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# Compassion through technology: Digital empathy concept analysis and implications in nursing

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## Abstract

**Objective:** Digital empathy is an emerging concept in telehealth nursing, emphasizing emotional engagement and compassionate communication in virtual care settings. Despite its importance, digital empathy remains underexplored. This concept analysis aims to define digital empathy in nursing, explore its key attributes, antecedents, consequences, challenges, and actionable recommendations for practice.

**Methods:** Using Walker and Avant's eight-step framework, a comprehensive literature review was conducted on digital empathy in telehealth nursing. A total of 52 sources were reviewed, comprising 46 research articles, four books, and two web pages, published between 2000 and 2024.

**Results:** This concept analysis identifies key attributes of digital empathy in nursing, including authenticity, trust-building, communication effectiveness, emotional engagement, adaptability, technological proficiency, and cultural sensitivity critical for meaningful connections in telehealth. Antecedents encompass digital literacy, emotional intelligence, supportive infrastructures, and cultural competence, emphasizing individual, contextual, and organizational factors. Consequences include enhanced patient satisfaction, trust, adherence to treatment, improved nurse well-being, and organizational benefits such as team cohesion and reduced staff turnover. Challenges such as cultural variability, technological limitations, and the lack of validated measurement tools highlight barriers to effective implementation.

**Conclusion:** This concept analysis underscores the vital role of digital empathy in telehealth nursing. By incorporating its attributes and antecedents, healthcare organizations can enhance patient outcomes and foster supportive, patient-centered environments. Addressing measurement and technological gaps will be pivotal in fully realizing the benefits of digital empathy in telehealth. Actionable recommendations include implementing targeted training, developing standardized tools, and leveraging artificial intelligence advancements to enhance empathetic communication in telehealth.

## Keywords

Digital empathy, telehealth nursing, patient-centered care, technological proficiency, nursing practice, concept analysis

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## Introduction

The integration of digital technologies into healthcare has transformed nursing practice, offering innovative solutions to enhance accessibility, efficiency, and patient-centered care.[1,2] Telehealth and other virtual care platforms have become indispensable, particularly during public health crises such as the COVID-19 pandemic, which highlighted the critical role of technology in ensuring continuity of

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care.[3] These advancements allow nurses to provide consultations, monitor patient health, and offer support to individuals in remote or underserved areas. However, while these technologies have increased the reach and efficiency of healthcare delivery, they have also introduced unique challenges, particularly in maintaining the empathetic communication essential to the nursing profession.[4]

Empathy, a cornerstone of nursing practice, is defined as the ability to understand and share another's emotional state. It fosters trust, strengthens the nurse–patient relationship, and is closely associated with improved patient outcomes, including adherence to treatment plans and satisfaction with care.[5,6] Traditionally, empathy in nursing has relied on both verbal and non-verbal cues. Non-verbal cues such as tone of voice, facial expressions, and physical gestures play a crucial role in face-to-face interactions, helping convey warmth and understanding. Meanwhile, verbal expressions of empathy including reflective listening ("It sounds like you're feeling overwhelmed"), restating ("So, you're saying that the pain has been getting worse?"), validation ("I understand why this is frustrating for you"), and summarizing ("Let me make sure I understand—you've been experiencing discomfort, and you're looking for ways to manage it") help communicate compassion and emotional attunement in clinical interactions.[7–9] However, digital environments constrain these traditional forms of communication, requiring nurses to adapt their strategies to effectively convey empathy in virtual settings.[8,9]

The emergence of digital empathy—the ability to demonstrate empathy through digital communication tools—has been proposed as a solution to the challenges posed by virtual healthcare interactions.[8] Digital empathy involves adapting traditional empathetic skills to virtual platforms such as video calls, telemonitoring systems, secure messaging applications, and text-based interactions.[8,9] It ensures that patients feel supported, valued, and understood, even in the absence of physical proximity. While video-based telehealth interactions allow for some non-verbal expressions such as tone of voice and facial expressions, text-based or asynchronous communication relies entirely on verbal techniques to ensure emotional connection. In these settings, empathetic language including acknowledgment statements such as "I hear you, and I understand your concerns," or personalized responses like "It makes sense that this would be stressful for you," becomes essential for fostering trust in telehealth messaging, secure emails, and chat-based.[8,10]

To bridge the empathy gap in digital communication, nurses must be deliberate in their use of structured written communication, explicit verbal affirmations, and digital tone awareness. For example, when responding to a patient expressing frustration via text, a nurse might validate their feelings by writing, "I can see how this situation would be frustrating. Let's work together to find a solution that makes you feel more comfortable." Similarly, using open-ended questions such as "Can you share more details about how this has been affecting you?" encourages deeper patient engagement, making them feel heard and understood. Additionally, timely responses such as promptly acknowledging a patient's concerns even before offering a solution reinforce empathetic presence in virtual care.[11] By integrating both verbal and non-verbal techniques across various digital platforms such as adjusting tone in video calls while ensuring clarity in text-based messages, healthcare providers can effectively convey compassion and understanding, strengthening patient–provider relationships in telehealth settings.[11,12]

## The significance of the study

The increasing reliance on telehealth has raised concerns about the potential erosion of empathetic communication in nursing practice.[8,9,12] Unlike in-person interactions, virtual platforms often limit non-verbal communication and physical proximity, which are integral to building rapport and trust with patients. This can lead to decreased patient satisfaction, diminished emotional well-being, and lower adherence to care plans.[13] Furthermore, many nurses lack formal training in digital communication, leaving them unprepared to adapt traditional empathy practices to virtual environments.[14] As telehealth continues to expand, there is an urgent need to explore how empathy can be effectively conveyed in digital settings to maintain the quality and humanity of nursing care.[12]

To address these challenges, this concept analysis systematically examines the key attributes, antecedents, and consequences of digital empathy, providing a structured framework tailored to nursing practice. Analyzing digital empathy is vital for the advancement of nursing in the digital era. As technology-mediated interactions become increasingly common, it is essential for nurses to acquire the skills and strategies necessary to provide compassionate, patient-centered care in virtual settings.[1,8] While existing theories acknowledge the importance of empathy in digital interactions, they often fail to provide clear guidance on its practical application, measurement, and integration into telehealth nursing.[11–13] Many prior discussions focus on general psychological or communication theories, without detailing how digital empathy should be implemented in virtual patient care.[8,11,14] By defining how digital empathy functions in telehealth, this study ensures that empathy is not only conceptually understood but also operationalized for real-world use in nursing education, practice, and policy.[5–9]

Hence, beyond its theoretical implications, this study highlights the practical significance of digital empathy in bridging the gap between technology and human

connection in healthcare. As digital healthcare evolves, ensuring a balance between efficiency and emotional engagement is crucial for maintaining high-quality, ethical nursing care. A structured approach to digital empathy can enhance patient outcomes, strengthen nurse–patient relationships, and uphold ethical and professional standards in an increasingly technology-driven healthcare landscape.[9,12] By integrating digital empathy into telehealth consultations, remote patient monitoring, and digital nursing education, this study reinforces the importance of compassion in virtual care, ensuring that technological advancements support, rather than diminish, the humanistic essence of nursing.

## Aim of the study

The primary aim of this concept analysis is to explore and define the concept of digital empathy and its determinants within the context of nursing practice.

## Methods

### Design

This concept analysis was conducted using Walker and Avant's[15] framework, as illustrated in Figure 1. The framework provides a systematic approach to exploring and refining concepts in nursing and healthcare.[15,16] The analysis was designed to define digital empathy, identify its attributes, antecedents, and consequences, and provide a theoretical and empirical foundation for its application in nursing practice.

### Literature review

A comprehensive review of the literature was undertaken to gather relevant information on digital empathy in nursing and telehealth contexts. The search included peer-reviewed journal articles, books, dictionaries, and gray literature. Databases such as PubMed, CINAHL, Scopus, PsycINFO, and Google Scholar were utilized, along with targeted searches on reputable websites for additional resources. Keywords included "digital empathy," "telehealth communication," "virtual care nursing," and "nursing empathy in telehealth."

The search covered publications from 2000 to 2024, reflecting a period of rapid advancements in telehealth technologies and their integration into nursing practice. Inclusion criteria focused on English-language publications that directly addressed empathy in digital or telehealth/virtual contexts, with particular emphasis on nursing and patient–provider communication. Articles unrelated to healthcare or focusing exclusively on face-to-face settings were excluded.

Following a comprehensive review of approximately 120 sources, duplicates and irrelevant materials were excluded, resulting in a final selection of 52 references. These include 46 research articles, 4 books, and 2 web pages. The reviewed literature consistently highlighted recurring themes such as the challenges of conveying

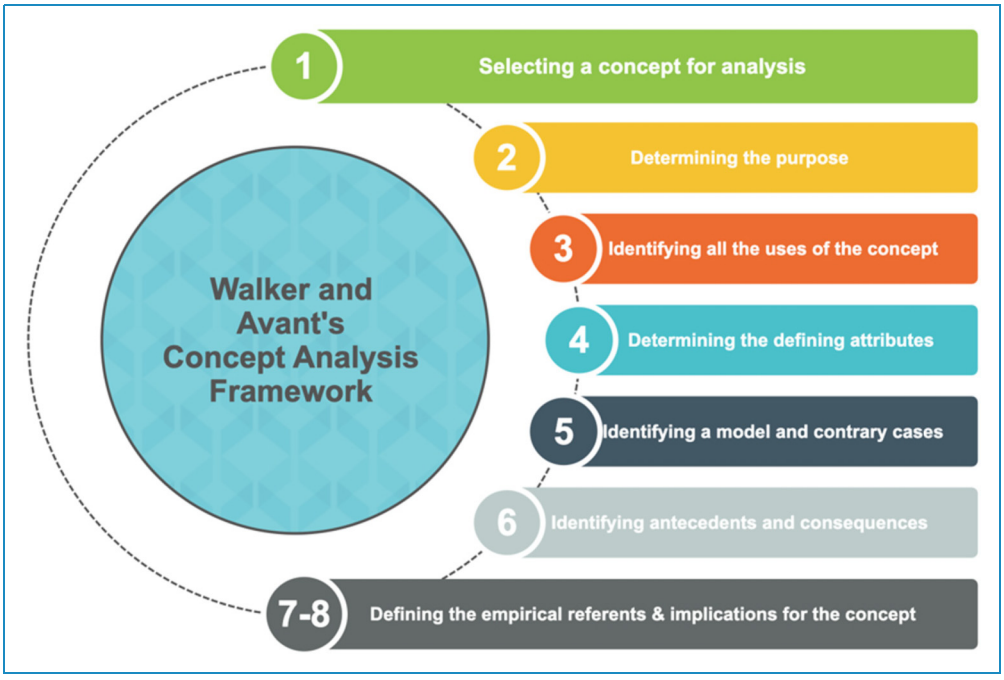


**Figure 1.** Walker and Avant's concept analysis framework.

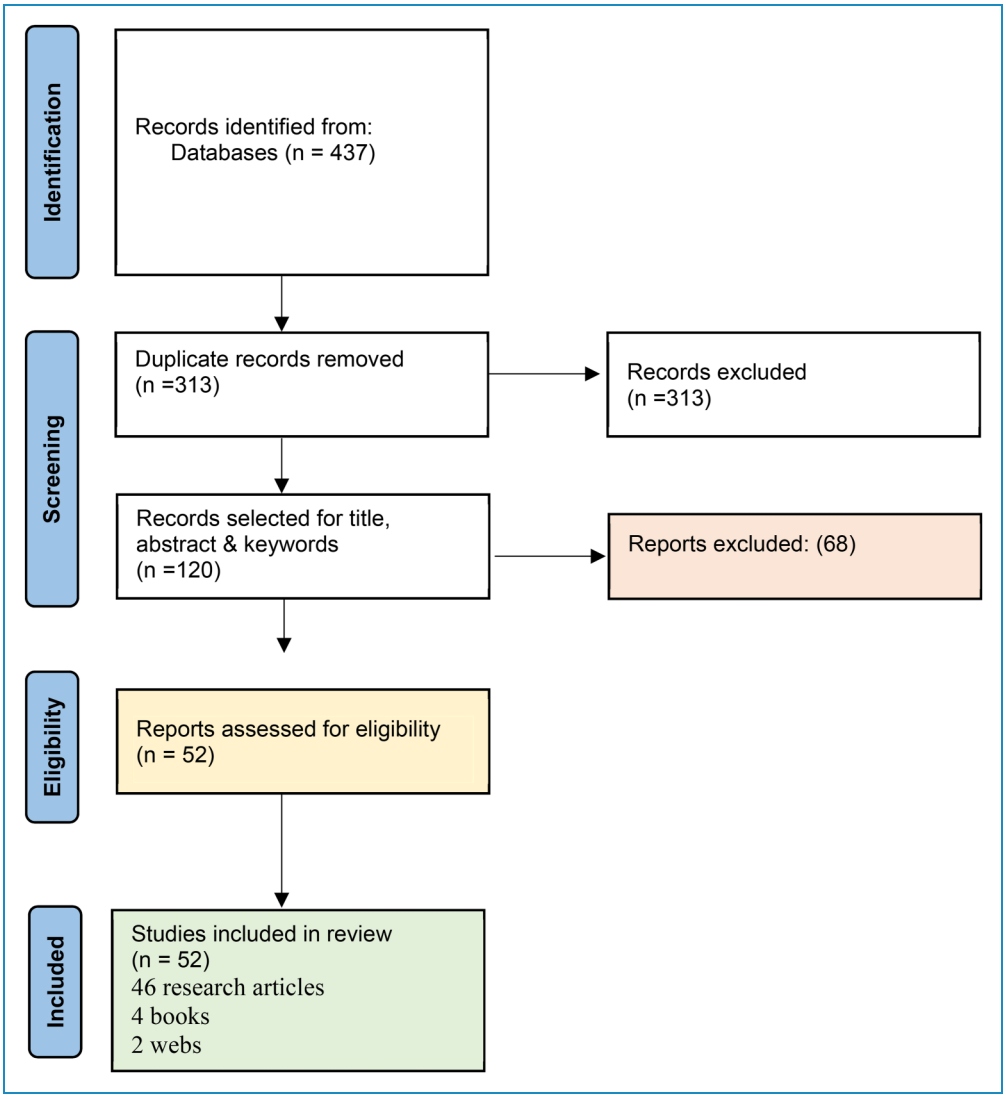


**Figure 2.** Searched sources for "digital empathy" concept analysis.

empathy through digital platforms, the critical role of digital literacy in telehealth, and the transformative impact of digital empathy on patient satisfaction, trust, and professional relationships in healthcare (see Figure 2).

## *Selecting a concept and determining its purpose*

The initial step of this concept analysis involved selecting the concept and defining its purpose.[15] Digital empathy was chosen due to its growing significance in modern nursing practice, particularly as telehealth becomes increasingly integral to healthcare delivery.[8,12] The reliance on digital communication platforms in nursing care underscores the need to understand how empathy—traditionally conveyed through face-to-face interactions—can be effectively adapted and expressed in virtual care settings.[9,17] This selection reflects the critical challenge of maintaining compassionate and meaningful communication in environments where traditional non-verbal cues, such as body language and physical presence, are limited.[7]

The purpose of this analysis is to explore and clarify the concept of digital empathy, providing theoretical and practical insights for its application in nursing. By examining the defining characteristics of digital empathy, the study seeks to distinguish it from related but distinct concepts, such as traditional empathy and digital communication skills. This differentiation is essential for developing actionable strategies that enable nurses to foster emotional connections with patients in digital healthcare environments.[11,18]

## *Identifying all the uses of the concept*

The definitions, theoretical foundations, and applications of the concept of digital empathy in healthcare and digital

communication can identify its uses.[15] Digital empathy finds its roots in two primary domains: empathy and digital communication. The term "empathy" is defined in the APA Dictionary of Psychology as the ability to understand a person from their frame of reference rather than one's own, or vicariously experiencing that person's feelings, perceptions, and thoughts. Also, previous authors refer to empathy as the ability to understand and share the feelings of another person, forming the cornerstone of patient-centered care.[19,20] Traditional nursing settings convey empathy through a combination of verbal and nonverbal cues, including tone of voice, body language, and facial expressions. However, the shift to digital communication platforms necessitates adapting these empathetic practices to virtual environments, where these cues are often limited or absent.[11]

Digital communication, on the other hand, emphasizes the use of technology to interact with patients. It requires proficiency in digital tools and the ability to adapt communication styles to suit virtual platforms, such as telehealth applications, chat-based consultations, and remote monitoring systems.[1,21,22] Integration of digital communication into healthcare has paved the way for digital empathy, enabling nurses to foster trust and build meaningful relationships with patients in virtual settings.[22,23]

Terry and Cain[8] defined digital empathy as the "traditional empathic characteristics expressed through computer-mediated communications." It represents the ability to convey understanding, compassion, and emotional support through digital platforms such as telehealth, video conferencing, secure messaging, and other forms of virtual communication.[8,18] The concept of digital empathy has gained significant attention in the context of telehealth, where maintaining emotional connections with patients is essential despite the absence of physical presence and traditional non-verbal cues.[11,17]

Digital empathy has applications beyond healthcare, including education, where it is used to enhance teacher–student interactions in online learning environments, and digital customer service, where empathy is employed to improve customer experiences in virtual interactions.[8,18] In nursing, digital empathy has been highlighted as a critical skill for ensuring patient satisfaction, improving treatment adherence, and maintaining the humanistic essence of care in telehealth settings. By bridging the gap between technology and compassion, digital empathy transforms traditional soft skills into indispensable tools for effective communication in digital healthcare environments.[9]

## Theories and models in digital empathy

Theoretical and conceptual frameworks provide essential guidance for understanding concepts and directing their application in research and practice.[15] Although digital empathy as a concept does not explicitly align with a singular theory, it draws from multiple models and frameworks in empathy, communication, and technology that inform its relevance in healthcare and telehealth.[8]

One of the foundational theories related to empathy is Carl Rogers' person-centered theory, which emphasizes the importance of genuine empathy in building trust and facilitating therapeutic relationships.[24] This theory underscores the role of emotional connection in effective communication and care, which remains central to the concept of digital empathy. In digital contexts, this principle translates into the ability to authentically convey compassion and understanding, even in the absence of physical presence.[24–26]

Another relevant framework for understanding digital empathy is Hojat's empathy model, which defines empathy in healthcare as a multidimensional construct encompassing cognitive, emotional, and behavioral components. These dimensions adapt to virtual platforms in the context of digital empathy. For instance, cognitive empathy involves understanding a patient's perspective through text or video interactions, while emotional empathy entails actively recognizing and responding to emotional cues in digital communications. The behavioral component, crucial in this model, refers to the actions taken in response to these understandings and feelings—such as adjusting communication style or providing tailored support through digital means. This adaptation ensures that empathy remains effective and impactful even in remote healthcare interactions.[20,27,28]

A related theory, digital empathy theory, proposed by Yoesoep Edhie Rachmad, examines how empathy can be effectively expressed through digital communication platforms, such as telehealth and video calls. The theory highlights that, while traditional empathy relies on face-to-face interactions and non-verbal cues, digital empathy requires emotional engagement, active listening, and responsiveness within virtual environments. It stresses the importance of adapting empathetic practices to overcome the limitations of digital communication, ensuring trust and meaningful connections in both professional and healthcare settings. This theory offers a framework for integrating empathy into digital interactions, ultimately improving patient outcomes and strengthening professional relationships.[29]

Also, the Four Pillars of Digital Empathy™, as outlined by Gonzalez[30] provide a framework for enhancing digital communication and engagement, particularly in digital health tools. The first pillar, Engage, emphasizes the need for responsiveness and reactivity to maintain attention, motivation, and activism. Entrust, the second pillar, concentrates on contextualizing and personalizing the communication, setting clear goals and confirming privacy and security. Encourage, the third pillar, aims to make the experience user-friendly by maintaining comfortable literacy and cognitive load levels. Lastly, Empower emphasizes creating a sense of safety and security, ensuring that

individuals feel heard and empowered in the process. By applying these four pillars, digital tools can overcome communication barriers and foster more meaningful engagement, resulting in higher response rates and more complete data collection.[30]

These theories and models collectively provide a foundation for understanding digital empathy as a multifaceted concept. They offer valuable insights into how empathy can be adapted and applied in digital healthcare environments, guiding the development of effective telehealth practices that prioritize compassionate, patient-centered care.[8]

## Results

### Defining attributes of digital empathy

Defining attributes are the essential characteristics of a concept that frequently appear in the literature, distinguishing it from related but distinct concepts.[15] For digital empathy, these attributes include authenticity and trust-building, communication effectiveness, emotional engagement, responsiveness, adaptability, technological proficiency, cultural sensitivity, and patient-centeredness. These attributes are derived from existing theories, models, and empirical studies related to empathy, digital communication, and telehealth practices.[7,8,11,29–31]

*Authenticity and trust-building:* Authenticity is a critical attribute of digital empathy, representing the nurse's ability to convey genuine care and concern through digital platforms. It involves sincerity in interactions, ensuring that patients feel valued and understood even when physical proximity is absent.[9,29] Authenticity builds trust and fosters meaningful connections, which are fundamental to patient-centered care in virtual settings. Patients need to feel that their privacy and security are assured and that their personal needs and circumstances are understood, encouraging them to engage in meaningful communication.[11] Trust-building is an integral part of authenticity, as establishing a reliable and supportive presence in digital interactions encourages continued engagement and confidence in the nurse's care.[32]

*Communication effectiveness* refers to the ability to convey clear, empathetic messages that resonate with patients in virtual care settings. Digital platforms tailor both verbal and non-verbal communication to make patients feel heard and understood, even in the absence of physical presence. Since face-to-face cues are limited, nurses must interpret digital cues such as tone, pace, and pauses in speech.[30,33]

*Emotional engagement* is the active recognition and response to patients' emotional states during digital interactions. It involves identifying cues such as tone of voice, word choice, or facial expressions in video consultations and responding empathetically to patients' needs.[17,30] This attribute ensures that patients feel emotionally supported, reducing feelings of isolation often associated with telehealth. By responding with genuine care and understanding, nurses can strengthen the emotional connection and alleviate distress during virtual care.[11]

*Responsiveness* refers to the nurse's ability to promptly and empathetically address patient concerns during digital interactions. It involves active listening and providing timely reassurance or guidance, which are essential for building trust in virtual care settings.[11] By responding quickly and empathetically to patient needs, nurses can reinforce a sense of safety and security, ensuring the patient feels understood and supported.[30] This also fosters trust and encourages patients to be more open in their virtual consultations.[32]

*Adaptability* reflects the nurse's ability to modify communication strategies to suit the limitations and opportunities of digital platforms. This includes tailoring verbal communication, managing technological barriers, and ensuring the effective use of visual or written cues to convey empathy.[11] Adaptability is particularly important in telehealth, where the context of interaction varies significantly from traditional face-to-face care. Adaptability allows nurses to modify their approach based on the unique circumstances of each telehealth scenario, overcoming the challenges posed by digital interactions. Nurses must continuously assess and adjust their approach to maintain engagement and ensure the communication resonates with patients despite the challenges of virtual settings.[11,30]

*Technological proficiency:* Technological or digital proficiency is a foundational attribute that enables nurses to effectively navigate digital platforms and utilize telehealth tools.[1] It involves not only technical skills but also an understanding of how to leverage technology to enhance empathetic communication.[31] Without technological proficiency, other attributes of digital empathy may not be fully realized. The ability to confidently use digital tools while ensuring smooth and uninterrupted communication helps foster a sense of security and trust in virtual healthcare environments.[29]

*Cultural sensitivity and patient-centeredness:* Cultural sensitivity refers to the nurse's awareness of cultural differences in communication, which is particularly important in telehealth, where patients may come from diverse backgrounds. Nurses need to be mindful of cultural nuances, such as differing expressions of emotions, body language, and attitudes toward authority, to ensure that empathy is conveyed in a culturally appropriate way.[33] This can be integrated with patient-centeredness, where the nurse ensures that care is personalized to individual's needs and respects their cultural context. A culturally sensitive approach helps patients feel understood and supported, promoting trust and fostering an environment where patients are more likely to engage openly with their healthcare provider.[33,34]

## Model and contrary case

Constructing a model or a contrary case aids in identifying the attributes of a concept. A model case illustrates the concept's presence, demonstrating the essential attributes, while a contrary case illustrates its absence, highlighting the consequences of lacking those key attributes.[15,16] The following model case shows the key defining attributes of digital empathy in telehealth nursing, while the contrary case illustrates the repercussions of not applying these attributes.

### Model case

In a telehealth follow-up session, Nurse Malak greeted Mr. Ali, a post-chemotherapy patient, with a genuine warm smile and maintained steady eye contact through the camera, instantly making him feel at ease and supported. As Mr. Ali described his ongoing nausea and fear of recurrence, Malak attentively nodded, giving him time to express his concerns fully without rushing him, making it clear she was fully present and engaged.

Sensing the distress in Mr. Ali's voice, Malak softly said, "I can see how challenging this must be for you; let's explore every option to make things more manageable." Her approach was both reassuring and collaborative, making Mr. Ali feel part of the decision-making process. During the consultation, Malak simplified her explanations about anti-nausea medications and dietary adjustments, ensuring that Mr. Ali could easily grasp the information despite his anxiety and discomfort. When he hesitated over a particular recommendation, Malak patiently discussed alternative treatments, respecting his concerns and adapting the care plan to suit his comfort level.

Throughout the session, Malak demonstrated her ease with the digital tools at her disposal, using the telehealth platform to share helpful resources directly on-screen and efficiently arrange for a home care nurse visit. This seamless integration of technology ensured that all information was readily accessible, and that additional support was arranged without any inconvenience to Mr. Ali.

By the end of the session, Mr. Ali felt truly heard and cared for, a reflection of Malak's ability to weave compassion and understanding into every interaction, ensuring that even through a screen, the connection felt personal and attentive…

### Contrary case

In another telehealth consultation, Nurse Hala initiated the session with a brief greeting, avoiding direct eye contact and appearing distracted. As Mrs. Alice began describing her persistent pain and fear of recurrence, Hala interjected with generic advice, such as, "You should try staying hydrated," without acknowledging the patient's concerns. Mrs. Alice hesitated, visibly unsettled, but Hala continued typing on their computer, failing to notice her discomfort.

When Mrs. Alice asked about next steps, Hala struggled with the telehealth platform, leading to several awkward silences. Instead of addressing the technical issue, they curtly stated, "Let's just focus on your pain for now," without offering reassurance. Hala concluded the session abruptly, offering no additional guidance or follow-up plans. Mrs. Alice logged off feeling confused and unsupported, doubting the quality of care she received.

*Feedback on the models:* The model case illustrates how digital empathy can transform telehealth interactions into meaningful, supportive experiences that enhance trust and patient satisfaction. In contrast, the contrary case demonstrates the detrimental effects of neglecting empathy in virtual care, leading to disconnection and dissatisfaction. These cases reinforce the importance of integrating digital empathy into telehealth nursing practices to ensure quality, patient-centered care.

*Borderline case.* A borderline case demonstrates the partial presence of the concept[15] where some attributes of digital empathy are present while others are lacking. This type of case can highlight the variability in practice and illustrate the importance of integrating all defining attributes for optimal outcomes.

In a telehealth session, Nurse Lara begins by warmly greeting Mr. Ahmed, a diabetic patient, and asks open-ended questions about his condition. She maintains steady eye contact and listens attentively, nodding to show understanding. However, when Mr. Ahmed shares his concerns about managing blood sugar during Ramadan, Lara provides factual dietary advice without acknowledging the emotional or cultural significance of his concerns.

Lara manages the telehealth platform well, sending Mr. Ahmed follow-up resources during the session, but her responses lack the depth of emotional engagement needed to address his underlying anxieties about fasting and his health. While Mr. Ahmed appreciates the practical advice, he leaves the session feeling somewhat unheard on a personal level.

*Comment*: This case reflects partial digital empathy. Lara demonstrates some authenticity and communication effectiveness, but her lack of emotional engagement limits the patient's overall experience. This highlights the need for nurses to fully integrate all attributes of digital empathy, including adaptability and emotional engagement, into telehealth interactions.

*Related case.* A related case explores a concept that shares some attributes with digital empathy but differs in key aspects.[15] For example, you could compare digital communication skills to digital empathy, emphasizing how empathy requires deeper emotional and interpersonal engagement beyond effective communication.

> In a telehealth interaction, Nurse Sami skillfully navigates the telehealth platform, clearly explains medical instructions, and ensures all technical issues are addressed promptly. While Sami's communication is clear and effective, they focus solely on relaying information without actively engaging with the patient's emotional needs. The patient feels well-informed but not emotionally supported.

*Comment*: This case reflects digital communication skills but not digital empathy. While Sami excels in providing clear information and managing technology, the absence of emotional engagement and authenticity differentiates digital communication from the broader concept of digital empathy.

## Antecedents of digital empathy

According to Walker and Avant's model, antecedents are conditions or events necessary before a concept can be realized or applied.[15] In the context of digital empathy, these antecedents include individual, contextual, and organizational factors that enable nurses to express empathy effectively in digital care settings. These factors form the essential foundation for the emergence of digital empathy. Personal and individual antecedents to digital empathy include the nurse's digital literacy, communication skills, emotional intelligence, adaptability, compassion, self-awareness, and professional decision-making power. Digital literacy is crucial for navigating telehealth platforms and utilizing digital tools effectively, ensuring smooth and efficient interactions with patients.[1,22] Communication skills, both verbal and non-verbal, are essential for conveying empathy through digital mediums, especially in settings where traditional cues such as body language and facial expressions are limited.[8,31] Emotional intelligence, as defined by Hojat et al., involves the ability to recognize and respond to emotional cues, a vital component of digital empathy.[20] It enables nurses to engage with patients empathetically, even when face-to-face communication is absent.[11]

Compassion enables individuals to recognize the suffering of others and motivates them to offer support, which is crucial in digital communication where emotional cues may be less apparent.[30,35] Self-awareness empowers individuals to understand their own emotional states and biases, which enhances their ability to respond empathetically to others.[11] Lastly, professional decision-making power which refers to the ability of nurses to make independent clinical judgments within their scope of practice plays a crucial role in fostering digital empathy. Nurses with this authority can assess patient needs, tailor communication strategies, and provide empathetic responses in virtual settings.[36] In telehealth environments, where non-verbal cues may be limited, decision-making autonomy enables nurses to adapt care approaches, personalize interactions, and address patient concerns in real time. Without this flexibility, empathetic engagement may be hindered by rigid protocols that limit individualized patient support.[13]

*Contextual and organizational antecedents:* Contextual factors include the nurse's prior experience with telehealth, a supportive work environment, and structured training programs. Nurses with previous exposure to telehealth platforms and virtual consultations are more adept at adapting their empathetic practices to digital contexts.[17,37] Supportive work environments provide access to necessary technology and foster a culture of patient-centered care, enabling nurses to focus on emotional connections despite the challenges of telehealth.[37] Training programs that address digital communication and emotional engagement equip nurses with the skills to integrate empathy into their virtual interactions.[38]

At the organizational level, antecedents include reliable digital infrastructure, clear telehealth policies, and professional development opportunities. Reliable technology ensures seamless communication between nurses and patients, mitigating technical disruptions that could hinder empathetic interactions.[17,23] Comprehensive telehealth policies establish best practices for maintaining empathy in virtual care. Additionally, professional development initiatives, such as workshops or certifications, empower nurses to refine their skills and enhance their ability to express empathy in telehealth settings.[8,39]

*Social and cultural antecedents:* Social and cultural factors, such as the patient's comfort with technology and cultural expectations regarding communication, influence the effectiveness of digital empathy. Nurses must be culturally competent and sensitive to diverse patient needs, adapting their communication styles accordingly.[11,40] Research emphasizes the importance of understanding cultural nuances to build trust and emotional connections in telehealth, particularly for patients from underserved or marginalized communities.[39]

## Consequences of digital empathy

In Walker and Avant's model, consequences refer to the outcomes that result from the application of a concept.[15] In the context of digital empathy, these consequences could manifest at multiple levels, impacting patients, nurses, and healthcare organizations. These outcomes could underscore the importance of digital empathy as a critical element in telehealth and virtual nursing practice.[8,11]

*For patients:* Empirical studies indicate that digital empathy enhances patient satisfaction and trust in telehealth settings. Patients who perceive empathy from their healthcare providers during virtual consultations report higher levels of satisfaction and are more likely to adhere to treatment plans, leading to improved health outcomes.[41] For example, a study analyzing text-based patient–provider interactions found that empathetic communication positively influenced patients' experiences in online clinics.[42] Additionally, empathetic telehealth interactions help bridge the emotional gap created by the lack of in-person communication, ensuring a positive patient experience even in digital care environments.[43]

*For nurses:* Demonstrating digital empathy not only enhances professional fulfillment but also plays a critical role in reducing burnout and improving job satisfaction. By establishing meaningful connections with patients in virtual settings, nurses can experience the emotional rewards of the profession, even when face-to-face interaction is not possible. This sense of connection helps strengthen the nurse–patient relationship, fostering trust and emotional support that enhances patient care and reinforces the value of nursing practice.[9,11] A study by Seuren et al.[41] emphasizes how demonstrating empathy boosts nurses' confidence and their sense of efficacy in their professional roles, making them feel more competent and engaged in their work. As telehealth continues to expand, the ability to express empathy digitally remains a fundamental skill that strengthens the therapeutic relationship and promotes positive outcomes for both patients and healthcare professionals.[11]

*For healthcare organizations:* At the organizational level, the integration of digital empathy into telehealth services leads to several positive outcomes. Patient retention and loyalty increase as empathetic interactions enhance the quality of care and overall patient satisfaction.[42,44] Organizations also benefit from improved care coordination and teamwork, as nurses who prioritize empathy foster a collaborative and supportive culture.[41,43] Furthermore, digital empathy could reduce staff turnover by enhancing nurse satisfaction and professional engagement, contributing to a more innovative and patient-centered organizational environment.[9]

The consequences of digital empathy highlight its value as a transformative element in telehealth nursing. By enhancing patient satisfaction, supporting nurses' well-being, and improving organizational outcomes, digital empathy reinforces the importance of maintaining compassionate communication in the increasingly digitalized healthcare environment.[8,11]

## Empirical referents of digital empathy

In Walker and Avant's model, empirical referents are defined as measurable indicators that demonstrate the presence of a concept in practice.[15] For digital empathy, these referents provide a foundation for operationalizing the concept in telehealth nursing by identifying observable behaviors and outcomes that reflect its presence. Rather than focusing on specific tools, empirical referents emphasize the measurable aspects of digital empathy itself, such as communication effectiveness, emotional engagement, and responsiveness in virtual care settings.[18]

For instance, *observable communication behaviors*, such as reflective listening, validation, and acknowledgment of patient concerns, are key empirical referents. These behaviors demonstrate the nurse's ability to establish a connection and convey understanding, even in the absence of physical cues.[2,7] *Patient feedback* serves as another crucial referent, highlighting perceptions of being understood, supported, and valued during telehealth interactions. Positive patient-reported experiences indicate the effective application of digital empathy.[11] *Engagement and responsiveness* are also vital empirical referents, observed through the timeliness and thoughtfulness of responses in digital communication. Nurses who actively engage with patients and tailor their responses to individual needs exemplify empathetic communication in virtual settings. Additionally, *emotional recognition* in digital interactions is a critical indicator of digital empathy. This involves identifying and responding to emotional cues conveyed through text, tone, or video, and adapting communication strategies to support and connect with patients.[11,17,30]

Several tools have been used to measure empathy referents in telehealth, each addressing different dimensions of digital communication.[45] The Jefferson Scale of Empathy (JSE) is a widely used instrument that evaluates healthcare providers' self-reported empathy levels, though it primarily focuses on traditional in-person interactions.[20] The Telehealth Usability Questionnaire (TUQ) measures the usability of telehealth systems, incorporating patient feedback on communication effectiveness and supportiveness in virtual care.[46] The Consultation and Relational Empathy measure assesses provider–patient relational dynamics, which has been adapted for digital consultations to evaluate emotional connection in telehealth encounters.[47] Additionally, artificial intelligence (AI)-driven video and text communication analysis tools can assess verbal tone, facial expressions, and sentiment in digital interactions, offering real-time feedback on the empathetic quality of provider communication.[39,41]

Despite the availability of these tools, current instruments primarily assess general empathy or usability rather than fully capturing the unique aspects of digital empathy. The absence of non-verbal cues, asynchronous communication challenges, and the evolving nature of digital interactions highlight gaps in measurement practices. This gap underscores the need for tailored instruments that integrate the unique aspects of digital empathy in nursing, ensuring its effective evaluation and application in virtual healthcare

settings. By emphasizing the identified referents and attributes, digital empathy can be effectively integrated, operationalized, and assessed within telehealth nursing. Future developments in AI and telehealth frameworks will further refine the ability to evaluate digital empathy, ensuring its effective integration into virtual healthcare practices.[8,11] Future research should prioritize the development of validated, culturally sensitive tools that comprehensively measure digital empathy across diverse healthcare settings, ensuring that telehealth continues to provide compassionate, patient-centered care.

In summary, the concept analysis of digital empathy in nursing, as summarized in Table 1, provides a comprehensive exploration of its attributes, antecedents, consequences, empirical referents, challenges, practical implications, and future research directions within telehealth settings. Key attributes of digital empathy include authenticity and trust-building, communication effectiveness, emotional engagement, timely responsiveness, technological proficiency, and adaptability, all of which are essential for fostering meaningful connections in virtual care. Antecedents span individual factors such as digital literacy, emotional intelligence, and self-awareness, alongside contextual and organizational elements like prior telehealth experience, supportive infrastructures, and professional development opportunities. Social and cultural

**Table 1.** Digital empathy concept analysis findings.

| Category | Findings |
|---|---|
| Attributes | *Authenticity and trust-building:* Conveying genuine care and building trust through digital interactions.<br>*Communication effectiveness:* Delivering clear, empathetic messages, considering digital cues like tone and pace. Clarity, active listening, and empathetic verbal interactions.<br>*Emotional engagement:* Establishing meaningful connections despite physical absence.<br>*Timely responsiveness:* Prompt and thoughtful communication in virtual care settings Adaptability: Ability to adjust empathetic behaviors to suit telehealth environments.<br>*Technological proficiency:* Seamless use of telehealth tools to enhance patient care.<br>*Cultural sensitivity and patient-centeredness:* Adapting communication strategies to be culturally sensitive and ensuring care is aligned with patient needs |
| Antecedents | *Individual and personal:* Digital literacy, communication skills, emotional intelligence, adaptability, compassion, self-awareness, professional decision-making power.<br>*Contextual and organizational antecedents:* Prior experience with telehealth, reliable digital infrastructure, clear telehealth policies, supportive environments and technological investments, professional development opportunities<br>*Social and cultural antecedents:* Patient's comfort with technology, cultural expectations regarding communication, cultural competence of the nurse |
| Consequences | *Patients:* Improved satisfaction, trust, adherence to treatment plans, and health outcomes.<br>*Nurses:* Enhanced job satisfaction, reduced burnout, and professional growth.<br>*Organizations:* Better team cohesion, reduced staff turnover, and increased patient retention. |
| Empirical referents | Measurable aspects of digital empathy such as communication effectiveness, emotional engagement, and responsiveness in virtual care settings. Tools: Jefferson Scale of Empathy (JSE) and Telehealth Usability Questionnaire (TUQ). Gap: The need for tailored instrument that integrates the unique aspects of digital empathy in nursing. |
| Challenges | Measurement: Lack of validated tools tailored to digital empathy.<br>Cultural variability: Different perceptions of empathy across diverse populations.<br>Technological limitations: Challenges in conveying non-verbal cues in certain formats. |
| Practical implications | *For nurses:* Training on emotional intelligence, digital communication, and adaptability.<br>*For organizations:* Investments in empathy-focused training programs and creating supportive environments.<br>*For patients:* Ensuring empathy-driven telehealth consultations to build trust and satisfaction. |
| Future research directions | Develop validated tools incorporating digital-specific attributes.<br>Conduct longitudinal studies on the impact of digital empathy on patient and nurse outcomes.<br>Explore cross-cultural expressions of digital empathy.<br>Leverage AI-based tools for real-time assessment and feedback on empathetic communication. |

considerations, including patients' comfort with technology and nurses' cultural competence, further underscore the importance of adapting digital empathy to diverse populations. The positive consequences of digital empathy are evident at multiple levels, improving patient satisfaction, trust, adherence to treatment plans, and health outcomes, while enhancing nurses' job satisfaction, reducing burnout, and fostering professional growth. Organizational benefits include better team cohesion, reduced staff turnover, and increased patient retention.

Empirical referents and measurement tools as JSE and the TUQ highlight existing tools but reveal gaps in measuring the unique aspects of digital empathy in nursing. Challenges such as the lack of validated tools, cultural variability, and technological limitations in conveying nonverbal cues present barriers to effective implementation. Practical implications emphasize the need for training nurses in emotional intelligence, digital communication, and adaptability, alongside organizational investments in empathy-focused programs and supportive environments to enhance care delivery. Future research should prioritize developing validated tools that incorporate digital-specific attributes, conducting longitudinal studies to assess the impact of digital empathy on patient and nurse outcomes, exploring cross-cultural expressions of empathy in telehealth, and leveraging AI-based tools for real-time feedback and assessment. This framework establishes a robust foundation for advancing digital empathy in nursing, addressing current challenges, and guiding future innovations in telehealth practices.

## Discussion

The concept of digital empathy, as revealed in this analysis, highlights its transformative role in telehealth nursing. Drawing from previous definitions and conceptualizations, we can define digital empathy in nursing as "a dynamic adaptation of empathy integrating technical proficiency and compassionate communication to address patient needs effectively in virtual care environments." By combining emotional engagement with technical skills, digital empathy enables nurses to foster trust, improve patient outcomes, and strengthen therapeutic relationships in telehealth settings.[20,30] This definition aligns with the attributes identified in the concept analysis, which include authenticity and trust-building, communication effectiveness, emotional engagement, timely responsiveness, adaptability, technological/digital proficiency, cultural sensitivity, and patient-centeredness. These attributes equip nurses to navigate the unique challenges posed by telehealth, such as the absence of physical presence and the limitations of digital platforms, while ensuring that patient-centered care remains a priority.[8,11] By adapting these skills to digital interactions, nurses can maintain a high standard of compassionate care, helping to bridge the emotional gap that can arise in virtual healthcare environments.[20,31]

### Linking conceptual findings to nursing practice

The attributes, antecedents, and consequences identified in this concept analysis could provide a comprehensive framework for integrating digital empathy into nursing practice. Adaptability ensures that nurses can adjust their empathetic behaviors to meet the unique demands of telehealth interactions, whether in text-based or video consultations. Emotional engagement and communication effectiveness allow nurses to build trust and foster meaningful connections with patients, even in the absence of physical presence. Furthermore, timely responsiveness and technological proficiency enable nurses to address patient needs promptly and effectively, ensuring that care delivery remains seamless. These attributes align closely with findings from previous studies, such as those by Terry and Cain, Sakumoto and Joshi, and Isidori et al. which highlight similar characteristics as essential for empathetic digital care in healthcare settings.[8,11,31]

These attributes are underpinned by essential antecedents, including digital literacy, emotional intelligence, and supportive organizational environments. These findings are supported by previous studies. For instance, Abou Hashish and Alnajjar[1] and Fitzpatrick[22] emphasized that nurses with strong digital literacy are better equipped to navigate telehealth platforms and utilize technology effectively to deliver care. Similarly, Hojat et al.[20] highlighted the importance of emotional intelligence in recognizing and responding to emotional cues in virtual settings, enabling nurses to maintain a compassionate approach even in the absence of face-to-face interaction. Furthermore, studies underscored the significance of supportive environments and technological investments in healthcare organizations.[17,46] These factors are instrumental in fostering a culture that prioritizes patient-centered care, allowing nurses to build emotional connections despite the inherent limitations of digital communication.

The consequences of digital empathy highlight its profound impact on patients, nurses, and healthcare organizations, as supported by recent studies. Seuren et al.[41] emphasized that patients benefit from enhanced satisfaction, trust, adherence to treatment plans, and improved health outcomes. Similarly, Subramanya et al.[48] demonstrated that empathetic communication, even in digital environments, correlates with better patient outcomes, such as improved treatment adherence and reduced hospital readmissions. Nurses, in turn, experience increased job satisfaction and opportunities for professional growth.[48] Additionally, organizations benefit from improved team cohesion, reduced staff turnover, and increased patient retention, fostering a positive and supportive work environment.[41–,44] Collectively, these findings underscore the critical role of digital empathy in cultivating a collaborative, patient-centered culture within nursing practice.

### Addressing challenges and gaps

Digital empathy, particularly in the context of telehealth and virtual care, necessitates reliable, validated tools to effectively assess its presence and impact.[18] Although several instruments have been developed or adapted to evaluate aspects of empathy in digital interactions—such as communication quality, emotional engagement, and patient satisfaction—significant gaps in measurement remain. Tools like JSE[20] and TUQ[46] provide valuable insights but require further refinement to capture the multifaceted nature of digital empathy. For instance, while the TUQ effectively assesses usability and communication quality, it falls short in evaluating emotional engagement or adaptability, which are critical attributes of digital empathy.

Additionally, cultural and contextual variability in how empathy is perceived poses a significant challenge in virtual care settings. Marcoux et al.[49] highlighted that patients from diverse cultural backgrounds may interpret verbal and non-verbal cues differently, influencing their perception of digital empathy. Similarly, Luetke Lanfer et al.[18] and Hilty et al.[50] revealed that linguistic differences and cultural norms significantly affect patients' trust and engagement in digital interactions. These findings underscore the necessity for measurement tools that incorporate cultural sensitivity and adaptability to accurately assess digital empathy.

Furthermore, technological limitations can hinder the full expression of digital empathy. For instance, Wanko Keutchafo et al.[51] noted that audio-only consultations lack visual non-verbal cues, making it more challenging for nurses to effectively convey emotional engagement. However, advancements in AI-based tools, such as sentiment analysis software, show promise in addressing this limitation. These tools can analyze tone, language, and even facial expressions in video consultations, providing real-time feedback on empathetic communication and improving the quality of virtual interactions. Such innovations, as highlighted by Seuren et al.[41] and Asif and Gouqing,[52] could help bridge the empathy gap in telehealth, ensuring that emotional engagement remains a central component of virtual patient care. Addressing measurement, technological, and cultural gaps is essential to improving the implementation and evaluation of digital empathy. Developing standardized, culturally sensitive tools can enhance telehealth services, foster equitable care, and improve patient outcomes.

### Limitations and implications for future research

While this concept analysis provides a foundational understanding of digital empathy in telehealth nursing, it is not without limitations. Concept analysis is inherently subjective, relying on the researchers' perspectives and interpretations, which may introduce bias into the results.[16] This underscores the need for empirical studies to validate and refine the identified attributes, antecedents, and consequences of digital empathy.

A key challenge is the lack of robust, validated tools specifically designed for measuring empirical referents and attributes of digital empathy. Developing comprehensive instruments that integrate these attributes is essential for advancing digital empathy in practice. The factors identified in this analysis—attributes, antecedents, and consequences—could serve as a basis for creating structured questionnaires to measure digital empathy in nursing practice. These tools could be further used to examine the relationship between digital empathy and key outcomes, providing evidence-based recommendations for training and development programs.

Future research should focus on longitudinal studies to assess the impact of digital empathy on patient outcomes, nurse well-being, and organizational performance. For instance, studies could investigate how digital empathy influences patient adherence to treatment plans or reduces nurse burnout in telehealth settings. Cross-cultural research is also essential to understand how empathy is perceived across different populations, ensuring that findings are broadly applicable.

Moreover, advancements in AI-based tools, such as sentiment analysis, show promise for improving digital empathy assessments. These tools could analyze tone, language, and patient engagement during telehealth interactions, helping nurses refine their communication strategies. However, these technologies must undergo rigorous testing for reliability and accuracy to ensure their effectiveness.[17,23,41] By addressing these limitations, future research can maximize the potential of digital empathy, enhancing its integration into telehealth and ultimately improving care delivery in the digital age.

## Conclusion and implications

As telehealth continues to evolve, digital empathy will play an essential role in shaping the future of nursing practice. Digital empathy, as outlined in this concept analysis, is a vital framework for advancing telehealth nursing practice. It effectively bridges the gap between traditional empathy and the unique demands of telehealth, equipping nurses with the necessary skills to deliver compassionate, effective care in virtual settings. This concept analysis provides a comprehensive understanding of digital empathy, emphasizing its defining attributes, antecedents, and consequences. By integrating these key components, nurses can enhance patient outcomes, improve professional satisfaction, and contribute to organizational success while promoting staff well-being and improving workplace dynamics.

However, to fully realize the potential of digital empathy, challenges such as measurement limitations,

cultural variability, and technological constraints must be addressed. Addressing the challenges identified in this analysis and advancing research will ensure that digital empathy is effectively integrated into telehealth, ultimately maximizing its potential to transform patient care in the digital age.

## Practical implications for nursing and healthcare organizations

This concept analysis highlights several actionable recommendations and implications for nursing practice, healthcare organizations, and policymakers to integrate digital empathy effectively into telehealth services.

*For nursing practice.* Nurses should adopt communication techniques such as reflective listening and empathetic affirmations to compensate for the absence of non-verbal cues in text-based or audio-only consultations. These strategies can enhance patient engagement and foster patient-centered care. Continuous professional development programs should focus on enhancing nurses' emotional intelligence, adaptability, and technological fluency to navigate telehealth complexities effectively.

*For healthcare organizations.* Institutions should invest in targeted training programs that combine emotional intelligence with technical skills, enabling nurses to deliver empathetic care in virtual settings. Organizations should create supportive environments that prioritize empathy, foster team collaboration, reduce staff turnover, and improve patient satisfaction. Developing and implementing standardized tools to measure and evaluate digital empathy is essential to ensure a comprehensive understanding of its impact on patient care.

*For policymakers.* Policymakers should establish guidelines and frameworks for integrating cultural sensitivity and adaptability into digital empathy practices, ensuring equitable care across diverse populations. Also, provide funding and incentives for research and development of advanced AI tools to support empathetic communication in telehealth, such as sentiment analysis software for real-time feedback.

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## References

1. Abou Hashish EA and Alnajjar H. Digital proficiency: assessing knowledge, attitudes, and skills in digital transformation, health literacy, and artificial intelligence among university nursing students. *BMC Med Educ* 2024; 24: 508.
2. Huter K, Krick T, Domhoff D, et al. Effectiveness of digital technologies to support nursing care: results of a scoping review. *J Multidiscip Healthc* 2020; 13: 1905–1926.
3. Monaghesh E and Hajizadeh A. The role of telehealth during the COVID-19 outbreak: a systematic review based on current evidence. *BMC Public Health* 2020; 20: 1193.
4. Bulto LN. The role of nurse-led telehealth interventions in bridging healthcare gaps and expanding access. *Nurs Open* 2024; 11: e2092.
5. McKinnon J. In their shoes: an ontological perspective on empathy in nursing practice. *J Clin Nurs* 2018; 27: 3882–3893.
6. Moudatsou M, Stavropoulou A, Philalithis A, et al. The role of empathy in health and social care professionals. *Healthcare (Basel)* 2020; 8: 26.
7. Babaii A, Mohammadi E and Sadooghiasl A. The meaning of empathetic nurse–patient communication: a qualitative study. *J Patient Exp* 2021; 8: 23743735211056432.
8. Terry C and Cain J. The emerging issue of digital empathy. *Am J Pharm Educ* 2016; 80: 58.
9. Ali S, Kleib M, Paul P, et al. Compassionate nursing care and the use of digital health technologies: a scoping review. *Int J Nurs Stud* 2022; 127: 104161.
10. Van Lotringen C, Lusi B, Westerhof GJ, et al. The role of compassionate technology in blended and digital mental health interventions: systematic scoping review. *JMIR Ment Health* 2023; 10: e42403.
11. Sakumoto M and Joshi A. Digital empathy 2.0: connecting with patients using the written word. *Telehealth Med Today* 2023; 8: 1–6.
12. Sakumoto M and Krug C. Digital empathy in telemedicine. *Telemed J* 2021; 18: 233–240.
13. Duffy LV, Evans R, Bennett V, et al. Therapeutic relational connection in telehealth: concept analysis. *J Med Internet Res* 2023; 25: e43303.
14. Petty J, Jarvis J and Thomas R. Exploring the impact of digital stories on empathic learning in neonatal nurse education. *Nurse Educ Pract* 2020; 48: 102853.

15. Walker LO and Avant KC. *Strategies for theory construction in nursing*. Boston: Pearson/Prentice Hall, 2011.
16. Abou Hashish EA. Neuroleadership: a concept analysis and implications for nursing. *J Neurosci Nurs* 2024; 56: 186–191.
17. Avery J and Pritchard D. Preserving empathy in a digital healthcare world. CipherHealth 2022, https://cipherhealth.com/blog/preserving-empathy-in-a-digital-healthcare-world/.
18. Luetke Lanfer H, Reifegerste D, Weber W, et al. Digital clinical empathy in a live chat: multiple findings from a formative qualitative study and usability tests. *BMC Health Serv Res* 2024; 24: 314.
19. Friesem Y. Empathy for the digital age: using video production to enhance social, emotional, and cognitive skills. In: *Emotions, technology, and behaviors*. Academic Press, 2016, pp. 21–45.
20. Hojat M, DeSantis J, Shannon SC, et al. The Jefferson Scale of Empathy: a nationwide study of measurement properties, underlying components, latent variable structure, and national norms in medical students. *Adv Health Sci Educ Theory Pract* 2018; 23: 899–920.
21. Morrow E, Zidaru T, Ross F, et al. Artificial intelligence technologies and compassion in healthcare: a systematic scoping review. *Front Psychol* 2023; 13: 971044.
22. Fitzpatrick PJ. Improving health literacy using the power of digital communications to achieve better health outcomes for patients and practitioners. *Front Digit Health* 2023; 5: 1264780.
23. Rony MK, Kayesh I, Bala SD, et al. Artificial intelligence in future nursing care: exploring perspectives of nursing professionals—a descriptive qualitative study. *Heliyon* 2024; 10: e25718.
24. Rogers CR. *On becoming a person: a therapist's view of psychotherapy*. Houghton Mifflin, 1961.
25. Mearns D and Thorne B. *Person-centered counseling in action* (3rd ed.). London: Sage, 2013.
26. Cavé J, Katjene M and Roos V. A scoping review of Rogers' person-centred approach to identify constructs relevant to optimal intergenerational relationships. *South Afr J Psychol* 2024; 54: 402–414.
27. Hojat M. *Empathy in patient care: antecedents, development, measurement, and outcomes*. New York: Springer Science & Business Media, 2009.
28. Hojat M, Louis DZ and Markham FW. Physicians' empathy and clinical outcomes for diabetic patients. *Acad Med* 2011; 86: 359–364.
29. Rachmad YE. Digital empathy theory. *Sparta Int Ed Books* 2017; 14: 1–129.
30. Gonzalez NM. A framework for designing digital health tools with empathy. *J Particip Med* 2017, https://participatorymedicine.org/journal/perspective/narratives/2017/02/17/a-framework-for-designing-digital-health-tools-with-empathy/.
31. Isidori V, Diamanti F, Gios L, et al. Digital technologies and the role of health care professionals: scoping review exploring nurses' skills in the digital era and in the light of the COVID-19 pandemic. *JMIR Nurs* 2022; 5: e37631.
32. Moore S, Ayers S and Visser RM. Patients' experiences of empathy and its impact on health outcomes. *Psychol Health* 2020; 35: 549–568.
33. Ruiz-Cosignani D, Chen Y, Cheung G, et al. Adaptation models, barriers, and facilitators for cultural safety in telepsychiatry: a systematic scoping review. *J Telemed Telecare* 2024; 30: 466–474.
34. Gabay G, Ornoy H and Moskowitz H. Patient-centered care in telemedicine—an experimental-design study. *Int J Med Inform* 2022; 159: 104672.
35. Abou Hashish EA and Atalla AD. The relationship between coping strategies, compassion satisfaction, and compassion fatigue during the COVID-19 pandemic. *SAGE Open Nurs* 2023; 9:23779608231160463.
36. Fuller M, Kamans E, van Vuuren M, et al. Conceptualizing empathy competence: a professional communication perspective. *J Bus Tech Commun* 2021; 35: 333–368.
37. Al Baalharith I, Al Sherim M, Almutairi SHG, et al. Telehealth and transformation of nursing care in Saudi Arabia: a systematic review. *Int J Telemed Appl* 2022; 2022: 1–12.
38. Strekalova YA, Krieger JL, Kleinheksel AJ, et al. Empathic communication in virtual education for nursing students: I'm sorry to hear that. *Nurse Educ* 2017; 42: 18–22.
39. David-Olawade AC, Olawade DB, Ojo IO, et al. Nursing in the digital age: harnessing telemedicine for enhanced patient care. *Inform Health* 2024; 1: 100–110.
40. Alkhamees M, Lea J, Islam MS, et al. A qualitative investigation of factors affecting Saudi patients' communication experience with non-Saudi physicians in Saudi Arabia. *Healthcare (Basel)* 2022; 11: 18.
41. Seuren LM, Ilomäki S, Dalmaijer E, et al. Communication in telehealth: a state-of-the-art literature review of conversation-analytic research. *Res Lang Soc Interact* 2024; 57: 73–90.
42. Ramachandran M, Brinton C, Wiljer D, et al. The impact of eHealth on relationships and trust in primary care: a review of reviews. *BMC Prim Care* 2023; 24: 28.
43. Budd G, Griffiths D, Howick J, et al. Empathy in patient–clinician interactions when using telecommunication: a rapid review of the evidence. *PEC Innov* 2022; 1: 100065.
44. Ezeamii VC, Okobi OE, Wambai-Sani H, et al. Revolutionizing healthcare: how telemedicine is improving patient outcomes and expanding access to care. *Cureus* 2024; 16: e63881.
45. Collins AM, Warburton WA, Bussey K, et al. Factor structure and psychometric properties of the digital communication empathy scale (DCES). *Int J Hum Comput Stud* 2024; 183: 103183.
46. Parmanto B, Lewis AN, Graham KM, et al. Development of the Telehealth Usability Questionnaire (TUQ). *Int J Telerehabil* 2016; 8: 3–10.
47. Mercer SW and Reynolds WJ. Empathy and quality of care. *Br J Gen Pract* 2002; 52: S9–S12.
48. Subramanya V, Spychalski J, Coats S, et al. Empathetic communication in telemedicine: a pilot study. *PRiMER* 2024; 8: 36.
49. Marcoux A, Tessier MH and Jackson PL. Nonverbal behaviors perceived as most empathic in a simulated medical context. *Comput Hum Behav* 2024; 157: 108268.
50. Hilty DM, Gentry MT, McKean AJ, et al. Telehealth for rural diverse populations: telebehavioral and cultural competencies, clinical outcomes, and administrative approaches. *mHealth* 2020; 6: 20.
51. Wanko Keutchafo EL, Kerr J and Baloyi OB. A model for effective nonverbal communication between nurses and older patients: a grounded theory inquiry. *Healthcare (Basel)* 2022; 10: 2119.
52. Asif M and Gouqing Z. Innovative application of artificial intelligence in a multi-dimensional communication research analysis: a critical review. *Discov Artif Intell* 2024; 4: 1–30.