

# Digital health: A concept analysis using the Walker and Avant framework

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**Key Words:** *Digital health; Nursing technology; Digital nursing*

## Abstract

**Objectives:** This concept analysis explores the concept of Digital health (DH) in relation to contemporary nursing practice to enable a shared language and avoid confusion around terminologies. **Design:** A concept analysis was undertaken using Walker and Avant's framework. **Data Sources:** Database searches were completed using CINAHL Ultimate with the criteria to include peer reviewed papers written in English with full text availability dated from 2015 to retrieve up to date papers. **Review methods:** A concept analysis was undertaken to define the concept of DH and identify key characteristics. **Results:** The concept of DH emerged as an umbrella term that encapsulated multiple sub-terms linked to the delivery of health care using technology. **Conclusion:** DH has implications for nurses linked to ethical and safe use within patient care with increasing accountability for professionals. DH has the potential to improve patient outcomes and requires ongoing development to ensure staff and patient education is optimised. This concept emerged as an umbrella term that offers opportunity as a construct to link related technologies.

## Introduction

Digital health (DH) has emerged as a pivotal force reshaping healthcare delivery in the era of rapid technological advancement (Orton et al., 2018). It encompasses a wide array of technologies, from Electronic Health Records (EHRs) and telehealth to wearable devices and personalised medicine, aiming to enhance the efficiency of healthcare services, improve patient outcomes, and facilitate a more personalised approach to care (Shaw et al., 2020). As healthcare becomes increasingly intertwined with digital innovation, these technologies are integral to expanding access, improving the quality of healthcare services, and empowering patients and pro-

viders with better health management tools (Chu et al., 2018).

The potential for improved patient self-care and increased autonomy through utilising DH has long been recognised (Lupton, 2013), analysing DH through the nursing lens is timely and crucial. Nurses stand at the forefront of healthcare delivery, necessitating an intimate understanding of DH to adapt and thrive in this evolving landscape (Troncoso & Breads, 2021). Advances in technology mean artificial intelligence, digital nursing documentation and robotics are becoming commonplace within healthcare practice. Despite this growing presence there are also concerns that DH may invite a growing divide in the therapeutic relationship as technology influences how nurses interact with patients (Ali et al., 2022).

Whilst there may be cultural variations of the acceptance of technologies there is global concern that the physical distance between patient and nurse may widen because of increased uses of DH (Wynn, 2024). The World Health Organisation (WHO) identify that DH necessitates a change in behaviour for healthcare staff and can only succeed if action is taken to implement and accept new practices (WHO, 2021). Nursing staff readiness to adopt health technologies has been discussed within recent literature internationally highlighting the concerns around confidence, resistance, and impact to workload (Alrasheeday et al., 2023; Madhuwanthi et al., 2022; Salameh et al., 2019). However, digital empathy has been identified as a strategy that nurses can adopt to communicate with patients and bridge the gap between technology and real-world interactions (Hashish, 2025), in contrast other studies recognise nurses' positivity about DH (Martinez et al., 2023). The integration of DH into contemporary healthcare outside of direct patient care is seen where complex data in research studies can be achieved, which also enhance patient care (Di et al.,

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2022) this also reinforces the need for a clear concept definition that can be applied across disciplines.

A preliminary search was undertaken to establish the relevance of this concept analysis within contemporary literature. DH has been explored within concept analysis enquiries with a focus on DH literacy (Ban et al., 2024), DH equity (Razaq & Allana, 2025), DH leadership (Laukka et al., 2022), and DH nursing quality management (Han et al., 2023). These papers explored wider contextual factors as opposed to the concept of DH in isolation which affirms the value of achieving conceptual clarity within this concept analysis.

There are noted inconsistencies and interchangeable use of the concept of DH such as eHealth, telehealth and health technology seen within available literature. The need for conceptual clarity means a clearer dialogue between professionals is possible and helps nurses to apply the concept of DH consistently. It has been recognised that a lack of a clear definition of the term DH means that over 96 definitions were seen that related to using technology to improve the health and well-being of people (Fatehi et al., 2020). Burrell et al. (2022), cautioned that umbrella terms are used generally within the literature in respect to DH which means ambiguity can result which may affect outcomes in patient care.

## Significance of the concept

DH is an evolving concept that broadly applies information and communication technologies to healthcare. It encompasses many practices, including wearable devices, mobile health applications, telehealth, health information technology, and telemedicine, aiming to manage illnesses and health risks and promote overall wellness (Shaw et al., 2020). This captures the essence of DH as not just the implementation of technological solutions, but also their role in improving the well-being of individuals and populations (Kostkova, 2015). DH closely integrates with other emerging areas such as mobile health (mHealth), telehealth, eHealth, and the application of artificial intelligence in healthcare. The literature indicates that the focus is on providing healthcare services rather than technology (Chan, 2021). The objective is to surpass traditional healthcare systems, patient care, and health data utilisation.

## Data Sources

A targeted review of the literature was undertaken to identify how the concept of DH is defined and used across nursing literature.

## Search strategy

A comprehensive search via CINAHL Ultimate database to target papers focussed on defining terms of reference for DH was completed. The following search string was used: (“digital health” OR eHealth OR “electronic health”

OR telehealth OR telemedicine OR mHealth OR “health technology”) AND (definition\* OR concept\* OR meaning OR terminology OR “conceptual framework” OR scope). Limiters used were full text availability dated from January 2015 to December 2025, this was to ensure relevant papers were identified as terminology changes frequently within this field. Papers written in English and peer reviewed focussed on human populations were searched for identifying 2055 hits. A second search was undertaken to scope further using the search string ‘Digital and health’ and definition or define or meaning or description (in title). The same limiters were applied gleaning 49 hits; one was relevant which was a duplicate from the first search. Finally n=10 research studies were found (see *Figure 1: Prisma flow diagram and Table 1: Screened papers*).

## Ambiguity in the use of the concept

The most notable theme identified within the literature is the considerable ambiguity surrounding the concept of DH and the terminology associated with it. Multiple authors identify the absence of universally agreed definitions for DH and its related concepts (Fatehi et al., 2020; Harvard et al., 2024; Weinert et al., 2022). Harvard et al. (2024) further emphasise this lack of conceptual clarity by noting that DH is often used as an umbrella term encompassing almost any healthcare practice involving technology. This broad usage highlights both the conceptual ambiguity and the prolific nature of the term across healthcare literature and the various subcategories it is also applied to.

Similarly, Boni and Tieppo (2022) describe DH as widely used but that it is an inconsistently applied concept that covers a broad range of healthcare practices using technology. They argue that such inconsistency is compounded by the increasing number of niches within telehealth, each introducing additional layers of terminology and conceptual overlap. Weinert (2022) supports this observation, identifying a wide range of terms and definitions used to describe DH and demonstrating considerable variability in how these terms are interpreted and applied across studies. Sousa et al. (2022) also note a degree of duality and inconsistency within the literature, reflecting the challenge in currently finding standardisation of DH terminology.

Sousa et al. (2022) further identify that terms to describe DH evolve as the technology itself evolves. As Seckman and Van de Castle (2020) state, DH refers to a variety of information and communication technologies used in care, a continuous emergence of new technologies could be a catalyst for ongoing ambiguity. As standardised terminologies improve patient outcomes, it becomes paramount to understand this concept with clarity in the nursing field (Bertocchi et al., 2025).

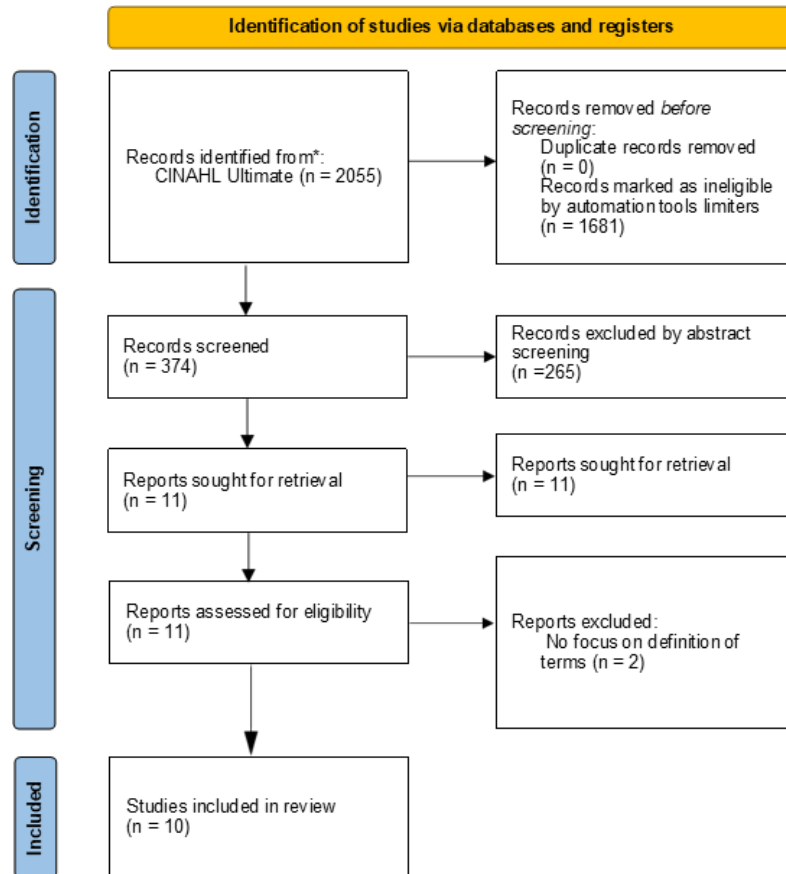


Figure 1. PRISMA flow diagram (PRISMA Executive, n.d.).

### Ethical considerations

Data security and trust issues are identified as being more prominent with the increasing use of technology, especially since the introduction of artificial intelligence within healthcare (Dunlap & Michalowski, 2024). Young Yanes et al. (2024) identify how risks in data collection and privacy mean healthcare professionals need to ensure it is implemented in such a way that aligns with ethical values. Hence, responsibility is passed to healthcare professionals to challenge the way DH is implemented (Young Yanes et al., 2024). The ethical responsibility being passed to healthcare professionals is also noted by Wynn et al. (2023) who state nurses must consider the ethical challenges of DH, and Fatehi et al. (2020) who emphasise the proper use of technology must be observed to improve health. Although nurses are registered professionals the responsibility for ethical implementation of systems may increase their overall accountability and should align with clearly defined roles, which nurses should be adequately supported with (Meier et al., 2025).

Healthcare staff’s responsibility to ensure appropriate use of DH for patients is echoed in the patient’s requirement to absorb more responsibility, for example in recording their own data. Responsibility is also passed to patients with DH, where it is stated there must be a willingness to share personal data where there are also data risks (Wynn et al., 2023). However, it is argued that DH can enable increased autonomy for patients, there is also

a concern that losing control over data access and storage is disempowering (Nickel et al., 2023). It is therefore pertinent to note that although DH can encourage collaborative healthcare improving patient involvement there are also ethical considerations for nurses to incorporate into their practice relating to DH (Silven et al., 2022).

### Advancement of nursing practice through digital health

Within the literature review DH is consistently linked to the advancement of nursing practice. Sousa et al. (2022) describe telehealth as a form of distance care. This introduces new ways for nurses to deliver patient care within digital environments and identifies the core focus of nursing practice being carative. Noted generally positive attitudes from nurses towards digital forms of practice; Harvard et al. (2024) report that nurses responded positively to the integration of digital nursing within their roles.

Wynn et al. (2023) suggested that nurses used technology to support their understanding of patients, this suggests that DH can complement a holistic approach. Other studies link nurses understanding of DH to patient outcomes. Bonni and Tieppo (2022) found that nurses’ interpretations of DH concepts directly influenced how they assessed and supported patients. Similarly, Seckman and Van de Castle (2020) identify DH as encompassing a broad range of information and communication technologies used in care, highlighting the expanding scope

**Table 1.** Screened papers

The papers included in the literature review were analysed and some common themes were identified in relation to the term DH.

Author / Title	Type of study	Relevant data
Bertocchi et al. (2025)	Secondary analysis of systematic review	Standardised nursing terminologies improve patient and organisational outcomes Standardised terminology integrated into HER supports quality improvement Enables identification of nursing contribution to patient centred care
Boni and Tieppo (2022)	Concept analysis telehealth	Widely used concept to describe various technology practices and not always used interchangeably Niches within telehealth Nurses understanding of DH related to patient outcomes
Fatehi et al. (2020)		No agreed upon definition of DH – ambiguity Emphasises proper use of technology to improve health As technology evolves so does the use of terms
Harvard et al. (2024)	Definition	No standard definition of digital nursing and term used broadly to anything that includes technology Nurses responded positively about digital nursing
Jose et al. (2024)	Observational implementation study	Not relevant
Seckman and Van de castle (2020)	Descriptive evaluation	DH refers to a variety of information and communication technologies used in care
Sousa et al. (2022)	Concept Analysis	Telenursing – a form of distance care and use of telephone Identified duality of terms used in literature information and communication in nursing care through use of technology to meet health needs
Wienert et al. (2022)	Definition of digital public health interventions	Heterogeneity of how such terms interrelate Multitude of terms and definitions in digital health
Wynn et al. (2023)	A scoping review and thematic analysis	Use of technology as an expression of caring Nurse interactions with technology to achieve knowing of patients Cultural shifts and willingness to share personal data & data / risks Ethical challenges nurses must consider No focus on definition
Young Yanes et al. (2024)	Theoretical philosophy	DH broad field DH brings technological advances but risks in data collection and privacy – Foucauldian perspective; users need to challenge the ways in which DH implemented to align with ethical values

of digital competence required in nursing. Bertocchi et al. (2025) expanded and argued standardised terminologies help make the nursing contributions to care more visible and promote the profession within the multidisciplinary team. Overall, these studies suggest that DH is reshaping nursing practice by broadening methods of care delivery, strengthening evidence based decision making, and making nursing work more visible within healthcare systems.

In summary the literature review identifies that there is ambiguity around the concept of DH which causes significant risk of miscommunication within patient care environments. The emergence of this concept as an umbrella term is evident in the varied and far-reaching examples of health care DH is applied to within the literature. The responsibility for risk considerations and ethical application of DH within care was evident and the relevance to professional practice was explicit. DH has the potential to enable advancements including increased visibility of nursing practice and provide the basis for improved autonomy and holistic care for various patient populations.

### Walker and Avant

This concept analysis adopts a methodological framework based on the eight-step process defined by Walker and Avant (2011). This framework offers a systematic

methodology for analysing and comprehending intricate concepts within the nursing field (Kirkpatrick et al., 2017). The Walker and Avant method details a structured approach, starting with selecting the idea and culminating in identifying empirical referents. The method's step-by-step strategy provides a comprehensive roadmap for systematically investigating concepts. The Walker and Avant framework was chosen for its rigorous and structured framework, which is conducive to exploring the multifaceted nature of DH (Laukka et al., 2022). It allows for a comprehensive examination of the concept as it applies to nursing, ensuring a thorough understanding essential for integrating DH effectively into nursing practice and education (Franco-Tantuico, 2021).

### Defining attributes

Defining attributes are the characteristics most frequently associated with a concept and help distinguish it from others (Castleberry, 2018). This stage of the concept analysis enables this concept to be separated from others (Shaw et al., 2025). For DH, the defining attributes include:

**Technology utilisation:** Central to DH are advanced technologies, encompassing a broad spectrum of tools such as electronic health records (EHR's), telemedicine platforms, wearable health monitors, mobile health apps,

and artificial intelligence. These technologies facilitate acquiring, managing, and utilising health-related data (Cowie et al., 2016). These tools help healthcare professionals make informed decisions, monitor patient health in real-time, and deliver remote care, improving healthcare access (Jeddi & Bohr, 2020).

**Interconnectivity:** One critical characteristic of DH is its interconnectivity, which is the ability to exchange health-related data smoothly between various digital platforms. Such interconnectivity links patients, healthcare providers, and health systems. It supports a complete approach to health management, including diagnosing, treating, and providing long-term care without being limited by physical distances (Shaw et al., 2020).

**Data-driven:** DH is data-driven, distinguished by its ability to gather, analyse, and apply data effectively. This approach promotes practices based on solid evidence and enhances informed decision-making, advancing health research and managing population health (Machluf et al., 2017).

**Patient Engagement:** DH actively involves patients in their care, encouraging them to manage their health through digital means such as patient portals and health applications (Irrizary et al., 2015). However, this does not include all elements of DH as professionals may employ DH without patient participation for example documentation within clinical practice.

**Accessibility:** DH offers access to health information and services through digital means, making healthcare more accessible to patients regardless of location or mobility where access to technology is available (Hollis et al., 2015).

In nursing, these attributes of DH are integral to the profession's evolution, as they equip nurses with tools to improve patient care, enhance their clinical practice, and adapt to the changing healthcare environment (Schultz, 2023).

## Selection of the concept

For nursing, the relevance of DH is profound and multifaceted. It provides nurses with access to real-time patient data, which can improve monitoring accuracy and make care more responsive (Hollis et al., 2015). Kuwabara et al. (2019) discuss how DH tools can assist in patient education, support self-management of health and illness, and enhance communication between patients and healthcare providers. They also offer new professional development and continuing education avenues through e-learning platforms and simulation (McBride et al., 2020). DH represents a shift towards a more data-driven, patient-centred healthcare model, where technology augments the nurse's role in delivering care (Risling & Risling, 2020). Nurses must leverage digital tools to improve care, serving as the primary contact for patients.

Analysing this concept is critical for nursing practice's current and future landscape.

Determining the purpose of analysis

This study aims to clarify the concept of DH using Walker and Avant's method of concept analysis, providing clarity into its application in nursing. This concept analysis aims to enable a shared understanding and highlight the significance of DH for nursing practice. Understanding shared by professionals enables consistency in the application into patient care to ensure ethical use to promote holistic care.

## Identifying all uses of the concept

Understanding the uses of this concept assists nurses to understand the widespread use within healthcare currently as the utility of DH is extensive and dynamic. Key uses include managing patient records through EHRs, which streamlines the sharing of patient information across different healthcare settings, enhancing continuity of care (Clarke et al., 2018). Telehealth services, a cornerstone of DH, facilitate remote consultations and monitoring, thereby expanding access to healthcare services, particularly in rural or underserved regions (Bradford et al., 2016). Mobile health apps empower patients to manage their health more actively by tracking vital statistics and medication adherence, fostering a participatory approach to healthcare (Mahmood et al., 2019).

DH technologies support nursing practice by enabling tailored patient education, providing real time insights through wearable monitoring, and enhancing clinical decision making (Kuwabara et al., 2019; Weenk et al., 2019). They also assist nurses in research, improving patient safety via decision support systems, and supporting ongoing professional development through online learning and virtual simulation (Kononowicz et al., 2019).

## Examples of cases

### Model case

Maria is a 68-year-old patient with type 2 diabetes and hypertension, living in a remote rural area with internet access and a working mobile phone that allows access to log into her healthcare digital programme. Her healthcare provider implemented a comprehensive DH program to enhance patient care and engagement. This program includes a wearable device that monitors her glucose levels and blood pressure in real-time, transmitting data directly to her EHR, accessible by her healthcare team. Additionally, Maria uses a patient portal, an integral component of the DH program, to view her health data, schedule appointments, and communicate with her healthcare providers. This portal facilitates active patient engagement, empowering Maria to manage her conditions proactively and increases her autonomy in managing her condition.

Her healthcare team employs a Clinical Decision Sup-

port System (CDSS) that analyses the data from Maria's wearable device alongside her EHR. This system alerts her healthcare provider if her readings deviate from the established parameters, enabling timely intervention. Furthermore, the team conducts regular telehealth sessions with Maria, discussing her condition, medication adjustments, and lifestyle recommendations, ensuring continuous care despite the geographical barriers.

This case exemplifies the critical attributes of DH: technology utilisation through wearables and EHRs, patient engagement via the patient portal, effective data management through real-time monitoring and CDSS, and interconnectivity between Maria, her healthcare team and the technologies they use. Maria's case demonstrates how DH can transform patient care, particularly for those in remote areas, by improving access to healthcare services, enhancing the management of chronic conditions, and fostering a collaborative care environment.

### Contrary case

John is a 55-year-old patient with chronic obstructive pulmonary disease (COPD) who receives care in a healthcare setting that has yet to adopt DH practices. His medical records are kept in paper format, requiring manual retrieval and review by his healthcare team during each visit. This traditional approach to health records management lacks the efficiency and accessibility of EHRs, leading to increased time spent on administrative tasks and a higher risk of errors in health information. Communication between John and his healthcare providers is limited to in-person visits and occasional phone calls. There is no patient portal for him to access his medical information, schedule appointments, or communicate with his healthcare team outside of these visits. This lack of digital engagement tools prevents John from actively participating in his care management and limits his access to his health information.

Furthermore, John does not use wearable devices or remote monitoring technologies to track his health parameters. His COPD management relies solely on self-reported symptoms and sporadic measurements taken during office visits. This absence of continuous monitoring and data management capabilities hinders the proactive management of his condition. In this scenario, the critical attributes of DH technology utilisation, patient engagement, effective data management, and interconnectivity are absent. Environments where DH technologies facilitate enhanced access, efficiency, and patient-centred care stand in clear contrast to John's case, which lacks these attributes and illustrates a healthcare experience that is not integrated or proactive.

### Borderline case

Alex, a nurse in a community clinic, assesses patients using an essential digital thermometer and blood pressure monitor. While these devices digitally record vital

signs and are visible to the patients, the other means of DH employed include the recording of patient notes within an EHR system that the clinic has introduced. This system enables more proficient communication to occur between professionals and reduces the likelihood of patients needing to repeat information. However, there are no current uses of apps that engage patients with their healthcare or provide access to records or results. More expansion in the use of technology is needed to fully embody the concept of DH due to integration with other DH technologies, such as Telehealth platforms. This case borders on the idea because it involves digital tools but lacks a comprehensive, interconnected approach to DH.

### Antecedents

Antecedents are components that come before the occurrence of the concept and are related to the concept (Toftthagen & Fagerstrom, 2010). For DH foundational elements must be in place and are identified as antecedents:

1. Technological infrastructure, including internet access and digital devices, must be reliable (Sieck et al., 2021).
2. Healthcare professionals and patients need practical digital literacy skills to use and benefit from DH technologies (Dunn & Hazzard, 2019).
3. Regulatory frameworks and policies should support using and sharing of DH information while ensuring patient privacy and data security (Zhu et al., 2020)
4. A culture of innovation within healthcare organisations is essential to foster the adoption and integration of DH solutions (Velthoven & Cordon, 2018).
5. Staff trained in ethical use of DH and who are also able to educate patients to engage with the relevant technologies for their care.

### Consequences

Consequences are identified as the factors that result from the concept occurring (Fitzpatrick & McCarthy, 2016). The adoption of DH leads to a range of outcomes. For healthcare providers, it results in improved access to patient data and decision-support tools, enhancing the quality of care (Wani & Malhotra, 2018). Patients experience greater engagement in their health management through access to their health information and DH tools leading to increased autonomy (de Fatima Marin et al., 2017). There's also an increase in the efficiency of healthcare delivery, with reduced administrative burdens and enhanced communication among care teams (Orton et al., 2018). However, it may also lead to challenges, such as the need for ongoing training for both staff and patients and potential data privacy and security issues which involves ethical considerations by staff (Vayena et al., 2018). Implementing DH transforms healthcare practices, making them more patient-centred, data-driven,

and efficient (Gopal et al., 2018).

## Empirical referents

Empirical referents in the context of DH are observable measures or indicators demonstrating the concept's presence and effectiveness in practice. These include the extent of EHR adoption across healthcare facilities, the frequency of telehealth consultations, the use of mobile health applications by patients, and the integration of wearable health devices into patient care plans. Additionally, patient satisfaction scores related to DH services, such as ease of access to online health information and communication with healthcare providers through digital platforms, serve as important indicators. The volume of data processed and analysed through health informatics tools for decision-making and patient care optimisation also reflects DH implementation. These referents are crucial for evaluating the tangible outcomes of DH initiatives and their impact on improving healthcare delivery and patient outcomes.

## Discussion

Throughout the literature review, ambiguity surrounding the concept of DH emerged repeatedly as a significant concern. This lack of clarity has the potential to negatively affect patient care, for example causing delays in clinical decision making, leading to adverse outcomes (Stallinga et al., 2014). Clarity in terms can enable staff to use unambiguous language to improve communication and has also been found to improve quality by increasing the use of evidence-based care (Zhang et al., 2021). This supports the value of undertaking this concept analysis to develop shared language within nursing teams.

The use of DH has expanded rapidly in recent years, particularly with the growing integration of artificial intelligence into healthcare (Abernethy et al., 2022). Analysis of the literature indicates that DH functions as an umbrella term encompassing a range of technological elements related to health and patient care. As an umbrella term, it incorporates multiple components and subsections, also with varied terminology and interpretations seen across the literature, the potential for confusion is evident. Burrell et al. (2022) suggests a functional classification system is required to identify DH technologies especially as there is an overlap in use of terms noted.

Nurses carry responsibility for ensuring that patients are adequately informed and supported when engaging with DH, whilst maintaining their own competence in response to evolving technologies regardless of the practice setting (Ali et al., 2022). Needing to understand the terms used within this umbrella term, DH emerges as a complex ongoing endeavour. Ethical considerations extend from professional accountability issues for nurses to the expectation that they should be proficient and able to use technology (Fotis, 2021). Potential risk within DH and expectations for nurses' digital competence

highlight the moveable boundaries within the nursing role especially where emerging technologies are introduced (Isidori et al., 2022). The United Kingdom Government has acknowledged the need for technology to meet the safety needs for staff and patients (Anderson 2025), furthermore the Nursing and Midwifery Council (NMC) recognise that more clearer standards on DH are required (NMC, 2025).

The impact of nursing voices is described as 'missing' despite being the end users of digital technologies in health, which reinforces the complicated dynamics for nurses in DH (Troncoso & Breads, 2021). Given the longstanding perception of nurses as occupying a lower status within healthcare hierarchies, the increased visibility of nursing contributions through digital tools may help strengthen the professional profile of nursing and support further development opportunities. However, the need for clear boundaries and frameworks to support shared terminologies is evident.

Improved quality of care is frequently identified as a perceived benefit of DH, particularly through enhanced data analysis and documentation. Greater autonomy and access to personal health records are also notable advantages for patients, reflecting a shift towards more contemporary, holistic, and collaborative care models, in contrast to more traditional hierarchical relationships. However, the literature also highlights the potential for global disparities in DH provision (Badr et al., 2024). Effective engagement with DH requires access to appropriate technologies. Staff may lack access to essential databases, programmes, and applications needed to implement digital systems, and patients may face barriers such as the inability to afford devices or reliable internet access. These issues point to a widening digital divide that has implications for equitable DH provision.

## Implications for nursing practice

The concept analysis of DH significantly impacts nursing practice by enhancing patient care, updating nursing education, and guiding policy development. DH technologies like EHRs, telehealth, and wearables provide nurses with real-time data, improving decision-making and patient monitoring. Such improvements in data accessibility and decision-making can lead to reduced hospital readmissions and better management of chronic conditions (Zhu & Cahan, 2016). Nursing education must incorporate digital literacy to prepare nurses for a digitally driven healthcare environment, focusing on EHRs, telehealth, data management, and ethical issues (Rutledge et al., 2021). Policy development should support DH integration, ensuring patient data privacy and security, facilitating telehealth use, and encouraging interprofessional collaboration (Poitras et al., 2023). This analysis emphasises the transformative potential of DH in nursing, underscoring the need for nurses to adapt to technological advancements and influence healthcare policy, thereby

enhancing care quality and outcomes.

## Conclusion

This concept analysis of DH through the Walker and Avant framework has illuminated the vital role of digital technologies in modern nursing practice. It has identified the defining attributes of DH, such as technology utilisation, interconnectivity, accessibility, personalisation, efficiency, data-driven and patient engagement, and explored the implications of these attributes for nursing. The importance of DH in enhancing care delivery, improving patient outcomes, and facilitating a more personalised approach to healthcare is seen as a dynamic process. As this analysis indicates, a unified effort to incorporate digital skills into nursing education and practice is essential for nurses to remain competent in healthcare delivery during the digital era. Future nursing practice must embrace these technologies to provide efficient, evidence-based care centred around patients' needs and preferences. The findings from this analysis advocate for the development of policies and frameworks that support the secure and effective use of DH, underscore the need for ongoing digital literacy training for nurses, and highlight the critical role of nurses in the digital transformation of healthcare.

As we move forward, DH will continue to shape the landscape of healthcare delivery, making it imperative for the nursing profession to adapt, innovate, and lead in integrating digital technologies into all facets of patient care. Integrating these technologies transforms nursing practice, making it more efficient, data-informed, and patient-centred (Gopal et al., 2018). By utilising DH, nurses can provide higher-quality care, respond promptly to patient needs, and contribute to improving health outcomes (Orton et al., 2018). The potential risks associated with DH cannot be minimised, as disruptions in access, understanding, or implementation may lead to poorer patient outcomes. This raises important questions about accountability for nurses and other healthcare staff who must operate within increasingly digital systems.

Recognising DH as an umbrella term identifies potential for concept analysis of the sub terms used within the literature to further strengthen the shared language. The need for conceptual refinement to enable measurement and practice application requires careful application to avoid inconsistency. Whilst the broad concept identifies risk in theoretical application it also offers opportunity as a construct to link related technologies. This concept analysis thus serves as a foundational step toward realising the full potential of DH in nursing practice, ultimately contributing to the advancement of healthcare in the digital era.

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