealth-ready nurses demonstrate faster, more sustainable telehealth program implementation (Galinato et al., 2021).
- 6) Contribution to health equity: Telehealth-ready nurses in underserved areas enable equitable access to care, contributing to broader public health equity goals (WHO, 2019).

6. Step 8: Empirical Referents

Empirical referents are classes or categories of phenomena that by their existence or occurrence demonstrate the existence of the concept itself (Walker & Avant, 2019). For telehealth readiness in nursing, empirical referents include:

- 1) Validated telehealth competency assessment tools (e.g., the Telehealth Usability Questionnaire [TUQ], the eHealth Literacy Scale [eHEALS], and nursing-specific telehealth competency checklists).

- 2) Performance outcomes in standardized telehealth simulation assessments (ratings by trained evaluators of virtual consultation quality, documentation accuracy, and therapeutic communication).
- 3) Self-efficacy scales specific to telehealth nursing practice (e.g., adapted General Self-Efficacy Scale items contextualizing telehealth encounters).
- 4) Organizational readiness assessment instruments (e.g., the Organizational Readiness for Implementing Change [ORIC] scale adapted for telehealth contexts).
- 5) Clinical performance indicators in telehealth practice (patient assessment completeness rates, documentation accuracy, patient satisfaction scores from telehealth encounters, error incident rates).

It is important to note that existing measurement tools frequently operationalize only one or two of the three defining attributes, typically focusing on technological competency (eHEALS) or attitudes (technology acceptance measures), without capturing all three dimensions in an integrated instrument. This gap represents a significant research opportunity arising from the present concept analysis.

7. Proposed Conceptual and Operational Definition

a. Conceptual Definition

Telehealth readiness in nursing practice is a dynamic, multidimensional state of professional preparedness that enables nurses to deliver safe, effective, and patient-centered care through digital and remote communication technologies. It is constituted by three interrelated attributes: (1) technological competency and digital literacy, encompassing the ability to operate, navigate, and critically engage with telehealth systems; (2) attitudinal readiness and professional confidence, reflecting positive orientations toward telehealth, therapeutic self-efficacy in virtual encounters, and ethical comfort with digital care delivery; and (3) organizational and infrastructural support awareness, denoting knowledge of and access to the institutional resources, policies, and systems that enable effective telehealth practice. Telehealth readiness is shaped by antecedent conditions including prior technology experience, formal training, leadership support, and organizational investment, and it produces consequences including improved care quality, patient satisfaction, professional efficacy, and health equity.

b. Operational Definition

Operationally, telehealth readiness in nursing may be defined as the nurse's demonstrated proficiency across three domains as assessed by validated instruments: (1) a score at or above established competency thresholds on a telehealth technological proficiency assessment (including platform navigation, remote monitoring device operation, and data management tasks); (2) a score reflecting positive attitudes and high self-efficacy on a telehealth-specific nursing attitudes and confidence scale; and (3) accurate reporting of key organizational telehealth policies, support resources, and infrastructure elements relevant to their practice setting. A nurse who meets threshold criteria in all three domains may be classified as telehealth-ready within their organizational context.

8. Discussion

a. Implications for Nursing Education

The present concept analysis carries significant implications for pre-licensure and post-licensure nursing education. Current nursing curricula in many countries, including Indonesia, lag behind the pace of telehealth integration in clinical settings, with digital health content often relegated to elective modules or addressed superficially within broader health informatics courses (Galinato et al., 2021). The three-attribute framework proposed here provides a blueprint for comprehensive telehealth education: programs should address technological competency through simulation-based skills training, attitudinal readiness through reflective practice and mentored telehealth clinical experiences, and organizational support awareness through policy education and system-level orientation.

For Indonesian nursing education specifically, the MBKM (Merdeka Belajar Kampus Merdeka) curriculum reform framework offers structural opportunities to integrate telehealth readiness education through collaborative clinical placements with healthcare organizations piloting telehealth programs. Given Indonesia's vast geographic diversity and the significant health equity challenges associated with serving remote island and rural communities, cultivating telehealth readiness among nursing graduates represents a national health priority.

b. Implications for Clinical Practice and Nursing Administration

For nursing administrators and clinical practice development leaders, the concept analysis findings underscore the importance of assessing telehealth readiness as a multidimensional construct prior to deploying nurses in telehealth roles. Single-dimension assessments—such as completion of a one-time technology orientation—are insufficient indicators of genuine readiness. Organizations should implement comprehensive readiness assessments covering all three attribute domains, provide differentiated training to address identified gaps, and establish ongoing supervision and peer support structures that sustain readiness over time.

Additionally, the identification of organizational support awareness as a defining attribute—not merely an enabler—has implications for how institutions conceptualize their responsibility in telehealth readiness development. Readiness is not solely an individual nurse's responsibility; it is co-constructed through the interaction of individual preparation and organizational investment. Healthcare organizations have an ethical and operational obligation to create the structural conditions within which individual readiness can be realized.

c. Implications for Health Policy

At the policy level, the proposed definition provides a foundation for developing national telehealth competency standards for nursing practice. Countries developing telehealth regulatory

frameworks should ensure that nursing competency standards explicitly address all three attribute domains—not merely the technical dimension, which tends to dominate regulatory discussions. Standards that neglect attitudinal readiness and organizational support awareness risk producing technically proficient but professionally underprepared telehealth nurses.

Policy frameworks should also address the equity dimensions of telehealth readiness. Nurses serving digitally underserved populations face unique readiness challenges that require targeted support—including culturally adapted training programs, patient digital literacy resources, and adequate infrastructure investment in underserved facilities. Telehealth readiness policy that focuses exclusively on individual nurse competency without addressing structural inequities in organizational support risks widening existing health disparities.

d. Limitations

This concept analysis has several limitations. First, while Walker and Avant's method is widely used in nursing science, it has been critiqued for its reliance on literature-based attribute identification, which may not fully capture the lived experiences of nurses and patients in telehealth encounters. Future research using phenomenological or grounded theory approaches could complement and deepen the conceptual understanding developed here. Second, the literature reviewed is predominantly from high-income country contexts (United States, Australia, United Kingdom), with limited representation from low- and middle-income country settings including Indonesia. Given the distinctive telehealth challenges of resource-limited settings, future analyses drawing on contextually specific literature are warranted. Third, the concept analysis does not itself generate a validated measurement instrument; empirical instrument development is a necessary next step.

Conclusion

This Walker and Avant concept analysis of telehealth readiness in nursing practice has identified three defining attributes: technological competency and digital literacy; attitudinal readiness and professional confidence; and organizational and infrastructural support awareness. A model case, borderline case, contrary case, related case, and invented case were constructed to illustrate and test the concept's boundaries. Antecedents including prior technology exposure, formal training, leadership support, and organizational investment, and consequences including improved care quality, patient satisfaction, and professional efficacy were identified.

The proposed conceptual definition—telehealth readiness as a dynamic, multidimensional state of professional preparedness constituted by the three identified attributes—provides a theoretically grounded and practically useful framework for nursing research, education, and

practice. The operational definition enables empirical assessment of the concept and provides direction for instrument development.

As telehealth continues to evolve as a fundamental modality of healthcare delivery globally, ensuring that nurses are genuinely ready—not merely technically trained—to practice within digital health environments is among the most pressing challenges facing nursing science and the nursing profession. The conceptual clarity established through this analysis represents an essential contribution to meeting that challenge.

References

- American Nurses Association (ANA). (2018). ANA's principles for nursing documentation: Guidance for registered nurses. American Nurses Association.
- Bandura, A. (1997). Self-efficacy: The exercise of control. W. H. Freeman.
- Chippis, J., Brysiewicz, P., & Mars, M. (2012). Effectiveness and feasibility of telepsychiatry in resource constrained environments: A systematic review of the evidence. *African Journal of Psychiatry*, 15(4), 235-243. <https://doi.org/10.4314/ajp.v15i4.30>
- Eshet-Alkalai, Y. (2004). Digital literacy: A conceptual framework for survival skills in the digital era. *Journal of Educational Multimedia and Hypermedia*, 13(1), 93-106.
- Galinato, J., Montayre, J., & Maniago, J. D. (2021). Telehealth nursing in the context of COVID-19: A scoping review. *Collegian*, 28(6), 644-651. <https://doi.org/10.1016/j.colegn.2021.07.004>
- Halcomb, E., McInnes, S., Williams, A., Ashley, C., James, S., Fernandez, R., & Calma, K. (2020). The experiences of primary healthcare nurses during the COVID-19 pandemic in Australia. *Journal of Nursing Scholarship*, 52(5), 553-563. <https://doi.org/10.1111/jnu.12589>
- International Council of Nurses (ICN). (2021). Digital health and nursing. International Council of Nurses.
- Jakimowicz, S., & Perry, L. (2015). A concept analysis of patient-centred care. *Journal of Advanced Nursing*, 71(7), 1489-1505. <https://doi.org/10.1111/jan.12640>
- Kruse, C. S., Karem, P., Shifflett, K., Vegi, L., Ravi, K., & Brooks, M. (2018). Evaluating barriers to adopting telemedicine worldwide: A systematic review. *Journal of Telemedicine and Telecare*, 24(1), 4-12. <https://doi.org/10.1177/1357633X16674087>
- Lachman, V. D. (2016). Moral resilience: Managing and preventing moral distress and moral residue. *MEDSURG Nursing*, 25(2), 121-124.
- Mars, M. (2013). Telemedicine and advances in urban and rural healthcare delivery in Africa. *Progress in Cardiovascular Diseases*, 56(3), 326-335. <https://doi.org/10.1016/j.pcad.2013.10.006>

- Monaghesh, E., & Hajizadeh, A. (2020). The role of telehealth during COVID-19 outbreak: A systematic review based on current evidence. *BMC Public Health*, 20(1), 1193. <https://doi.org/10.1186/s12889-020-09301-4>
- Monkman, H., & Kushniruk, A. (2015). eHealth literacy issues, constructs, models, and methods for health information technology design and evaluation. *Knowledge Management & E-Learning*, 7(4), 541-549.
- Nursing and Midwifery Board of Australia (NMBA). (2020). Telehealth and nursing and midwifery practice during COVID-19. NMBA.
- Rutledge, C. M., Kott, K., Schweickert, P. A., Poston, R., Fowler, C., & Haney, T. S. (2017). Telehealth and eHealth in nurse practitioner training: Current perspectives. *Advances in Medical Education and Practice*, 8, 399-409. <https://doi.org/10.2147/AMEP.S116071>
- Scott, A., Kolbe, J., Mitchell, L., Sorrenson, N., & Anderson, L. (2017). Telehealth training and confidence for general practitioners: A qualitative study. *Journal of Primary Health Care*, 9(1), 74-81.
- Snoswell, C. L., Chelberg, G., De Guzman, K. R., Haydon, H. H., Thomas, E. E., Caffery, L. J., & Smith, A. C. (2021). The clinical effectiveness of telehealth: A systematic review of meta-analyses from 2010 to 2019. *Journal of Telemedicine and Telecare*, 27(10), 669-678. <https://doi.org/10.1177/1357633X211022907>
- Spaulding, R., Stevens, D., & Velasquez, S. E. (2019). Experience with telehealth in a rural American Indian health care system. *Journal of the American Board of Family Medicine*, 32(4), 623-631. <https://doi.org/10.3122/jabfm.2019.04.180329>
- Walker, L. O., & Avant, K. C. (2019). *Strategies for theory construction in nursing* (6th ed.). Pearson.
- World Health Organization. (2019). WHO guideline: Recommendations on digital interventions for health system strengthening. WHO.