Digital Health for Nursing and Midwifery in Australia

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Contents

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- La Trobe University
- James Cook University
- University of South Australia
- Australian Catholic University.

Our living textbook model

A collaborative, evolving resource

This is a living open textbook that evolves in response to collective feedback and practices in learning and teaching. This version of the text will be joined by further chapters in development, which will be progressively published through 2025/26. We welcome any feedback to inform the continuing development of the resource.

Publication timeline

This book is being published iteratively across three intentional phases.

Tranche 1:

Four chapters published 12 May 2025

Tranches 2 and 3 (under development):

New content building on first four chapters, including:

- Section 3. Interpreting and understanding data quality in digital health
- Section 4. Digital health care contexts
- Section 5. Digital health and future technologies

Please express your interest here to receive notification when new chapters are published peer review or co-develop these chapters.

Foreword

Digital health is rapidly transforming the way in which health care is delivered. The work of nurses and midwives, as pivotal professionals engaged in care delivery, is widely impacted by digital technologies along with the collection, interpretation, and application of large volumes of health-related data. As such, it is essential for nurses and midwives to possess the necessary skills and capabilities to function in increasingly digitised health and social care settings. This Open Educational Resource (OER) seeks to address the necessary content to enable this, providing the foundations of evidence-based digital health for undergraduate nursing and midwifery students along with clinicians wanting to increase their digital knowledge and skills.

The book grounds digital health nursing concepts in concrete practices and enables learners to explore these through practical online learning activities, designed around the five domains and embedded capability statements of the Australian Digital Health Agency's (2020) National Nursing and Midwifery Digital Health Capability Framework, namely:

- Digital professionalism
- Leadership and advocacy
- Data and information quality
- Information-enabled care
- Technologies.

The resource has been developed by nursing and midwifery leaders in digital health from across higher education institutions, with expertise in editing, writing, and open educational publishing and provides core content for undergraduate nursing and midwifery curricula across Australian universities and TAFE institutions, reflecting contemporary best practice in digital health. The book will also be beneficial in

informing postgraduate education programs focusing on digital health. It is informed by a perspective that recognises the digital divide and limitations of digital health in certain contexts. In this way, the book distinctively addresses digital health for rural and remote populations, and culturally safe ways of approaching digital health for Indigenous communities.

This OER addresses nursing education needs identified by the National Nursing and Midwifery Digital Health Capability Framework and professional accrediting organisations, such as:

- a need to integrate the Framework by scaffolding it into curricula (Stunden et al., 2024)
- nursing academics' limited knowledge and confidence in teaching digital health theory and its application in nursing (Zhao et al., 2024)
- nursing students being unprepared for settings with rapidly evolving technologies (Raghunathan et al, 2023) and new models of care (e.g., telehealth) (James et al., 2021)
- a recognised gap in digital dexterity for new professionals (Stunden et al., 2024)
- barriers for graduate work readiness, and future health workforce digital capabilities (Ho et al., 2023; Morris et al., 2021; Raghunathan et al., 2023)
- need for learning resources enabled by case studies reflecting best practice expectations, emerging trends, and supporting lifelong learning and continuing professional development (ANMAC, 2019; NMBA,2022)
- an integrated approach to interprofessional practice development, building knowledge, skills and attitudes supported by case studies, enabling positive team behaviours and competent interprofessional practice (ANMAC, 2019).

Additionally, this OER seeks to address gaps in existing learning resources, including:

- inability of traditional textbooks to keep pace with the rapidly changing nature of digital health practices

- expensive paper-based and online digital texts for both students and libraries, with licensing limitations increasing barriers to student access, especially in rural areas
- lack of integrated focus on rural and remote health care contexts, pertinent use of case studies, addressing geographical barriers to education and workforce development priorities (Calleja et al., 2022)
- a lack of integrated principles of culturally safe digital health service delivery in partnership with Indigenous communities that reinforce professional practice expectations in accordance with Codes of Conduct for nurses and midwives (NMBA, 2018)

The nature of this OER enables content to be freely accessible and able to be used by educators and others. We encourage readers to utilise the content and feedback on their experiences using it as well as enhancements we could make in the future.

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1. Introduction to digital health

1.1 Legislation and regulatory frameworks in digital health [Forthcoming]

Please note this book is being published iteratively. This chapter is under development and will be available soon.

Please express your interest here to be notified when this content is published. We welcome EOIs to peer review or co-develop these chapters.

1.2 Communication in the digital health context

Angela Brown; Joanne Harmon; and Ken Ho

Figure 1: An AI-generated vision of digital health. Source: created with DALL·E by OpenAI

The integration of digital communication into health care has revolutionised the way healthcare services are delivered, enhancing the accessibility, efficiency and quality of nursing and midwifery care. This chapter aims to contextualise digital communication within health care. We first provide a scope for communication in

the **digital health** context with reference to national digital health strategies. We then provide an overview of digital communication tools used nationally and internationally. The challenges and opportunities brought by such tools are then discussed, particularly for vulnerable and marginalised groups in Australia. Throughout the chapter, you will be guided to relevant readings and websites, and we provide examples to help your understanding of concepts and apply digital communication in practice contexts. This chapter will be a foundation for later chapters to develop deeper knowledge in digital health.

LEARNING OUTCOMES

By the end of this chapter you will be able to:

1. Describe how digital communication is used in health contexts and the national strategies guiding its development.
2. Describe digital information and communication tools employed in the Australian health system.
3. Identify challenges and opportunities for digital communication in healthcare contexts.

FRAMING QUESTIONS

1. What is meant by ‘digital health’ and ‘digital communication’?
2. What primary tools are involved in digital health nationally and internationally?
3. Who are the stakeholders in digital communication in healthcare

contexts in Australia?

4. What are challenges and opportunities of digital communication in healthcare contexts?
5. How can digital communication enhance accessibility and inclusivity and the health literacy of vulnerable or marginalised populations?
6. How can digital communication support person-centred care in nursing and midwifery?

1. Introduction to digital health communication in national and international contexts

Digital health refers to 'systems, tools and services based on information and communication technology that can be used to treat patients and collect and share a patient's health information' (Australian Institute of Health and Welfare, 2025). Digital health is a contemporary development, nationally and internationally. It shows great potential in helping to overcome traditional challenges in health care, such as inequitable accessibility, management of chronic illnesses, duplicated investigations and more. The **World Health Organization** (WHO, 2021) in its *Global strategy on digital health 2020–2025* (PDF) has suggested that digital and information and communication technologies are essential for universal health coverage and better protection from health emergencies. Therefore, digital health is an enabling factor for people to enjoy better health and wellbeing. However, the use of digital and information and communication technologies to improve healthcare delivery and patient outcomes (generally known as **digital transformation**) can be challenging for institutions, healthcare professionals, healthcare providers and end users (e.g. patients and caregivers).

In the context of digital health, communication has two-way functionality involving

data sharing between a sender and a receiver. It can be **synchronous** or **asynchronous** for the purpose of delivering or receiving health and medical care. While sharing and exchange of health data is essential for communication in the context of digital health, those health data are also personally identifiable and contain sensitive information. As such, a high safety and security standard is crucial, and this requires strategic commitment and investment. In Australia, the Australian Digital Health Agency is the lead organisation for guiding the operation and development of the national digital health infrastructure that underpins the delivery of digital health.

VIDEO: NATIONAL DIGITAL HEALTH STRATEGY 2023–2028

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://oercollective.caul.edu.au/digital-health-australia/?p=266#oembed-1

Source: National Digital Health Strategy 2023–2028 on YouTube.

1.1 National digital health strategy: outcomes, enablers and roadmap priorities

The video above, introduced the *National Digital Health Strategy 2023–2028*. In this section, you are going to develop a deeper understanding of the National Digital Health Strategy, in terms of its outcomes, enablers and roadmap priorities.

ACTIVITY

Refer to Table 1: Health system outcomes and digital health

Re: National Digital Health Strategy outcomes.

- Explore the four health system outcomes.
- Identify how and why these outcomes are relevant to communication in digital health care for nurses and midwives?

Table 1: Health system outcomes and digital health

Health system outcome	Relevance to communication in digital health
Digitally enabled	Digital health tools help healthcare providers to work together, connect services, share information and make decisions.
Person-centred	More reliable and comprehensive health information lets clients interact with healthcare providers to develop personalised support for unique health needs.
Inclusive	Through information and communication tools (e.g. telehealth), individuals (e.g. people in rural areas) in unconventional health service settings have more access to health care.
Data-driven	Data sharing between individuals and healthcare providers facilitates more informed clinical decision-making based on an individual's needs.

ACTIVITY

To deliver the outcomes of the National Digital Health Strategy effectively

and successfully, four change enablers have been identified. Explore these four change enablers.

Finally, Table 2 summarises the 12 priorities in the strategy delivery roadmap of the National Digital Health Strategy.

Table 2: Health system outcomes and priorities

Digitally enabled	Person-centred	Inclusive	Data-driven
Connect care Enable a digitally ready workforce Enhance and maintain modern and integrated digital solutions	Support strong consumer digital health literacy Increase availability of health information Enhance consent management and flexible health information exchange	Improve and expand virtual care Integrate personal devices Support equitable health access	Use health information for research and public health purposes Plan for emerging data sources and technology Monitor and evaluate outcomes and progress

The National Digital Health Strategy has driven the development of digital communication initiatives in Australia. These initiatives are now increasingly used by people across the country.

ACTIVITY

Visit the Australian Digital Health Agency website digitalhealth.gov.au

- Which digital health initiatives have you used, as an Australian citizen or resident, or as an international student?
- How do these initiatives appropriately use digital technologies in health?

2. Digital communication tools in Australia

Digital communication tools are at the heart of Australia's journey toward enhancing healthcare service and delivery. Ensuring communication systems are connected and can share information easily is key. In Australia this is supported by the:

- National Digital Health Strategy
- Digital Health Blueprint and Action Plan 2023–2033
- National Healthcare Interoperability Plan.

The National Digital Health Strategy has digitally enabled connection of care as a core priority. This means digital communication tools are required for virtual connection of care episodes. These tools can streamline workflows, promote timely decision-making and support person-centred care across the nursing and midwifery professions.

Australians increasingly expect, as a norm, the use of digital capabilities to support their health and wellbeing. Therefore, it is important that nurses and midwives are informed and understand the evolving expectations and needs related to digital health communication tools. Increasingly, communication can be improved by consumers and healthcare providers using digital devices such as smartphones, applications (apps) and websites, combined with the availability of near real-time data to support and enhance services.

In Australia there has been a shift from paper-based records to digital (electronic) medical records. More efficient communication and collaboration can occur between different health care providers when notes are located on a patient's electronic medical record. For example, patient medications, investigation results and discharge summaries.

ACTIVITY

Before we look at the types of digital health tools in detail, jot down a list of where you think digital health communication tools could be used and what their implications are.

- Think about people seeking health care in regional places. What could digital communication mean for these communities?
- Think about your previous or future clinical placements. How could digital health communication improve the transfer of information for service delivery? What do you think the barriers might be?

Table 3 shows some digital communication initiatives and examples.

Table 3: Digital communication initiatives and examples

Digital communication initiative	Examples of use
National secure messaging capability for the exchange of clinical documents	When a nurse caring for a patient in a rural hospital requires input from a metropolitan nurse, the patient's clinical records can be accessed
Connection of residential aged care facilities to My Health Record	When a resident receives an intervention such as a vaccine, their health record is kept up to date
Electronic referrals, transfers of care and discharge summaries	For every episode of care, documentation provides for subsequent continuity of care that is culturally safe which is inclusive, providing convenience, often beyond traditional business hours
Electronic prescribing	No more use of paper prescriptions means valuable information is not lost. Prescriptions are legible
Newborn enrolment information	Registration of a child's birth in their state or territory, with Medicare enrolment and birth verification to enable ease of access to other government payments and services
Advance care planning	Accurate and accessible documents to support, ongoing care and treatment preferences, and end-of-life decisions

The next sections introduce a range of digital health communication tools and explores their application in real-world Australian healthcare contexts.

2.1 Mobile health

Mobile health (or mHealth) leverages mobile devices and applications (apps) to deliver health services and messages, facilitate patient engagement and improve health outcomes.

For example, parents can digitally manage their child's health information through the My Child's eHealth Record. This ensures continuity of care, as clinicians can access past care information, vaccination records, allergy information, medication records and pathology tests at the point of care.

ACTIVITY

Explore an mHealth app like Healthdirect or Pregnancy+.

- Evaluate its features. Consider how it supports midwifery or nursing care.
- Identify issues with the app.
- Identify potential improvements that could be made to protect people.

2.2 Digital medicines: electronic prescribing and medication charts

Electronic prescribing (ePrescribing) and medication charts can reduce errors and improve patient safety by providing accurate and up-to-date information. ePrescribing is the use of electronic rather than paper prescriptions. An ‘eScript’ can be sent to a person by SMS or email. The benefit of an eScript is that it comes with a QR code (also known as a digital token). The pharmacist then scans this so that they can access the prescription and give the person their medication. eScripts might also benefit those who are travelling or short on time, as the eScript can be forwarded to the pharmacist for pick up. Additionally, eScripts are less likely to be forged. The challenge with handwritten prescriptions is that they can contain errors, be inaccurate and have poor legibility, therefore, be more susceptible to fraud (Sendlhofer et al, 2019)

ACTIVITY

Read this paper by Sendlhofer et al (2019) on a new approach of assessing patient safety aspects in routine practice using the example of "doctors handwritten prescriptions".

It is important to note that handwritten medication prescriptions may still be common in some hospitals, more so when situations arise when the internet is unavailable or on weekends.

Reflect on how incorrect, incomplete or illegible prescriptions risks patient safety and impacts workload for nurses and midwives as well as doctors due to the misinterpretation of handwriting.

CASE STUDY

Review the Australian Digital Health Agency website.

A patient in rural Victoria received a prescription electronically via the ePrescribing platform, avoiding the need to travel to a general practitioner (GP). Discuss how this aligns with the Australian Digital Health Agency's goals.

2.3 Healthcare identifiers

The Healthcare Identifiers Service assigns unique identifiers to individuals, providers and organisations, facilitating seamless data exchange.

Websites

Read more about individual healthcare identifiers on the Services Australia website and about healthcare identifiers generally on the national Department of Health and Aged Care website.

ACTIVITY

How do healthcare identifiers support continuity of care in a midwifery caseload model or a GP medical clinic, particularly to ensure accurate data exchange, maintain patient privacy and enhance care coordination across multidisciplinary teams?

2.4 Electronic health records

The My Health Record system is a cornerstone of Australia's National Digital Health Strategy, centralising health information for access by authorised healthcare providers.

ACTIVITY

See AuDigital Health on YouTube.

Access a video tutorial on the My Health Record system.

- Discuss with your student peers how electronic health records impact interdisciplinary collaboration in nursing or midwifery care.
- Consider the ethical implications of accessing sensitive patient information through electronic health records.

2.5 Telehealth

Telehealth refers to the provision of healthcare services, information and education using digital communication technology. This includes virtual consultations, remote monitoring and health education, allowing care to be delivered across geographical

barriers. As a tool to enhance nursing care, telehealth supports telenursing, enabling patients to receive remote monitoring, telephone triage, health coaching and help with postoperative recovery or chronic health condition management. Likewise, telemidwifery integrates telehealth technologies into midwifery care. It enables midwives to remotely monitor pregnancies, offer antenatal education and provide postnatal support, such as breastfeeding guidance and postpartum recovery care. This approach is particularly beneficial for individuals in remote or underserved areas, ensuring that they receive consistent and quality maternity care.

Telehealth can provide vital healthcare services to remote and marginalised populations in Australia. What other populations could benefit from telehealth? Review the list below and see if you can think of any others.

- **Rural and remote communities:** provide access to specialists and healthcare services that may be unavailable locally.
- **Elderly populations:** reduces the need for travel and supports chronic disease management and routine care.
- **People with disabilities:** offers convenience and accessibility for individuals facing mobility or transportation challenges and those with high healthcare needs.
- **Disadvantaged communities:** bridge gaps in healthcare access for those in low-income or resource-poor settings.
- **Chronic conditions:** facilitates ongoing monitoring and management of conditions like diabetes, hypertension, arthritis and asthma.
- **Mental health patients:** provides accessible therapy and counselling, particularly in areas with limited mental health services.
- **Parents and newborns:** supports postnatal care and consultations for babies in remote locations.
- **Aboriginal and Torres Strait Islander communities:** enhances culturally appropriate healthcare access in remote areas.
- **Immunocompromised people:** reduces exposure risks by enabling remote consultations.

- **Adolescents and young adults:** offers accessible sexual and reproductive health services, including education and support.

Overall, telehealth ensures more equitable healthcare delivery by overcoming geographical, financial and physical barriers.

ACTIVITY

Midwifery students

A midwife in the Northern Territory conducts a telehealth consultation with a pregnant woman experiencing gestational diabetes.

Discuss the benefits and challenges of telehealth in rural maternity care.

Task

Simulate a teleconsultation session between the midwife and a pregnant woman. Have a third person take notes. Focus on communication and building rapport. Make sure each participant attempts each of the three roles.

Nursing students

A community nurse in a remote South Australian town conducts a telehealth consultation with a patient managing chronic heart failure who has difficulty attending in-person appointments.

Discuss the benefits and challenges of telehealth in rural nursing care, focusing on chronic disease management, patient education and access to care.

Task

Simulate a teleconsultation session between the community nurse and the remote patient. Have a third person take notes. Emphasise clear communication, patient education and assessing the patient's

understanding and engagement. Make sure each participant attempts each of the three roles.

2.6 Wearable devices

Wearable technologies like smartwatches and fitness trackers offer real-time health monitoring and empower patients to take charge of their health.

Reading

Read this paper by Canali et al. (2022): Challenges and recommendations for wearable devices in digital health: Data quality, interoperability, health equity, fairness

The four main functions of wearable devices are monitoring, screening, detection and prediction (Canali et al., 2022). Data from wearable devices can be used for continuous and remote monitoring, the aim being the connection with, for example, remote telehealth for individuals who may be at risk of deterioration and require hospitalisation. The role of a nurse or midwife would be accessing and interpreting crucial physiological data such as heart rate, oxygen saturation and so on. Digital technology enables efficient access to and communication of patient data and supports nurses and midwives' workflow, routine tasks, and information management (Schlicht et al 2025).

During COVID-19 remote monitoring of mild cases allowed patients to report their vital signs from home to a nurse or other care provider via access to an app or telehealth, reducing the risk of transmission to healthcare providers and other patients by avoiding an in-person assessment (Seshadri et al., 2020).

Wearable devices can also be used for prediction, more so in relation to outbreaks, as uploading of data from those who are infected means primary healthcare nurses can be informed of hotspots and increase education on preventive measures.

What did you think of the paper? Can you think of any other benefits or challenges in the use of wearable devices for collecting health care data?

ACTIVITY

Continuous glucose monitoring (CGM) devices are invaluable for managing gestational diabetes or unstable diabetes for example Explore how wearable devices can support shared decision-making in antenatal care or diabetes care.

Critical thinking exercise

What ethical considerations arise with the use of wearables in vulnerable populations?

2.7 Electronic referrals

Electronic referral systems streamline communication between healthcare providers, reducing delays and improving care coordination. Once an **electronic referral (eReferral)** is made, it can be integrated into the electronic medical record system. This integration, for example, facilitates the automatic sharing of a patient's referral documentation and information in preparation for an outpatient visit.

Website

Read about how NSW Health is using eReferrals at this NSW eHealth website: Engage outpatients

eReferrals save time, enable secure submission of patient information and improve communication between referrers, patients and outpatient clinics. Standardised forms help to ensure that accurate medical information, including test results, medical history and current medications, is captured correctly at the time of referral. The benefits electronic referrals have meant a move away from paper-based referrals, which are usually sent in the mail. Importantly, eReferrals can provide real-time notifications for patients and carers in languages other than English.

ACTIVITY

Midwifery activity

A GP refers a patient with a hypertensive disorder of pregnancy to a specialist via an eReferral system.

How do eReferrals improve communication across healthcare disciplines?

Nursing activity

A GP refers a patient with hypertension and renal failure to a specialist via an eReferral system.

How do eReferrals improve communication across healthcare disciplines?

2.8 Access to trusted data

Access to trusted, evidence-based data is essential for safe and effective nursing and midwifery practice. Sources like the Australian Institute of Health and Welfare (AIHW) and the Joanna Briggs Institute (JBI) offer reliable, evidence-based resources that support clinical decision-making and policy development.

ACTIVITY

Review the AIHW website for data related to chronic disease management in Australia: Australia's health 2024: data insights: The ongoing challenge of chronic conditions in Australia

Identify one statistic and explain how it could influence nursing or midwifery practice or the development of a health promotion strategy.

For example: Find a statistic on the prevalence of diabetes in Australia. Discuss how this data could inform nursing interventions, such as targeted patient education, community programs for diabetes prevention or adjustments to hospital-based care pathways for diabetic patients.

Midwifery students

Search AIHW's website for data on maternal health.

Identify one statistic and discuss how it could influence policy or practice in midwifery.

KEY TAKEAWAYS

- Digital tools such as electronic health records, telehealth and AI enhance communication and care delivery in nursing and midwifery.
- Interactive technologies like wearables empower patients and improve outcomes.
- Ethical considerations, including privacy and equity of access, are integral to using digital tools responsibly.

3. Challenges and opportunities for digital communication in health care

Digital communication in health care has transformed the way information is shared, stored and accessed, enabling more streamlined and person-centred care. However,

the rapid evolution of technology presents challenges and opportunities that must be addressed to maximise its potential while ensuring equitable and ethical practices.

3.1 Challenges

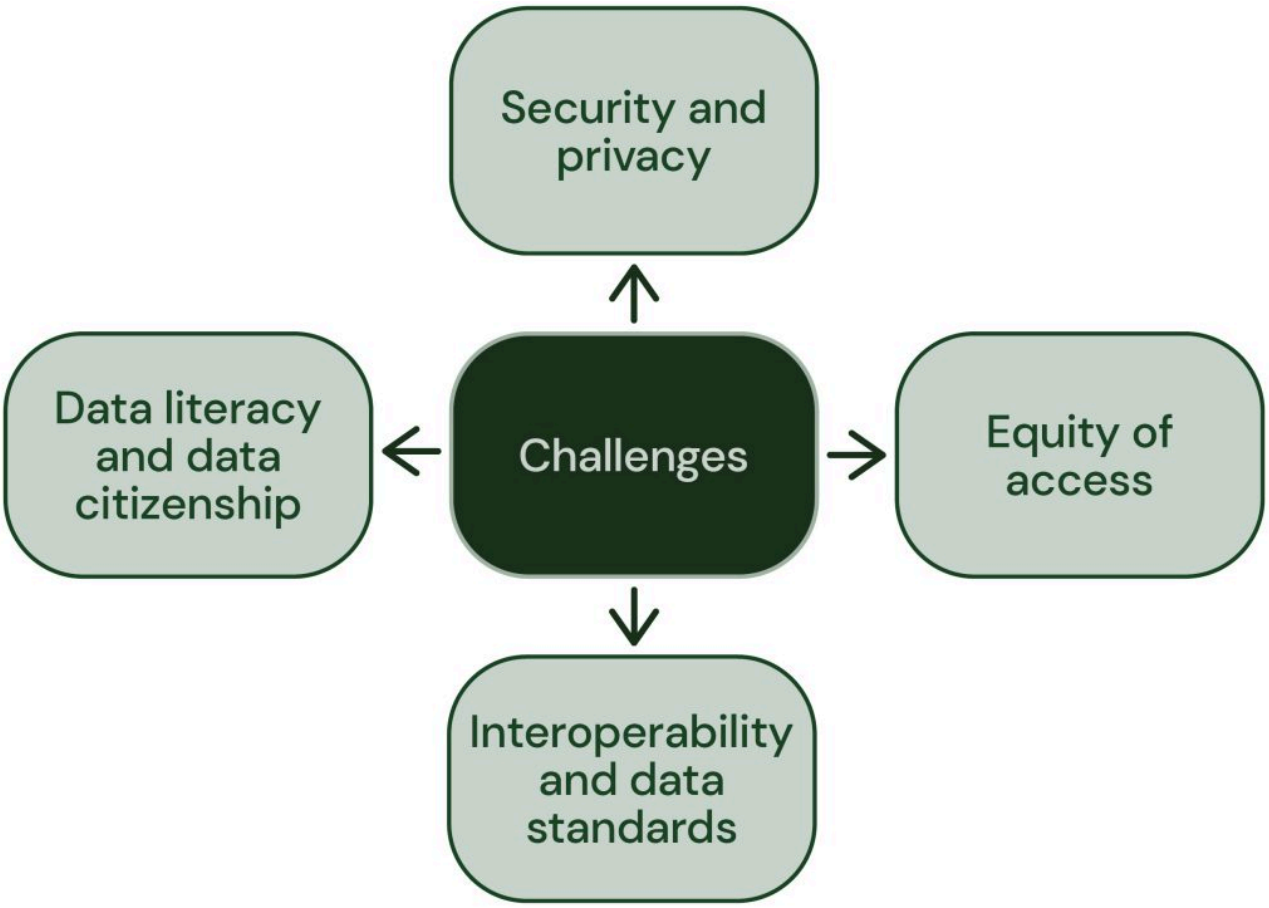

Figure 2: Challenges for digital communication in health care by A. Brown, J. Harmon and K. Ho is used under a CC BY-NC-SA licence

Equity of access

Digital communication relies heavily on technology, which is not equally accessible to all populations. Disparities in access to devices, reliable internet connections and digital skills can make existing health inequities worse, particularly for those in rural or remote areas, for individuals with low socioeconomic status and for older populations. Addressing these barriers is critical to ensuring that healthcare communication is inclusive and equitable for all.

Interoperability and data standards

Healthcare systems often use diverse technologies that lack interoperability, leading to challenges in sharing and accessing patient information across platforms. Without universal data standards, important details may be fragmented or lost, hindering continuity of care and potentially compromising patient safety.

Data literacy and data citizenship

Healthcare providers and people accessing health care need adequate data literacy to understand and effectively use digital health tools. Data citizenship – an individual's ability to engage responsibly with digital data – becomes increasingly important in fostering trust and collaboration in the digital healthcare landscape. Lack of knowledge in this area can limit the effective adoption of technology.

Security and privacy

As health care becomes more digital, the risk of data breaches and cyberattacks grows. Patient data is highly sensitive, and any breach can have devastating consequences for individuals and institutions. Striking a balance between accessibility and robust security measures is essential for maintaining patient trust and compliance with legal and ethical standards.

ACTIVITY

You are a healthcare professional using a new telehealth platform. A patient expresses concern about how their data will be stored and who can access it.

- What steps would you take to reassure the patient about their data privacy?
- Identify one potential ethical dilemma that could arise with the telehealth platform.

- Suggest a best practice that healthcare organisations should follow to maintain data security and build patient trust.

ACTIVITY

Barriers and solutions

Review the following barriers and solutions table and match the correct barrier with the correct solution.

Barrier	Solution
Lack of devices in low-income communities	Establish public wi-fi hotspots
Older adults struggling with digital tools	Partner with charities to donate refurbished devices
Limited internet access in rural areas	Offer free **digital literacy** workshops

Choose one barrier and write a paragraph explaining how implementing the solution might improve healthcare outcomes.

3.2 Opportunities

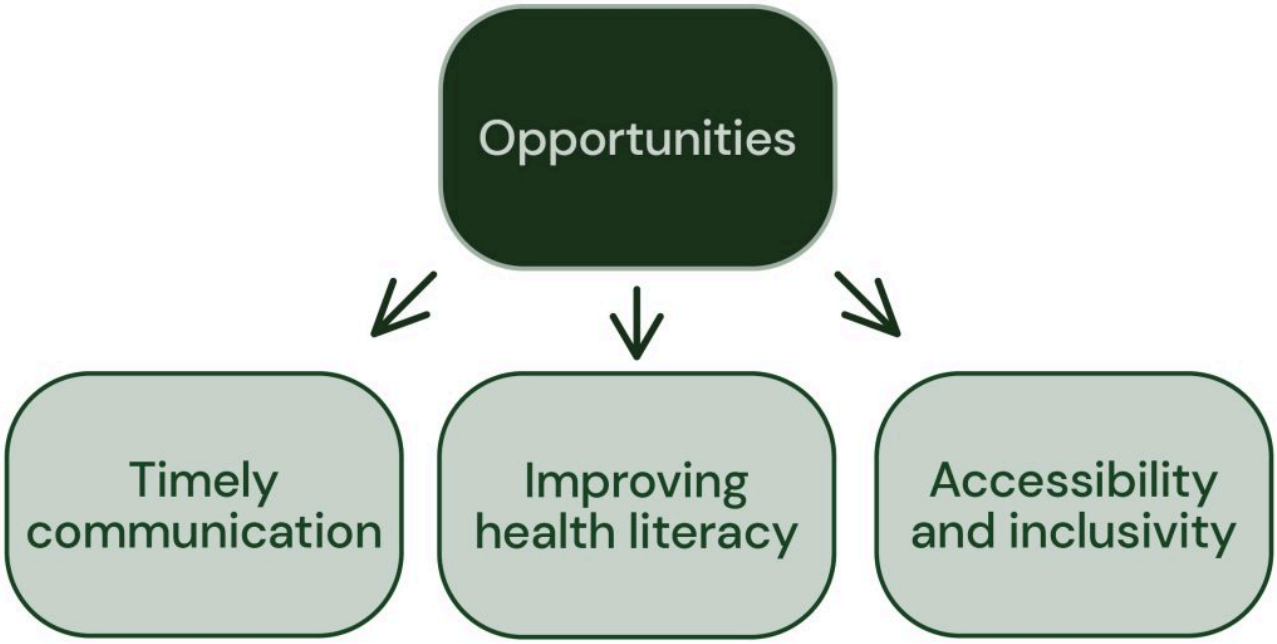

Figure 3: Opportunities for digital communication in health care by A. Brown, J. Harmon and K. Ho is used under a CC BY-NC-SA licence

Timely communication

Digital platforms enable real-time communication between healthcare providers and the people they care for, facilitating faster decision-making and improving outcomes. Tools such as telehealth, patient portals and instant messaging allow for immediate access to care and support, even across large distances.

Improving health literacy

Digital communication opens up opportunities to improve health literacy by providing people with easy access to accurate, evidence-based information. Interactive tools, videos and infographics can enhance understanding, enabling individuals to make informed decisions about their health.

Accessibility and inclusivity

Well-designed digital tools can enhance accessibility for diverse populations, including those with disabilities or language barriers. Features such as screen readers,

translation services and simplified interfaces make health care more inclusive, empowering people to engage more actively in their care.

ACTIVITY

Design challenge: accessibility and inclusion for digital tools

Imagine you are designing a patient portal that caters to diverse populations, including people with disabilities and those with limited English proficiency.

- Create a list of five accessibility features.
- Draw a simple interface mock-up or write a description of how these features would work.
- Write a short explanation of how each feature addresses the needs of specific populations, fostering inclusivity and active engagement in health care.

ACTIVITY

Infographic design: timely communication in action

Design an educational infographic or poster showcasing how tools like telehealth, patient portals and instant messaging:

- improve communication between providers and patients
- enable faster decision-making
- support patients in remote or rural areas.

Include real-world examples or hypothetical scenarios to illustrate your points.

Share your infographic with peers and gather feedback.

3.3 Making positive change in digital communication

Digital communication is reshaping the healthcare landscape, offering immense potential to improve accessibility, consumer engagement and outcomes. However, these opportunities can only be realised by addressing challenges such as inequities in access, technological fragmentation and the need for robust security and privacy measures. Recognising and tackling these issues ensures that digital communication serves as a tool for positive change, fostering a more equitable and efficient healthcare system.

Ethical and legal principles

Health professionals must maintain **confidentiality**, professionalism and legal compliance when using digital tools. Ethical communication requires safeguarding patient privacy, avoiding misinformation and adhering to privacy laws and professional codes of conduct.

Social media policies for health professionals

Social media offers opportunities for education and networking but must be used responsibly. The Australian Nursing and Midwifery Federation advises avoiding patient-identifiable information and maintaining professional boundaries (ANMF, 2022). The Australian Health Practitioner Regulation Agency emphasises confidentiality, accurate information and adherence to advertising rules to avoid disciplinary action (Ahpra, 2022). These will be explored further in the next chapter (1.3).

KEY TAKEAWAYS

Health professionals should always:

- protect patient privacy
- reflect professionalism in all communications
- follow institutional and regulatory guidelines.

By following these principles, health professionals can engage responsibly in digital spaces.

4. Conclusion

This chapter has described digital health, digital communication and various digital tools used nationally and internationally. It introduced communication strategies used in the context of digital health and outlined how the WHO global strategy on digital health has served as a foundation for communication.

Importantly, this chapter introduced some of the key stakeholders in digital communications within an Australian healthcare context. It outlined digital information and communication tools used in the Australian healthcare system and introduced some of the evolving digital communication initiatives, with examples of use ranging from mobile health and applications to record keeping, wearable devices and electronic health records. This provides important foundational knowledge and gives those new to health an insight into the complexity of digital communication tools in use in an Australian healthcare context.

The chapter also introduced how nurses and midwives can use digital health communication tools to support person-centred care in the Australian healthcare system, along with challenges, opportunities and ethical considerations. This included

examples of how digital communication can enhance accessibility and inclusivity and increase health literacy for vulnerable and marginalised populations. Ranging from the use of digital communication tools for those in rural or remote locations to those in marginalised populations, the chapter explored challenges for security and privacy, equity of access, data literacy and citizenship, and interoperability and standards. In addition, opportunities for timely communication, increased accessibility and inclusivity and improved health outcomes were also introduced. Many of these will be explored in more depth in later chapters.

KEY TAKEAWAYS

- Health system outcomes for digital communication are based on digital enablement. The are also person centred, inclusive and data driven.
- The core priority of Australia's National Digital Health Strategy is a focus on connection of care that is digitally enabled to provide person-centred care.
- Digital communication strategies and tools enhances accessibility and inclusivity.
- Digital health strategies can increase the health literacy of vulnerable or marginalised populations.

5. Further reading

Plans, strategies, and websites

Australian Digital Health Agency: National Digital Health Strategy

Australian Digital Health Agency: National Healthcare Interoperability Plan

Australian Government Department of Health and Aged Care: The Digital Health Blueprint and Action Plan 2023–2033

Australian Health Practitioner Regulation Agency. (2022). *Social media guidance*. https://www.ahpra.gov.au/Resources/Social-media-guidance.aspx

Australian Nursing and Midwifery Federation. (2022). *Guidance note: Social media and online networking*. https://anmf.org.au/media/ntfjgv00/anmf-guidance-note-social-media-and-online-networking.pdf

eHealth NSW: Engage outpatients – Outpatient referral management

Healthcare IT News: Inpatient care experience gets a boost from telenursing and AI A story about the provision of care with minimal disturbance to the patient.

Journal articles

Cresswell, N. R., Walker, S. T., Harrison, C., & Kent, F. (2024). Teaching digital interprofessional collaboration. *The Clinical Teacher*, *21*(6), e13651. https://doi.org/10.1111/tct.13651

Hants, L., Bail, K., & Paterson, C. (2023). Clinical decision-making and the nursing process in digital health systems: An integrated systematic review. *Journal of Clinical Nursing*, *32*(19–20), 7010–7035. https://doi.org/10.1111/jocn.16823

This paper identifies how nursing processes of assessment, planning, intervention and outcome evaluations have been incorporated into digital health systems.

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Seshadri, D. R., Davies, E. V., Harlow, E. R., Hsu, J. J., Knighton, S. C., Walker, T. A., Voos, J. E., & Drummond, C. K. (2020). Wearable sensors for COVID-19: A call to action to harness our digital infrastructure for remote patient monitoring and virtual assessments. *Frontiers in Digital Health, 2,* 8. https://doi.org/10.3389/fdgth.2020.00008

Shen, Y., Guo, D., Long, F., Mateos, L. A., Ding, H., Xiu, Z., Hellman, R. B., King, A., Chen, S., Zhang, C., & Tan, H. (2020). Robots under COVID-19 pandemic: A comprehensive survey. *IEEE Access: Practical Innovations, Open Solutions, 9*, 1590–1615. https://doi.org/10.1109/ACCESS.2020.3045792

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1.3 Digital safety and eProfessionalism

Angela Brown and Joanne Harmon

Figure 1: An AI-generated vision of digital security. Source: created with DALL·E by OpenAI

In today's digitally connected world, students and healthcare professionals face new opportunities and challenges when navigating online spaces. As emerging healthcare professionals, students must develop awareness and skills related to **digital safety** and **eProfessionalism** to effectively manage their online presence. Digital safety is the

practice of protecting personal information and maintaining privacy. eProfessionalism refers to upholding a professional identity and adhering to ethical standards in online interactions.

With social media, online networking and digital communication now integral to personal and professional life, understanding the principles of digital safety and eProfessionalism is essential. This chapter explores how students can build a strong and secure digital identity that reflects their values and supports their professional goals. By mastering these principles early, students can lay a foundation for a successful career while protecting their privacy and reputation in the digital realm.

LEARNING OUTCOMES

By the end of this chapter you will be able to:

1. Define digital safety and eProfessionalism and explain their importance in a professional and educational context.
2. Identify key risks and challenges associated with digital interactions and social media use in a professional environment.
3. Apply practical strategies for maintaining privacy, data protection and professional boundaries in digital spaces.
4. Recognise the ethical considerations and implications of online behaviour, especially concerning professional reputation and credibility.
5. Demonstrate appropriate decision-making skills in online communication and interaction to uphold a professional digital identity.

FRAMING QUESTIONS

1. How can online behaviour and digital interactions influence professional identity and reputation?
2. What strategies can help maintain privacy and protect personal information in a professional online setting?
3. In what ways do ethical considerations shape responsible online conduct, particularly within professional contexts?
4. How can students create a digital presence that aligns with their career goals while also safeguarding their privacy?

IMPORTANCE OF THIS TOPIC

In the digital age, a strong online presence is both an asset and a risk. Understanding digital safety is crucial for protecting personal data, while eProfessionalism is essential to shaping a credible and positive professional identity. This chapter introduces students to the principles of digital safety, from managing privacy to understanding cyber risks, and explores how to build a professional digital footprint that aligns with career goals. By mastering these skills, students can navigate online spaces with confidence, protecting their reputation and fostering meaningful, responsible digital interactions. It also highlights the importance of inclusivity and accessibility in digital engagement and acknowledges the unique challenges faced by rural and First Nations students in navigating online spaces.

1. Introduction to digital safety and

professionalism

Social media has very broad definitions, as it is constantly evolving. Basically, it refers mainly to internet-based tools that allow individuals and communities to gather, communicate and share ideas, personal messages and so on (Ventola, 2014). The following is a general list of common types of social media. Be mindful that these types provide a variety of features that serve different purposes (Ventola, 2014).

- Social networking
- Professional networking
- Media sharing
- Content production
- Knowledge information
- Virtual reality and gaming.

ACTIVITY

For each of the social media types, provide an example and consider how your chosen sites have changed over time.

eProfessionalism is also a broad term used to describe behaviours in the online environment for professionals, including nurses, midwives and other healthcare professionals (Ryan et al., 2019). From the general public's perspective, a range of factors influence what the public thinks is 'OK' and 'not OK' in relation to online environments. Public perspectives differ locally, nationally and globally based on cultural and social beliefs. People will make personal decisions about what they interpret in relation to the intent of social media content – for example, whether it is malicious or harmful.

Misuse of social media can have serious implications for nursing and midwifery students. This is an area of growing concern in higher education for healthcare professionals (Westrick, 2016). As a result, there has been an increased focus on education about the use of social media, how it can become a distraction and its impact on professionalism. While most students use social media for personal reasons, many popular sites also promote social and educational uses. It is this cross-over of focus that can lead to inadvertent breaches of privacy and impacts on eProfessionalism (Duke et al., 2017). Safety in relation to the use of public platforms requires increased awareness.

When you think of digital safety, what comes to mind? You might think you can't be 'unsafe' online because you do not feel physically at threat. But digital safety refers to practices and the strategies you take to protect your personal information online. Think about your digital footprint and how that relates to your professional life.

Now consider eProfessionalism, which is the way people present themselves professionally in online spaces.

ACTIVITY

A nursing student posted this to their social media account:

> Just finished a crazy shift at the hospital! Had this one patient who was totally out of it and kept asking the same questions over and over 🤦‍♀️ Honestly, can't wait until I'm done with these placements – patients are so exhausting! Anyway, time to unwind 🍷💉 Anyone else need a drink after placement?! #NursingLife #PatientDrama #AlmostThere

Can you identify the problems in this post? Write them down and link them back to digital safety and eProfessionalism.

Now consider the points below:

- What would a future employer think of the nursing student's post above?
- How can the student vent their frustrations in a more private and professional manner?
- What steps can you take to build a professional online identity that you're proud to share?
- How do you feel about working with someone who makes social media posts in this manner? Would there be implications for your own professional identity if you were to 'like' this type of post.

1.1 Codes of conduct and social media guidelines

Once you have recorded your thoughts on the problems in the post above, refer to the Nursing and Midwifery Board of Australia (NMBA) codes of conduct (for nursing or midwifery – whichever is relevant).

Note the content in **Section 3.5 Confidentiality and privacy** under the domain **Practise safely, effectively and collaboratively** and **Principle 3: Cultural practice and respectful relationships**.

See also – ANMF Social Media policy

Revisit your thoughts from the activity above and consider if further additions are required. Then read the box below to see what we identified.

KEY PROBLEMS IN THE POST

Breach of patient privacy: although the patient isn't named, sharing details of a clinical interaction violates **confidentiality** principles. In health care, maintaining patient privacy is paramount, even in informal settings such as social media.

Lack of professionalism: expressing frustration with patients publicly undermines the student's professional image, as well as that of the profession. Respect for people accessing health care is a core value in health professions.

Negative representation of commitment: comments about being 'done with placements' and viewing patients as a burden reflect poorly on the student's dedication to their role as a future healthcare professional.

Inappropriate associations: referencing alcohol immediately after discussing clinical work portrays poor judgement and raises concerns about professional boundaries.

Now share the post with a friend or family member. What do they think about it? You may be surprised at how they also perceive the post.

Be mindful when sharing on social media that your voice is not present to explain the context or intent, nor can you predict how a post will be perceived.

Remember that you also have no control over a post once it has been published.

Refer again to the nursing or midwifery code of conduct. Note the content under the domain **Act with professional integrity** and Principle 4: Professional behaviour.

Consider how to engage safely and effectively in professional relationships. Revisit your thoughts from above and consider if you have further additions for your reflection.

VIDEO

Watch the following video and review some of the examples on

eProfessionalism. Note your thoughts and start to consider your own social media habits. Are you at risk?

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://oercollective.caul.edu.au/digital-health-australia/?p=268#oembed-1

E-professionalism and practice in the digital age: Ethical, legal and practice considerations 2015. Source: NLCSW on YouTube.

1.2 What is the potential impact of online conduct?

Posts like the one above and those outlined in the video can have lasting personal and professional consequences. They can damage your reputation, now and in the future. Employers and professional peers will often review social media profiles, meaning that even a single unprofessional post can harm future employment opportunities.

- Consider the implications of future employment opportunities or if the people you provide care for, or their family members saw that social media post three years from now.

These types of posts also pose the potential for disciplinary actions from regulatory bodies, which may view them as a breach of the NMBA professional code of conduct, leading to reprimands or restrictions. National boards such as the NMBA can consider social media use in your private life, more so if concerns are raised about fitness to hold registration. Be mindful that even if a post is made with privacy settings, its content can often still be accessed.

Website

Check out the NMBA guidance statement on social media: Social media: How to meet your obligations under the national law

Note the content under the title 'What are the common pitfalls when using social media?'

- See also – ANMF Social Media policy

ACTIVITY

Let's extend from the post. Consider if on the day after the post, the person who made the post was at work. One of the people they were providing care for dies unexpectedly, and there is an inquest into that death. The person who made the post was also identified as making a medication error, and there was a near miss (a potentially serious accident avoided).

How do you think the post would be perceived and interpreted by the healthcare organisation?

Consider the following real-life case where a hospital fired four nurses for making disparaging comments about patients in a TikTok video.

CASE STUDY

A US hospital in Atlanta, Georgia, fired four labour and delivery nurses after they posted a TikTok video mocking patients they found annoying. They filmed the video at work. This highlights the need to educate students

about the implications of posting inappropriate work-related comments or videos on social media.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://oercollective.caul.edu.au/digital-health-australia/?p=268#oembed-2

Nurses at Emory Hospital no longer employed after viral TikTok mocking labor and delivery patients. Source: 11Alive on YouTube. See also the ALIVE website article by Reeves Jackson (2022).

The 51-second video features four nurses describing their 'ick', something that annoys them. The comments include:

- 'My ick is when you come in for your induction talking about "Can I take a shower or eat?"'
- 'My ick is when you ask how much the baby weighs and it's still in your hands.'
- 'Another ick, when you're going room to room between one baby mama and your other baby mama.'

The video went viral. Emory Hospital soon posted a response about their awareness of a TikTok video that included disrespectful and unprofessional comments about maternity patients, but it is important and sobering to note that this video is still accessible.

The public, and people accessing health care, place their trust in healthcare professionals. Mistakes that you make online can negatively impact people's overall confidence in health professionals. When incidents like this occur, the NMBA takes disciplinary action, like cancelling or disqualifying registration.

PRINCIPLES AND KEY STRATEGIES OF DIGITAL SAFETY AND EPROFESSIONALISM

Understand your digital footprint: every online activity contributes to a lasting trail of information. Think before you post – what message does it send about you as a professional?

Maintain strong privacy settings: regularly review your social media privacy settings to control who can access your content.

Separate personal and professional accounts: use separate accounts to maintain boundaries and protect your professional image.

Reflect before posting: ensure all content aligns with professional values and respects confidentiality.

Be a positive ambassador for your profession: share content that uplifts your profession and demonstrates your commitment to its ethical standards.

Engage thoughtfully: interact with others online in a respectful and constructive manner, avoiding heated arguments or controversial statements.

THE 3 C'S OF DIGITAL SAFETY FOR HEALTH CARE

Figure 2: The 3 C's of digital safety for health care by A. Brown and J. Harmon is used under a CC BY-NC-SA licence

Control: control who sees your posts and personal information

Consistency: maintain consistent professionalism across all online platforms

Confidentiality: uphold patient confidentiality as a non-negotiable standard, even in casual discussions

2. Understanding digital safety: risks and protections

In the digital world, navigating online spaces safely is an essential skill, particularly for emerging healthcare professionals who must balance personal and professional responsibilities. Understanding common risks and implementing effective protection strategies is critical for maintaining security and professionalism. Let's explore some common online risks.

2.1 Risks

Data breaches

A data breach occurs when unauthorised individuals gain access to personal or

professional information. This could include sensitive details like passwords, health records or financial data.

There have been recent examples in the media where large organisations have experienced data breaches that have exposed millions of users' private information.

Beyond personal inconvenience, breaches can harm professional credibility, especially if workplace data is compromised and you contributed to the breach occurring.

VIDEO

The next video describes a data breach in a health insurance company.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://oercollective.caul.edu.au/digital-health-australia/?p=268#oembed-3

Medical history among data stolen in Medibank cyber attack. Source: 9 News Australia on YouTube.

Phishing attacks

Phishing involves fraudulent attempts to obtain sensitive information, such as login credentials, by pretending to be a trustworthy entity.

You may receive an email claiming to be from a trusted service, asking you to click on a link and update your password. When you click these links, they can compromise your accounts or allow **malware** to be installed on your device.

Oversharing

Let's think about you, the information that you share online and the impact on you and the organisation. Sharing excessive personal information such as your location, daily routine or confidential work details is referred to as oversharing. You might post a photo with sensitive documents visible in the background, or you might discuss workplace care or patient information on social media. Oversharing can lead to privacy breaches, personal security threats or professional boundary violations.

Weak passwords

Using simple, common or reused passwords across multiple accounts can be a threat in the online space. Passwords like '123456' or 'password' make it easy for hackers to access your accounts. Weak passwords are primary entry points for cybercriminals to exploit personal and professional data.

Malware and ransomware

Malware or ransomware is malicious software designed to disrupt, damage or gain unauthorised access to a computer system. Downloading a seemingly harmless file that installs ransomware can end up locking your system until a ransom payment is made. Malware can compromise sensitive data, disrupt work and incur financial costs.

2.2 Protection strategies

Let's now explore some protection strategies for the above risks.

Strong passwords

To protect yourself online, use long, complex passwords containing a mix of uppercase letters, lowercase letters, numbers and symbols. Avoid using the same password for multiple accounts. Use a secure password manager to generate and store passwords and change passwords regularly. When accessing your university or hospital login, consciously think about these strategies as important to protect yourself, the people you care for and your employers.

Multi-factor authentication

Multi-factor authentication (MFA) adds an extra layer of security by requiring a second form of verification (e.g. a code sent to your phone) to log in. Enable MFA wherever possible.

Think before you click

Be wary of links in emails, texts or pop-ups from unknown sources. Verify the sender before clicking. Use tools like URL checkers to ensure the safety of websites.

Secure your devices

Keep your operating system, software and apps up to date with the latest security patches. Install reputable antivirus software and conduct regular scans for threats.

Privacy settings

Review and customise the privacy settings on all your accounts to limit who can see your personal and professional information. Regularly audit your social media profiles to ensure you're not inadvertently sharing sensitive information. Remember that privacy settings can provide a false sense of security. Information might still be public and subject to disclosure at some point (Westrick, 2016).

Be selective with sharing

Think critically about what you share online. Ask yourself:

- Does this reveal too much about my personal life?
- Could this post violate confidentiality or professional standards?
- Would I be comfortable if this information became public?

THE 5 PS OF DIGITAL SAFETY

Passwords: use strong, unique passwords for every account

Phishing awareness: stay alert for fraudulent messages or links

Privacy: regularly review and adjust account privacy settings

Protection software: install and update antivirus tools

Professionalism: keep your online professional and personal identities distinct

ACTIVITY

Assessing your digital practices

Review the privacy settings on your primary social media accounts.

Identify two passwords you use frequently. Are they secure? If not, update them.

Reflect on a time you received a suspicious email. How did you respond? What would you do differently after reading this section?

3. Building a professional digital identity

Establishing a professional digital identity is an essential step for emerging health professionals. Your online presence should reflect your values, highlight your expertise, and maintain clear boundaries between your personal and professional life.

3.1 How to build a professional online presence

Create a professional profile

Use a platform like LinkedIn to showcase your skills, qualifications and achievements. Include a professional headshot and write a clear, concise biography that communicates your career goals.

Maintain consistency across platforms

Use the same name and professional image across all platforms to create a cohesive and recognisable online identity. Ensure your username and handles are appropriate and reflect your professional aspirations.

Post with purpose

Share industry-relevant articles, personal achievements, and insights that reflect your passion and expertise. Avoid posting controversial or irrelevant content that might misalign with your professional values.

Audit your digital footprint

Search for your name online to identify existing content that may affect your professional reputation. Make sure the following are not found in your digital footprint:

- Discussions of educational or work-related issues, including criticisms or complaints about others.
- Shared content of unflattering images or comments about your educational institution, tutors, lecturers, placement location or fellow students, or those you are providing care for.

Remove or privatise any unprofessional or outdated content. Remember that if you can find negative content that you have posted or agreed with (e.g. ‘liked’ or in some instances even viewed) then so can others, including future employers.

3.2 Differentiating personal and professional use

Your ‘off duty’ social media conduct can be compared against professional standards.

Personal accounts: set strict privacy settings to limit who can view your posts. Avoid sharing sensitive information or controversial opinions publicly. Do not have a false sense of security merely because you are in a closed group or have privacy settings – content can also be shared from there. Your digital presence in a closed group can still imply a lack of professionalism.

Professional accounts: keep posts professional, focusing on career-related topics. Engage with peers and organisations to build your professional network. Consider professional boundaries, and do not include as ‘friends’ those you are caring for, likely to be caring for or have previously cared for.

ACTIVITY

Take a look at these private and professional posts. Identify which ones are appropriate and which are not. Write down the issues you identify.

Personal account

> What a beautiful day to unwind after a busy week! Spent the afternoon hiking and enjoying nature 🌿🌞. Grateful for these moments to recharge. #SelfCare #WeekendVibes

OR

> Ugh, so done with work today! I can’t stand how some patients just don’t listen. Honestly, it makes you wonder why you bother some days. Time for a drink 🥂. #RoughDay #WorkFrustrations

Professional account

> Finally got through a day full of meetings … feels like we talked in circles for hours without accomplishing much 🙄. Anyone else feel like these conferences are just for show? #WorkLife #PointlessMeetings

OR

> Excited to attend the upcoming Midwifery and Maternal Health Conference! Looking forward to learning about innovations in continuity of care and networking with fellow professionals. #MidwiferyLeadership #ContinuousLearning

4. Privacy and data protection in professional spaces

Protecting your privacy and data in online spaces is crucial for safeguarding your professional reputation and personal information.

PRACTICAL GUIDANCE FOR PRIVACY SETTINGS

Customise privacy controls: regularly review the privacy settings on all social media platforms and adjust them to limit access to your posts and profile.

Monitor app permissions: check the permissions of apps you use,

ensuring they do not have unnecessary access to personal or professional data.

Be cautious with sharing: avoid sharing sensitive information like workplace details, locations or confidential data online.

Use strong passwords: use strong, unique passwords for each account, managed with a secure password manager. Regularly update your passwords and avoid sharing them with others.

Secure your accounts: enable MFA for an added layer of security.

5. Ethical and legal considerations in online conduct

Online behaviour carries ethical responsibilities and potential legal implications, particularly in professional contexts.

Refer to your professional standards, and think about the application of these in online conduct:

- Nursing students, access the Registered nurse standards for practice
- Midwifery students, access the Midwifery standards for practice
- If you are studying in another health profession, look up your own standards.

Know and follow the explicit guidelines, policies and rules that are in place for your educational institution and workplace in relation to mobile phone use, photography and electronic communications.

KEY TAKEAWAYS

Ethical responsibilities

Confidentiality: uphold the privacy of colleagues, clients and organisations by not sharing sensitive information online.

Respect: avoid engaging in or endorsing disrespectful, harmful or discriminatory content.

Accuracy: share reliable, evidence-based information and avoid spreading misinformation.

Legal implications

Breach of confidentiality: discussing private or identifiable details about patients, women, clients or workplace incidents can result in legal action and breach professional codes of conduct.

Defamation: making false statements about individuals or organisations online can lead to legal consequences.

Copyright and intellectual property: to prevent infringement claims, avoid sharing or using copyrighted material without permission.

ACTIVITY

1. Familiarise yourself with your standards

Access the **Registered nurse standards for practice** or the **Midwife standards for practice**.

Focus on the following:

- Standard 2: Engages in professional relationships and respectful

partnerships

- Standard 3: Demonstrates the capability and accountability for midwifery practice

2. Scenarios

Read the following scenarios about midwives or nurses and answer the guiding questions based on the standards.

Scenario 1: Social media oversharing

A midwife posts a photo on Instagram of themselves at work, showing details of a woman's case notes and identifying details of another client. A pregnant woman is visible in the background. The caption reads:

> Another busy day at the clinic – making sure every mum-to-be gets the care she deserves! 💕 #MidwifeLife

OR

> A nurse posts a photo on Instagram of themselves at work, with a man's case notes and identifying details visible. A female patient with a black eye is in the background. The caption reads:
>
> Another busy day at the trauma clinic – making sure every mum-to-be gets the care she deserves! 💕 #NurseLife

Questions

- Which professional standards are potentially breached in the post?
- What are the ethical and legal risks of sharing identifying details for the woman/man?
- What are the implications for the person in the background?
- How could the midwife or nurse have celebrated their work without compromising confidentiality?

Scenario 2: Responding to online criticism

A midwifery student comments on a social media post discussing hospital policies:

> Honestly, the management here doesn't care about staff or the women. It's all about the budget. No wonder people don't want to work here.

OR

A nursing student comments on a social media post outlining their upcoming clinical placement location and discussing that hospital's policies:

> Honestly, I don't want to go there for placement. The management here doesn't care about the nursing students learning. It's all about the budget. No wonder students don't want to go here.

Questions

Does this comment align with the standards for respectful partnerships and accountability?

- What alternative actions could the midwifery/nursing student take to express their concerns professionally?
- What are the potential professional and legal implications of the comment?
- Reflect on the implications sharing this type of post will have for the student in relation to their obligations as students.
- Consider how the educational provider will respond on being informed by the healthcare facilities concerned about the student's social media posts.

Scenario 3: Sharing personal opinions

You are scrolling your social media posts when not on placement and

come across a fellow healthcare professional you met on placement. They have posted the following comment in a public health debate forum:

> Vaccines are dangerous, and I wouldn't recommend them to my clients. Do your research!

Questions

- How does this statement reflect professional accountability and evidence-based practice?
- What risks does this pose to public trust in healthcare professionals?
- What professional standard emphasises the importance of evidence-based information?

3. Create a personal action plan

Based on what you have learned so far, draft a personal action plan that outlines:

- Do's and Don'ts for your online conduct as a healthcare professional.
- Steps you will take to ensure compliance with professional standards.
- How you will handle ethical dilemmas online in the future.

ACTIVITY

Review the following infographic, developed after a review of the literature on eProfessionalism in nursing and midwifery. Consider the findings in

relation to the blurring or overlapping of personal and professional boundaries.

- What are your thoughts on the findings on professionalism?
- How do professional standards influence your understanding of ethical online behaviour?
- What challenges might you face in maintaining professionalism online, and how can you overcome them?

NURSING & MIDWIFERY STUDENTS AND DIGITAL PROFESSIONALISM

What we found

There is a need to increase awareness of social media policies and procedures amongst nursing and midwifery students. Multiple and effective strategies are required to ensure a greater presence and applicability in preregistration curricula.

1

SCOPING REVIEW 2024 (1)

The databases MEDLINE, CINAHL, Embase (OVID) and Scopus were searched, identifying 1087 articles up to May 2024. There were 17 articles that met the inclusion criteria. The aim was to identify and map the perceptions associated with the professional use of social media among nursing and midwifery students.

2

CONTENT ANALYSIS

Each of the 17 articles were analysed using qualitative inductive content analysis. Two major themes: *Professional Boundaries* AND *Responsibility and Accountability* and six subthemes were synthesised to present a coherent narrative of the findings.

3

STUDY CHARACTERISTICS

There were no date restrictions applied; the year of publication ranged from 2012 to 2023. Most studies were cross-sectional descriptive designs (n=12). A wide number of countries were represented: Saudi Arabia, Turkey,, Canada, United Kingdom, Carribbean Islands, United States of America Australian, South Africa and China. The most widely used social media platforms were Facebook, Instagram, Twitter (X) and WhatsApp.

4

DISCUSSION

Key points:

- social media use aids professional identity development
- not all students place value and/or understand the importance of adopting professional attitudes and behaviours, and the impacts on their digital footprint when using social media
- students can have difficulty in separating their personal and professional online personas (digital duality)

5

WHAT NOW?

Educators and regulators can raise awareness by:

- guiding students on how to navigate personal and professional boundaries,
- providing university discipline-specific guidance on the professional use of social media
- using a co-design approach when seeking input

1. Gum, L., Brown, A., Royals, R., Matricciani, L., & Kelly, M. A. (2024). Digital professionalism in preregistration nursing and midwifery students: A scoping review to explore perceptions of professionalism when using social media. Nurse Education in Practice, 80, 104128-. https://doi.org/10.1016/j.nepr.2024.104128

Figure 3: Digital professionalism in preregistration nursing and midwifery students (Gum et al., 2024). All images used under a Pixabay licence

ACTIVITY

Social media self-audit

Using the steps below, conduct a self-audit of your social media activity in line with the key policies and procedures for your university, profession and any clinical placement venues. How do you think you fare?

Steps for self-auditing your social media presence

- Make a list of your active accounts
- Find and note any unofficial accounts using your name
- Make a list of deactivated accounts
- Check your profile and cover photos
- Check the 'about' section on each platform
- Revisit the hashtags you have used or intend to use
- Look at the insights and analytics – who is looking at your old posts?
- Review who is following you and has access to your content

6. Practical strategies for eProfessionalism

To maintain a professional and effective online presence, follow these key strategies:

- Use clear, professional and respectful language in all online interactions.
- Avoid emojis, slang or casual language in formal or professional contexts.
- Prioritise sharing content that aligns with your professional values and expertise.
- Cite credible sources and provide appropriate attributions when sharing external content.
- Engage thoughtfully with professional networking communities by commenting on posts, joining discussions and attending virtual events.
- Use platforms like LinkedIn or X to connect with colleagues and industry leaders and maintain a professional tone.

7. Equity, Access and Diversity in Digital Health

Digital health is transforming how healthcare is delivered, improving access, efficiency, and continuity of care across many settings. But while these technologies offer new opportunities, they don't benefit everyone equally. For digital health to be truly effective and ethical, it must be inclusive, accessible, and culturally safe—especially for those in rural and remote areas and for Aboriginal and Torres Strait Islander communities.

As a nursing or midwifery student, you may experience some of these challenges firsthand. If you live or study in a rural area, you might face slow internet, limited access to devices, or fewer chances to build digital confidence. These issues can affect your learning, your ability to participate in telehealth or online placements, and even how you use digital systems in practice. Understanding these barriers is essential—not just for yourself, but to advocate for equity on behalf of the people you will care for.

First Nations students often navigate additional layers of complexity. Mainstream digital platforms may not reflect the cultural values and knowledge-sharing practices of Aboriginal and Torres Strait Islander communities, which are grounded in relationships, oral storytelling, and collective decision-making. Without cultural

awareness, digital health systems can unintentionally exclude or disrespect these ways of knowing, leading to data misuse or loss of trust.

As future professionals, it's important to critically reflect on how digital health can uphold—or undermine—cultural safety. This includes understanding the concept of data sovereignty, recognising the impact of algorithmic bias, and advocating for systems that centre Indigenous perspectives from the start.

By bringing equity, cultural safety, and inclusion to the forefront of digital health education, you'll be equipped to use technology in a way that supports—not sidelines—the diverse people and communities you'll work with. Nursing and midwifery students have a vital role to play in building a digital health future that is not only innovative, but socially just.

ACTIVITY

Activity: "Whose Health Story Is Missing?" – A Digital Inclusion Detective Challenge

Purpose: To help students identify who may be excluded or misrepresented in digital health systems and reflect on how they can advocate for more inclusive digital practice.

Materials

Scenario cards (can be printed or used digitally)

Access to an internet-enabled device for group research

Digital or paper worksheets for reflections

Instructions

Divide into small groups (3–4 students).

Each group receives a scenario card describing a digital health interaction. Examples:

- A telehealth platform that doesn’t support local Aboriginal languages.
- A pregnant woman in a remote community with patchy internet access.
- A student midwife unsure whether to post a photo from placement on Instagram.
- An older refugee woman unsure how to use the maternity hospital’s online booking portal.

Groups must play Digital Inclusion Detectives. Their task is to:

- Identify who is missing or marginalised in the scenario.
- Consider what barriers exist (cultural, geographic, technological, ethical).
- Suggest creative, culturally safe or inclusive solutions.

Each group then shares a quick “Digital Justice Pitch” back to the class—a 2-minute explanation of what they found, who was at risk of being excluded, and how they would fix the system or situation.

Debrief Questions

What did you notice about who is usually centred in digital health design?

How might nursing and midwifery students act as advocates for digital equity?

How can your own future digital footprint reflect inclusivity and cultural safety?

8. Scenarios

Consider the following scenarios and answer the prompting questions.

SCENARIO 1: OVERSHARING ON SOCIAL MEDIA

A nursing student posts about a challenging patient experience on their personal Instagram account. While the post doesn't include the patient's name, it provides enough context for identification.

- How could this situation breach confidentiality?
- What strategies could the student use to reflect on their experience in a more appropriate setting?

SCENARIO 2: PROFESSIONAL IMAGE ON LINKEDIN

A midwifery student includes casual photos from their personal life on their LinkedIn profile, including a photo of them drinking alcohol at their sister's wedding.

- How does this impact their professional image?
- What steps can they take to align their profile with professional expectations?

9. Final reflections

In this chapter, we have explored the foundational concepts of digital safety, eProfessionalism and online conduct, equipping you with the tools to navigate the digital world responsibly.

- How does your current online presence align with your professional goals?
- What steps can you take to enhance your eProfessionalism?
- How might you manage a situation where a colleague posts unprofessional content online?

Creating a digital presence that aligns with your career goals while safeguarding your privacy is an essential skill in the modern professional landscape. By understanding the principles of digital safety and eProfessionalism, you can create an online identity that not only reflects your values but also upholds the ethical and legal standards of your profession. Through thoughtful content sharing, robust privacy practices and a commitment to respectful online interactions, you can build a digital footprint that supports your aspirations and protects your reputation. As emerging professionals, mastering these strategies early lays the groundwork for a successful career in an increasingly interconnected and digital world.

Reflect on your current online presence and ask yourself: Does it represent the professional you aim to become?

By taking intentional steps today, you can confidently navigate the online environment and foster meaningful connections that align with your career goals.

10. Conclusion

This chapter described digital safety and eProfessionalism and outlined how they are important in professional and educational contexts. It started with the common risks and challenges associated with digital interactions and social media in professional environments. It also provided a summary of the types of practical strategies that can be used for maintaining privacy, how protection of data can occur and the importance of maintaining professional boundaries in digital spaces.

The chapter introduced the evolving ethical considerations and implications of online behaviour and outlined the implications of using social media and its impacts on

professional reputations and individual credibility. By working through examples of appropriate decision-making in online communication and interaction, the chapter provided practical means on how to develop and maintain professional digital identity. This all constitutes important foundational knowledge and introduces those new to health to the complexity of digital safety.

In addition, the chapter looked at how to build and establish professional identity guidance, and ethical and legal considerations in online conduct. Practical steps and strategies were introduced, along with tips on how to develop and maintain digital eProfessionalism and the **3 Cs of digital safety for health care**.

The chapter included examples, case studies and scenarios to illustrate the inherent challenges in digital safety and professional decision-making. Ranging from social media for personal or professional use to understanding digital safety, links were provided to professional codes of conduct and guidelines on how to meet national legal obligations. Students have also been encouraged to consider educational institution polices and guidelines on social media and information technology.

KEY TAKEAWAYS

- Digital safety and eProfessionalism have profound influences on a person's professional identity and reputation.
- Protect your digital identity through privacy settings, strong passwords and thoughtful sharing.
- Use strategies to ensure boundaries are in place between personal and professional use of social media.
- While social media can provide advantages for professional networking, students are advised to be mindful that they create a digital presence that aligns with their career goals.
- Misuse of social media can have serious implications for nursing and midwifery students in the present and in future employment

prospects.

- The ANMF and NMBA have codes of conduct and guidelines which address the use of social media and how to meet national legal obligations.
- Educational providers have student codes of conduct and policies for social media and information technology.

11. Further reading

Websites

Australian Nursing and Midwifery Federation: Social media and online networking guidance note

Nursing and Midwifery Board: Social media: How to meet your obligations under the national law

Journal articles

Canali, S., Schiaffonati, V., & Aliverti, A. (2022). Challenges and recommendations for wearable devices in digital health: Data quality, interoperability, health equity, fairness. *PLOS Digit Health, 1*(10), e0000104. https://doi.org/10.1371/journal.pdig.0000104

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Mather, C. A., & Cummings, E. (2019). Developing and sustaining digital professionalism: a model for assessing readiness of healthcare environments

and capability of nurses. *BMJ Health & Care Informatics, 26*(1), e100062. https://doi.org/10.1136/bmjhci-2019-100062

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and virtual assessments. *Frontiers in Digital Health, 2*, 8. https://doi.org/10.3389/fdgth.2020.00008

Ventola, C. L. (2014). Social media and health care professionals: Benefits, risks, and best practices. *P T. 39*(7), 491–520.

Westrick, S. J. (2016). Nursing students' use of electronic and social media: Law, ethics, and e-professionalism. *Nursing Education Perspectives, 37*(1). https://journals.lww.com/neponline/fulltext/2016/01000/nursing_students__use_of_electronic_and_social.5.aspx

2. Digital health workforce and systems transformation

2.0 Digital health workforce and systems transformation

Tracy Parrish; Sharon Bourke; and Jenny Davis

Figure 1: An AI-generated vision of the digital health workforce. Source: Created with DALL·E by OpenAI

The **digitalisation** of health care has transformed the workforce by improving efficiency, collaboration and productivity. Healthcare professionals are now required to be proficient in using various digital tools such as electronic medical records, artificial intelligence and telemedicine platforms to deliver quality patient care. This digital change has reshaped roles and responsibilities allowing nurses and midwives to spend more time on direct patient care. Thus, streamlining the way we deliver health care to enhance patient and population outcomes, including for First Nations people, in rural settings, underpinned by principles of diversity and inclusion.

Nurses and midwives play a crucial role in the successful transformation of **digital health** systems, leveraging competencies in technology integration, data analytics,

telemedicine and digital health tools to improve patient care and ensure adoption of innovative healthcare solutions across diverse settings.

This chapter identifies the enablers and challenges of digital health and describes how nurses and midwives can implement strategies to support changes in digital health in the current and future climates of a digitalised workforce. The chapter begins by describing a digital health workforce, including nurses and midwives as clinical informaticians. It then examines capability frameworks and digital health systems applications in health care, current applications, facilitators and barriers to implementing digital health and strategies to support a digitalised healthcare workforce. The chapter concludes by identifying future directions and ongoing professional development for digitally capable nurses and midwives.

LEARNING OUTCOMES

By the end of the chapter you will be able to:

1. Describe what is meant by a digitally capable health workforce.
2. Identify the different roles of nurses and midwives as part of the digital health workforce.
3. Identify current digital health workforce frameworks.
4. Describe what is meant by systems transformation.
5. Identify examples of digital health system applications in healthcare settings.
6. Describe implementation strategies for digital health.
7. Examine challenges with digital health systems implementation.
8. Identify strategies to support a digitally capable workforce.
9. Describe ongoing professional development for a digitally capable nurse or midwife.

FRAMING QUESTIONS

1. What are the key digital workforce requirements to support health system applications?
2. Where are nurses and midwives situated as clinical informaticians within the digital healthcare workforce?
3. What are key enablers and challenges to systems transformation? (e.g. individual, workforce, system, process)
4. How can barriers to systems transformation be addressed? (e.g. strategies at individual, policy and education levels)
5. What are the key strategies to support a digitally capable workforce?
6. How can digital health support person-centred care?

1. What is the digital health workforce?

Different definitions of the digital health workforce exist in the literature. It has been suggested that:

> the (specialist) digital health workforce … possess the requisite skills and expertise to manage and govern the safe use of digital health tools and technologies. (Ryan et al., 2021, p. 201)

The broad healthcare workforce itself includes clinicians, system analysts, engineers, programmers, web-application developers, enterprise architects, integration specialists, data scientists, health informaticians, health information managers, health economists and cyber analysts (Lloyd et al., 2023). Increasingly, they all must be able to use digital technologies regardless of their role and specialised skills.

The necessary technical, cognitive and behavioural skills for a digitally enabled workforce identified by Lloyd et al. (2023) include:

- confidence in the use of technologies and systems to capture data and present, interpret and share information
- the ability to apply data science techniques to enable evidence-based decision-making and informed planning
- knowledge of information governance and security
- the ability to work with vendors and specify requirements for systems that can support workflow management and support the interdisciplinary team and consumers of health care.

In addition, the digital health workforce should have business skills required to create the case for technologies and identify technology benefits (Australian Digital Health Agency, 2020; Australian Institute of Digital Health, 2022).

However, it can be overwhelming keeping up with the rapid expansion of digital tools and applications, variously known as virtual technologies, medical applications, eHealth and mobile health tools, digitised health records, patient portals, clinical decision support systems, and personalised and predictive modelling technologies (Lawrence & Levine, 2024, p. 1).

1.1 Roles, careers and endless opportunities

Exciting new roles continue to emerge in digital health, including in clinical or **health informatics**. The terms health informatics and **clinical informatics** are often used interchangeably. Clinical informaticians are clinicians with specialised knowledge, skills and credentials in the application of informatics concepts, methods, tools and information technology to support the safe and effective delivery of health care (Davies et al., 2021; Valenta et al., 2017).

ACTIVITY

The Digital Health Hub by the Australasian Institute of Digital Health (AIDH) is a place where you can explore your digital health literacy, increase your knowledge and understand the next steps in your digital health career journey. Follow each of the links to see what the hub can do for you:

- Complete a self-assessment: evaluate your existing level of competence in digital health
- Increase my knowledge: discover initiatives spanning industry, education and government
- Map my career pathway: explore career pathways to help you on your digital transformation journey
- Track my progress: review your assessment results and update your profile.

The **digital health workforce**, then, can broadly be considered as those working in healthcare settings who, as part of their roles, actively engage in the use of information and communication technologies (ICT) to support the delivery of health care. Healthcare ICT includes digital health and eHealth systems and applications. These are discussed in Section 2.

Development of **digital health competencies** and capabilities within the workforce is critical for digital transformation and sustainable systems of health care. The qualities and capabilities of a digitally enabled workforce include systems thinking, technical proficiency, data analytics and more.

Digital competence is essential not just for health professions. The digital health future involves health service delivery and care models that emphasise consumer and patient experience, enabled by digital health (Australian Institute of Digital Health, 2023).

Digital transformation in health care refers to the integration of digital technologies into all aspects of health care delivery, management and operations. This includes the adoption of electronic medical records (EMR), telemedicine (which can also be referred to as telehealth, telenursing or telemidwifery), health data analytics, artificial

intelligence (AI), wearable health devices and other digital tools to enhance patient care, improve operational efficiency and support informed decision-making (Stoumpos et al., 2023).

Digital transformation and implementation will impact the current and future health workforce, clinical workflows and education, yet the workforce is considered largely unprepared in areas including digital skills, telehealth, virtual care and strategies to keep up with existing and emerging technologies (Morris et al., 2023).

ACTIVITY

Explore the AIDH website. This body represents a diverse and growing community of professionals at the intersection of health care and technology.

1.2 Current digital health workforce frameworks

This section examines some of the frameworks that inform our understandings of digital health workforce capability and competency elements, including core knowledge, skills, attitudes and education.

The **World Health Organization** (WHO) defines digital health as the use of digital, mobile and wireless technologies to support the achievement of health objectives. Digital health includes the general use of ICT for health, and advanced technologies for managing vast amounts of data and information such as AI and for use in fields such as genomics (WHO, 2021).

Genomics refers to the study of an individuals' complete set of genetic information such as in human DNA and other organisms. In recognition of the enormous potential benefits of genomics (and related precision medicine) in health care, including disease

prevention, treatment, research the Australian government is establishing Genomics Australia on 1 July 2025.

This highlights some key, yet diverse, capability areas that may be required for professional and non-professional digital health roles.

The many existing and evolving frameworks and competencies that guide a digitally capable health professional to be safely engaged in digital health care each feature different levels of competence (see Section 4) knowledge, skills and attitudes (Rettinger et al., 2024).

There are also many frameworks for specific professions or settings, and a standardised approach to items and definitions for digital health competence is challenging. A scoping review by Nazeha et al. (2020) identified over 30 digital health competency frameworks, concluding that digital health training should focus on competencies relevant to each work group, role, seniority and setting, and they should also be regularly updated.

Table 1 provides an overview of the various professions engaged in digital health and their associated organisations. It is not exhaustive of all professions, organisations and frameworks.

Digital health is not the domain of one profession; rather, it is multidisciplinary and interprofessional. It involves a wide range of professionals, including healthcare providers, IT specialists, data scientists, engineers, policymakers and digital health strategists, all collaborating to design, implement and manage health technologies that enhance patient care, optimise workflows and improve healthcare outcomes across the world. Globally, the number of professions engaged in digital health is vast highlighting the need for standards and competencies to ensure the safe implementation of health informatics.

Equity and inclusion are also central to digital health practice. As digital health systems evolve, it is essential that nurses and midwives are culturally responsive. This includes recognising and addressing the specific health needs and data sovereignty of Aboriginal and Torres Strait Islander peoples (Ryder et al., 2022), whose knowledge

systems, languages, and perspectives must be valued and integrated within digital health initiatives.

Education for health professionals is critical, and every nurse and midwife must be a digital nurse or digital midwife. Beyond preregistration education, certification programs such as that provided by Certified Health Informatician Australasia (CHIA) serve as formal recognition of specialised health informatics knowledge and skills (Vallely et al., 2024). Ongoing professional development is discussed in more detail in Section 4.

Table 1: A sample of global digital health competency roles, organisations, frameworks and competencies

Sources: Butler-Henderson et al., 2024; Lloyd et al., 2023, and as cited

Health data scientist	
Canadian Institute of Health Information (CIHI)	Health Data and Information Governance and Capability Framework: Toolkit Classified at levels: core, foundational, supplemental, enabling Areas: strategy and governance, policies and processes, assets and standards, people and knowledge
Health informatics	
American Medical Informatics Association (AMIA)	AMIA 2017 core competencies for applied health informatics education at the master's degree level Key aspects of competencies (knowledge, skills, and attitudes)
Australasian Institute of Digital Health (AIDH)	Australian Health Informatics Competency Framework (2nd ed., February 2022) [PDF] The CHIA exam covers six areas: • information and communication technology • health and biomedical science • information science • management science • core principles and methods • human and social context (AIDH, 2022)

Digital Health Canada	Health Informatics Professional Competencies (2022) [PDF] Domains: information sciences, health sciences, management sciences
Gulf Cooperation Council Health Informatics Workforce Working Group	Toward the development of the GCC Health Informatics Career Paths and Matrix (Almalki et al., 2021)
Faculty of Informatics United Kingdom	Competency framework for clinical informatics Domains: 1. Health and wellbeing in practice 2. Information technology and systems 3. Working with data and analytical methods 4. Enabling human and organisational change 5. Decision making 6. Leading informatics teams and projects (Davies et al., 2021, p. 8)
Health information and communications technologists	
American Health Information Management Association (AHIMA)	AHIMA is the national professional association for health information professionals in the US
Canadian Health Information Management Association (CHIMA)	CHIMA is the national professional association for the health information profession in Canada
Health information managers	

Health Information Management Association of Australia (HIMAA)	Digital competency domains: • general professional skills • language of health care • healthcare terminologies and classifications • research methods • health services organisation and delivery • health information law and ethics • e-Health • health information services organisation and management
Australian Library & Information Association (ALIA) and Health Libraries Australia (HLA)	ALIA health library guidelines and competencies
Medical Library Association (MLA)	Health sciences librarians are master's degree information professionals, librarians or informaticists with specialised knowledge in finding, accessing and sharing quality health information resources with clinicians, nurses, pharmacists and other members of the health care team
Health service managers and leaders	

Australasian College of Health Service Management (ACHSM)	Digital competencies: • manages business and clinical requirements using digital tools • advocates for the use of digital health solutions to support innovation, quality improvement, research and health service management • aligns corporate, clinical and information governance • ensures digital health solutions safely, minimising unintended consequences • uses advanced analytics methods and visualisation techniques for information representation • promotes digital health literacy (ACHSM, 2022)
Health Service Executive and Digital Health and Social Care Northern Ireland (HSEDHSC)	All-Ireland digital capability framework for health and social care Digital competency domains: • digital professionalism • leadership and advocacy • data and information quality • information-enabled care • technology (HSEDHSC, 2022)
Health professions	

Nursing and Midwifery Australian Digital Health Agency	National Nursing and Midwifery Digital Health Capability Framework [PDF] Digital competency domains: • digital professionalism • leadership and advocacy • data and information quality • information enabled care • technology (Australian Digital Health Agency, 2020)
Allied health Victorian Department of Health	Digital Health Capability Framework for Allied Health professionals Digital competency domains: • digital workplace (technology, tools, legislation and policies governance) • digital professionalism (digital profile, professional and ethical responsibilities, communication, collaboration, patient-centred care, professional development) • data and informatics (concepts and characteristics, digital integrity and lifecycle, analytical concepts, knowledge creation) • digital transformation (digital innovation, build and test, implementation, evaluation)

Primary health care	Digital competency domains: • optimal use of EMRs • basic computer and internet use • knowledge about digital administrative and organisational competencies • artificial intelligence • smartphone applications for monitoring care(Jimenez et al., 2020)
Australian Medical Council (AMC)	Digital Health in Medicine Capability Framework [PDF]

2. Applications of digital health systems and how they are implemented

2.1 Understanding digital health systems in a healthcare setting

Digital health systems applications refer to the use of technology to improve and streamline various aspects of healthcare delivery. These applications aim to enhance patient care, increase efficiency and reduce costs through the integration of digital tools Below are some common examples of digital health systems applications used in health care (increasingly by nurses and midwives) which enhance access to health care across geographical, social and cultural barriers (Almond & Mather, 2023) and in rural and remote areas, reducing travel times and the need for in-person visits.

Telehealth

Telehealth refers to the use of electronic communications technology to provide care and patient education and facilitate self-care at a distance, including through patient portals, e-consults, video visits and remote patient monitoring. Modification of the term can be used to distinguish the health professional utilising telehealth in patient care, e.g., telemidwifery, telemedicine, telenursing.

WEBSITE

Read more about Telehealth competencies on the AAMC website.

Virtual care

According to Kleib et al. (2024), virtual care:

> facilitates the delivery of health care services via remote communication between patients and health care providers, either synchronously or asynchronously, through information communication technology. (Kleib et al., 2024, p. 1)

Virtual care examples include the Victorian Virtual Emergency Department at Northern Health in Epping, Melbourne, and the virtual care clinics provided by healthdirect (an Australia-wide free health advice service).

ACTIVITY

Search for virtual care clinics in your geographical area.

- Identify the types of virtual care services they provide.
- What technology is required to access this care?

Electronic medical records

Electronic medical records (EMRs) are digital versions of paper-based charts used in hospital and community settings which contain patients' medical history, diagnoses, medications, allergies, diagnostics, radiology imaging and treatment plans (Almond & Mather, 2023). EMRs are also used to store and facilitate the sharing of patient

information across a multidisciplinary healthcare team. EMR implementation has improved patient outcomes, enhanced clinical decision-making and reduced medical errors (Adeniyi et al., 2024).

Mobile health applications

Mobile health applications (apps) include health-related tools that are installed on smartphones or tablets. They often focus on wellness, chronic disease management or health tracking. Examples include vital signs tracking, reminders for medication administration and the delivery of health education and wellness information (Maab et al., 2022).

WEBSITE

See six examples of great healthcare apps at DBS Interactive.

Wearable devices

A wearable health device is any kind of electronic device that is worn on a person's body. Devices like smartwatches or fitness trackers collect real-time data on the wearer's health status and might handle continuous monitoring of vital signs such as blood pressure or heart rate and tracking sleep patterns or physical activity (Teixeira et al., 2021).

Health information exchange

A health information exchange (HIA) allows nurses, midwives and other health professionals to share vital health information electronically through a secure and private application, improving the speed and cost of care (Almond & Mather, 2023).

Artificial intelligence and machine learning

Artificial intelligence (AI) and machine learning (ML) are increasingly used in healthcare applications to analyse large datasets and identify patterns, risks and

predictive outcomes for health conditions (Alowais et al., 2023). Examples include medical imaging analysis, predictive analytics for early disease detection, personalised treatment plans and recommendations based on data analytics.

2.2 Implementation strategies for digital health

Digital health transformation requires planning and preparation, and change will affect the workforce, workflow and resources (Lloyd et al., 2023). However, translation of in-person clinical care to digital care is often ill-prepared to optimise the benefits (DeLaRosby et al., 2024). Planning, implementation and understanding roles and competencies for applications is critical to success and can have positive and negative impacts on clinician wellbeing (Livesay et al., 2023; Wosny et al., 2023).

Implementing digital health solutions effectively requires comprehensive strategies to ensure successful integration into healthcare settings. These strategies should address technology adoption, infrastructure, training, and ongoing evaluation. One example of a framework used to implement healthcare interventions such as digital health is the COMPASS model (Mather & Almond, 2022). Table 2 sets out what the letters of COMPASS stand for.

Table 2: Context optimisation model for person-centred analysis and systematic solutions

Source: adapted from Mather and Almond (2022)

C	**Context**	Understanding the environment or setting in which digital health will be implemented. This includes knowing the culture of the environment, resources and external factors such as politics and finances prior to implementation.
O	**Organisational readiness**	An assessment of whether your workplace or organisation is ready to adopt the change. This may include ensuring your workplace has champions who are experienced and knowledgeable prior to implementation.
M	**Measurement**	Identifying ways to measure implementation outcome success. This may include patient outcomes, process measures and patient and staff satisfaction.
P	**Process**	Understanding the step-by-step actions, methods and strategies for implementing the new digital health application.
A	**Adaptation**	Ensuring flexibility in the intervention is available to allow for adjustments or modifications based on real-time feedback.
S	**Sustainability**	Ensuring that the intervention is maintained after the initial phase begins and putting ongoing strategies in place for long-term support.
S	**Stakeholders**	Engaging staff, patients, managers and external partners in the implementation phase is important to ensure buy-in and acceptance of change.

The **COMPASS framework and implementation model** offers a structured and adaptable approach to implementing health interventions, particularly in digital health contexts. By addressing key components such as context, readiness, measurement, process, adaptation, sustainability and stakeholder engagement, it ensures that digital health initiatives are effectively integrated into healthcare systems and are more likely to achieve long-term success and improved outcomes.

ACTIVITY

Check Mather and Almond's (2022) article on COMPASS to review implementation strategies for digital health in greater detail:

Using COMPASS (context optimisation model for person-centred analysis and systematic solutions) theory to augment implementation of digital health solutions

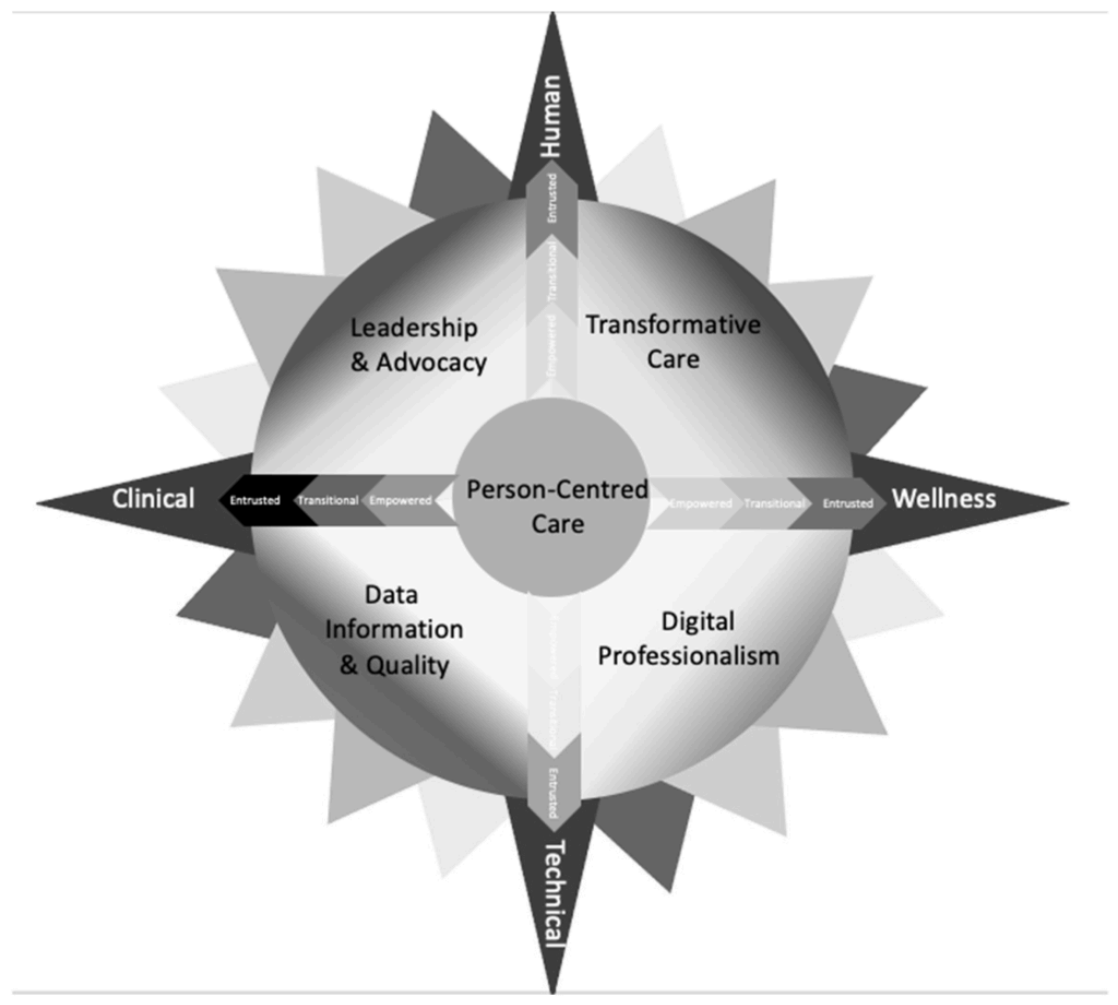

Figure 2: Visual representation of COMPASS theoretical framework and implementation model (Mather & Almond, 2022) is used under a CC BY licence

3. Challenges and strategies for a digital health workforce

3.1 Challenges for digital health systems implementation

The impact of digitalisation on the nursing and midwifery workforce has been profound. As health and care continue to rapidly transform through technological advancements and the growth of data science, these changes will continue to have lasting and widespread implications. **Digital literacy** continues to be a challenge, with many health professionals unprepared to fully harness the potential benefits of digital health. A large proportion of the current workforce has not been trained in digital health care and has had limited opportunities for upskilling, with most attempts being reactive 'on the job' training (Woods et al., 2023). Implementing digital health also requires a focus on diversity and inclusion, especially for First Nations people in rural settings, to ensure equitable access for all (Carpenter et al., 2020). Barriers such as digital literacy, cultural appropriateness and access to services are just some of the challenges faced by First Nations people.

According to Wynn et al. (2023), nurses' resistance to the adoption of digital technology is not a new issue. Resistance to using computers, extensive criticism and concerns about reliability of technology, the degradation of skills or less time spent with face-to-face patient care were some of the challenges experienced by nurses during the implementation of digital health systems (Wynn et al., 2023).

CASE STUDY

Isaac is the nurse unit manager (NUM) of a busy surgical ward in a tertiary referral hospital. The hospital recently informed all NUMs that EMR systems implementation would occur in all wards at the start of the following month, and the NUMs were responsible to ensure this was

successful. Isaac and other NUMs therefore have one month to prepare and train all staff in the EMRs, including many senior staff with no previous exposure to EMRs. Four staff members have already refused to attend training outside their work hours despite being aware of the implementation, stating they did not have time for training nor that it was necessary. They think it is a waste of time.

Inampudi et al. (2024) found that resistance to change negatively affected healthcare workers' intentions to adopt digital care solutions. Other challenges for facilities include:

- costs to implement digital health infrastructure
- added costs to network coverage
- employing experts in digital health
- data privacy and **confidentiality**
- IT infrastructure
- training to ensure digital literacy for nurses and midwives.

ACTIVITY

1. Identify three challenges Isaac has as a NUM to successfully implement technology like EMR into a busy surgical ward.
2. Identify the challenges health services may have when implementing technology like EMR into wards and units.

3.2 Strategies to support a digitally capable workforce

The digital workplace has become a powerful solution to many of the challenges faced by traditional work environments, such as poor collaboration, low engagement and inefficient processes. This shift has been accelerated by significant changes in the way we work, alongside the rise of a digitally capable workforce. Advances in technology have made it easier for healthcare staff to access patient data from virtually anywhere, removing the constraints of relying on physical records that are limited to a single location. However, to fully harness the potential of remote and hybrid access to patient data, nurses and midwives need strategies to efficiently leverage a digitally capable workforce. These strategies should empower healthcare professionals to work more flexibly, optimising the technology available to them. This approach can ultimately improve productivity, communication, engagement and, most importantly, patient outcomes. Digital workplace strategies provide a way for organisations to stay ahead of evolving work trends while enhancing operational processes and the overall employee experience.

According to Woods et al. (2023), strategy development has become a priority in Australia through lessons learned from challenges that have been faced locally and internationally. The Australian National Nursing and Midwifery Digital Health Framework is an important example of current Australian workforce strategies to implement digital health into patient care. The framework encompasses key domains and a structured approach that outlines the skills and knowledge needed to foster and support a digitally capable health workforce.

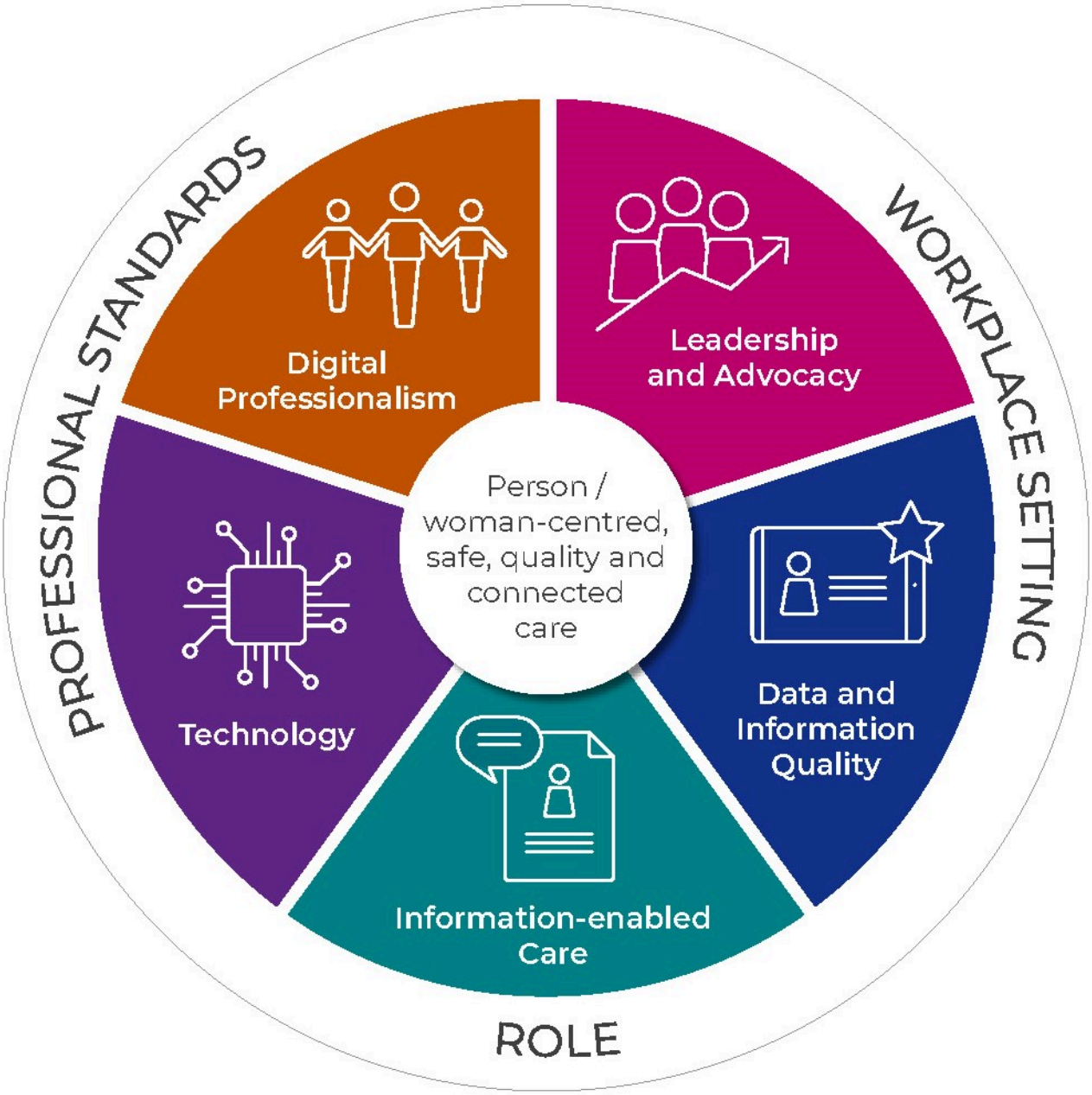

Figure 3: National Nursing and Midwifery Digital Health Capability Framework (Woods et al., 2023) is used under a CC BY licence

Revisit Table 1 to review the Australian strategies to build a digitally capable workforce.

4. Maintaining support and development for a

digital health workforce

4.1 Digital competencies for nurses and midwives

Digital competencies are recognised elements of health professional education. Information literacy and digital competence are essential to ensure nurses and midwives are open to technology and have the necessary skills to effectively manage the increase of digital information critical to their roles. The healthcare workforce must understand how digital technology works and what it can and cannot do to inform safe and effective nursing and midwifery practice.

The Australian Digital Health Agency is tasked with implementing the strategy to support a workforce confidently using digital health technologies to deliver health and care. As the nursing and midwifery professions collectively represent Australia's largest health workforce component, it is imperative that these professions define the core digital competencies that nurses and midwives will need to take direct responsibility for the collection, data entry and use of clinical information.

Digital capability domains

The Australian Digital Health Agency has identified the required digital capabilities based on the roles of nurses and midwives to support their education and training. As shown in Figure 3, the major domains are:

- Digital professionalism
- Leadership and advocacy
- Data and information quality
- Information-enabled Care
- Technology.

These domains in turn have capacity levels that anticipate growth of knowledge, skills and abilities that are formative, intermediate and proficient (see Figure 4). The framework extends the description of competence beyond the technical skills implied to encompass the capability to address wider aspects of professionalism and

continuous development, rather than assessing competence of a skill at a particular moment in time. Frameworks such as the one developed by the Australian Digital Health Agency provide a way for individuals and organisations to promote and encourage positive attitudes in relation to the increasing introduction and adoption of technology and innovation. Nurses and midwives can use such frameworks to assess their own capability across digital health domains. Other healthcare professionals and organisations can also use the framework to understand the digital health capabilities of nurses and midwives.

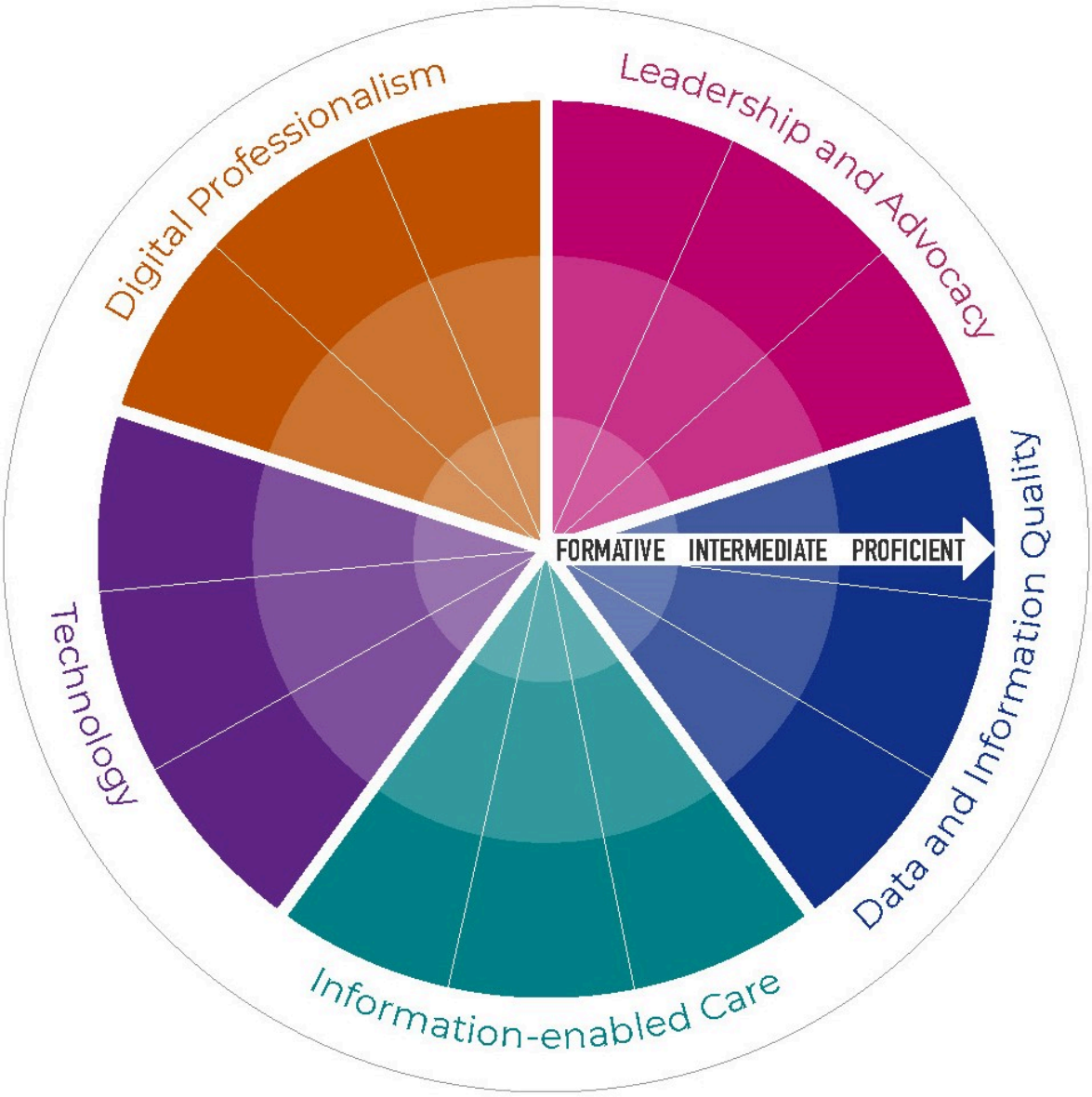

Figure 4: Formative, intermediate and proficient capability levels in the National Nursing and Midwifery Digital Health Framework, is used under a CC BY licence

4.2 Ongoing professional development

To address the gap in digital health literacy, various methods of education and training should be used to gain, maintain and improve the digital health literacy of nurses and midwives. However, not all staff need to be digital experts and having a small number of digital experts in a certain area would ensure staff have access to 'in-the-moment' training from experts. The minimum standards of digital literacy for health professionals have been outlined in the case studies below as a basis to support beginner digital competency.

Digital capability competencies

The framework intends to promote and encourage positive attitudes in relation to the increasing introduction and adoption of technology and innovation for novices. Competencies at the **formative** stage include using email for communication, video conferencing, EMRs, virtual health care and cyber security (Morris et al., 2023). Training on digital professionalism such as using technology at the bedside, training on the use and value of data in digital systems and providing lifelong training when staff transition into leadership roles are also important considerations in developing nurses' and midwives' **intermediate** digital capability. The **proficient** level reflects nurses and midwives in leadership roles who are championing digital health in practice and in the broader nursing and midwifery professions.

CAPABILITY LEVEL CASE STUDIES

The following case studies demonstrate examples of suggested capability levels based on how nurses and midwives can leverage digital capabilities to enhance their practice, contribute to their teams and drive positive changes in health care. The capability framework supports nurses and midwives to effectively engage with technology to improve patient care, support their colleagues and drive innovation in health care specific to the

needs of the nursing and midwifery professions but also to health care more broadly.

Level 1: Awareness

Familiarisation with digital tools

Figure 5: Image by DC Studio on Freepik

Scenario: Akio, a newly graduated midwife, is introduced to a digital tool for tracking prenatal appointments. During her orientation, she learns the basics of logging in and navigating the system. While she primarily uses paper-based records, she attends a workshop where she observes how experienced colleagues use the digital tool to streamline appointment scheduling.

Outcome: By the end of her orientation, Akio feels more confident about using the tool and recognises its potential to improve communication with patients. She starts integrating it into her workflow during patient visits.

Level 2: Foundational

Implementing digital documentation

Figure 6: Created with DALL·E by OpenAI

Scenario: Carlos a registered nurse, has been working on a surgical ward and is transitioning from paper-based documentation to an electronic health record (EHR) system. He attends training sessions to learn how to document patient assessments digitally.

Outcome: Carlos quickly adapts to the EHR, using it to record vital signs and medication administration. He also starts helping colleagues who struggle with the transition, fostering a collaborative learning environment that improves overall team efficiency.

Level 3: Intermediate

Using data for patient safety

Figure 7: Image by macrovector on Freepik

Scenario: Remy, a nurse in a busy emergency department (ED), analyses data from the EHR to identify patterns in patient wait times. She discovers that patients presenting with chest pain often wait longer than average for triage.

Outcome: Remy presents her findings at a staff meeting, leading to the implementation of a new triage protocol that prioritises chest pain presentations. This change significantly reduces wait times and improves patient outcomes in the ED.

Level 4: Advanced

Leading a telehealth initiative

Figure 8: Created with DALL·E by OpenAI

Scenario: Davos, a nurse educator, is tasked with developing a telehealth program for managing chronic diseases. He collaborates with IT and the multidisciplinary team of healthcare professionals to design an interactive platform for patient education and monitoring.

Outcome: The telehealth program is launched successfully, allowing patients to receive real-time feedback on their health data. Davos trains staff on using the platform effectively, resulting in increased patient engagement and better management of chronic conditions.

Level 5: Expert

Influencing national digital health policy

Figure 9: Created with DALL·E by OpenAI

Scenario: Clinical Professor Finn (RN, RM, CHIA), an expert in digital health, is invited to a national committee to discuss the future of healthcare technology. Finn presents evidence-based recommendations on integrating AI into nursing and midwifery workflows to enhance person-centred assessments and clinical decision-making.

Outcome: The national committee insights lead to the formulation of guidelines that promote AI use across healthcare settings, ultimately improving care quality and efficiency. Finn also mentors other nurse and midwife leaders, ensuring a sustainable approach to digital health innovations.

Generative artificial intelligence

Higher education providers and health services both need to play a role in ensuring the digital capability of the health workforce. In the past, university preregistration education programs providing basic digital health education to students have relied on health services to teach digital technologies on clinical placement (e.g. EMRs and mobile computers/digital workstations) (Raghunathan et al., 2023).

However, with the emergence of generative artificial intelligence (GAI) and other technologies, universities have needed to quickly develop strategies to improve

delivery of technology into curricula to prepare students for the evolving digital health care landscape.

AI, and GAI, are poised to revolutionise health care, promising to improve health outcomes and enhance clinical decisions (Reddy, 2024). GAI is a subset of AI that generates images, text and other media based on human prompts. AI and GAI are discussed in more detail in other chapters.

Strategies to support a digitally capable workplace include integrating minimum standards of digital literacy into undergraduate nursing and midwifery programs, and universities partnering with healthcare organisations to provide digital literacy micro-credentialling to improve the digital literacy of the healthcare workforce appropriate to their role and skill levels.

The following concept box provides some examples of how nursing and midwifery educators can incorporate GAI to prepare preregistration students for digital health in practice.

GAI IN NURSING AND MIDWIFERY PREREGISTRATION EDUCATION PROGRAMS

GAI could be used for:

- the enhancement of simulation-based learning by generating realistic and complex patient care scenarios based on the level of the learner
- personalised education through analysing learning patterns to tailor educational content to the needs of the student (Li et al., 2024)
- creating education modules and materials that can be scaled and distributed across different institutions, health services and other organisations
- helping educators by automating routine tasks like preparing and marking educational materials.

5. Future directions

5.1 Future workforce trends and challenges in nursing and midwifery due to evolving roles and models of care

Despite significant advances, there has been concern that the professions of nursing and midwifery have not kept pace with digital advancement in health care (Morris et al, 2023). To respond to these challenges and embrace the benefits of a rapid transformation, the professions need to be responsive and adaptive and inclusive. Nurses and midwives currently use digital health care by using telehealth to triage, assess, diagnose and monitor patients remotely, and by using smartphone applications to support self-monitoring of patients. Many applications are also used in education for nurses and midwives. The integration of GAI and robotics in health care presents a unique opportunity for nurses and midwives to take on leadership roles in technology implementation. By leveraging advancements, they can enhance patient care, streamline processes and improve outcomes.

As frontline caregivers, nurses and midwives are well positioned to identify areas where technology can make a meaningful impact. Their insights can drive the development of tools that not only support clinical tasks but also enhance patient engagement, health literacy, cultural responsiveness and education. Furthermore, embracing these technologies allows them to focus on the human aspects of care, such as empathy and communication, while technology supports more routine tasks.

Healthcare professions, including nursing and midwifery, rely on multidisciplinary teamwork, and the potential for GAI to streamline tasks and enhance coordination offers an exciting opportunity for greater efficiency in teams. In addition, GAI has the capacity to enhance the collective knowledge of healthcare teams. Imagining GAI as an integral component that provides critical insights for shared decision-making suggests a future where technology effectively complements human expertise. Furthermore, nurses emphasise the importance of effective communication among healthcare professionals. GAI's role in facilitating information sharing aligns with their dedication to improving inclusive, safe and effective patient outcomes,

illustrating a forward-thinking approach that integrates collaboration and technology for the advancement of patient care.

5.2 Maintaining the person at the centre of care in a digital environment

Digital technologies such as GAI provide an opportunity to enhance patient care and streamline healthcare processes. However, it is important to consider the unique role nurses and midwives have in caring for people. Compassionate care, advocacy and human connection are the cornerstone of the roles of nurses and midwives. Even while embracing innovation, it is the nurse's or midwife's unique ability to forge authentic bonds that distinguishes their practice (Rony et al., 2024).

It is crucial for healthcare education and ongoing professional development to adapt, equipping nursing and midwifery professionals with the skills to navigate and lead in this evolving landscape. This proactive approach ensures that they remain integral to the healthcare team and can advocate effectively for their patients in a technology-driven environment.

ACTIVITY

1. How do you perceive the collaboration between GAI technologies and human nurses and midwives? What roles and responsibilities do you envision for GAI in enhancing person-centred or woman-centred care, and how do you see these roles evolving?
2. What ethical considerations do you believe should be considered when integrating GAI into nursing or midwifery care? How can these considerations be addressed to ensure patient safety, privacy and overall wellbeing?

6. Conclusion

Digital health transformation is disrupting and challenging traditional healthcare roles and boundaries. While largely welcomed, it creates challenges in establishing what might be considered core competencies across the many current and emerging digital health roles and digital health care settings.

This chapter has discussed the evolving digital health workforce capabilities and examined the key role of nurses and midwives in leading change and the successful implementation of digital health systems.

Digital health systems and applications aim to improve access, efficiency, quality and sustainability of healthcare delivery. The future success of digital health systems is reliant not just on readily accessible technology but also on ensuring we have a digitally capable workforce.

Building and sustaining workforce capability through education and training is therefore critical. Factors for success include employer support, overcoming clinician resistance, and clear digital health career pathways and professional development.

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2.1 Digital health advocacy role of health professionals [Forthcoming]

Please note this book is being published iteratively. This chapter is under development and will be available soon.

Please express your interest here to be notified when this content is published. We welcome EOIs to peer review or co-develop these chapters.

2.2 Digital health and health care governance [Forthcoming]

Please note this book is being published iteratively. This chapter is under development and will be available soon.

Please express your interest here to be notified when this content is published. We welcome EOIs to peer review or co-develop these chapters.

2.3 Digital health leadership and management

Tracy Parrish; Kalpana Raghunathan; Ken Ho; and Fiona Faulks

Figure 1: An AI-generated concept of digital health. Source: Created with Microsoft Copilot

This chapter aims to provide health professionals with a foundational understanding of leadership and management in **digital health**, preparing them to navigate the evolving digital ecosystem and contribute meaningfully to the future of health care.

Nurses and midwives comprise the largest professional group in healthcare environments, and they are increasingly required to adopt digital competencies and leadership skills to ensure effective care delivery in a rapidly evolving environment. The National Nursing and Midwifery Digital Health Framework (October 2020)

outlines key capability requirements for nurse and midwifery leaders with respect to digital health.

These capabilities acknowledge the leadership role of nurses and midwives in shaping digital health technologies. By contributing to the design, implementation and evaluation of digital health systems, nurses and midwives can bridge the gap between policy and patient-centred care. Nurses and midwives are also expected to explore new data sources, participate in digital technology decisions, and lead the development of digital health strategies and policies. This includes ensuring that the principles of diversity, equity, and inclusion are upheld for all groups and individuals involved, as well as the broader community.

Digital health leadership involves guiding healthcare teams and organisations through the integration and application of technologies such as electronic medical records, telehealth platforms and clinical tools powered by artificial intelligence (AI). Effective leadership requires more than technological understanding – it demands the ability to influence, collaborate on and advocate for sustainable digital transformation that aligns with clinical goals and improves patient outcomes. Management, on the other hand, involves the coordination and oversight of digital initiatives to maintain efficiency, safety and quality in care delivery.

The chapter provides insights into leadership theories relevant to digital health, practical strategies for managing digital initiatives and the challenges posed by legal, ethical and regulatory frameworks. It also addresses the essential elements of stakeholder engagement, risk management and alignment of business objectives with healthcare priorities to ensure seamless digital integration. With case studies illustrating real-world applications, the chapter will equip health professionals with frameworks for digital leadership and guide them on how to lead effectively in the dynamic healthcare environment. It also explores the importance of fostering information cultures, change management models and team collaboration to drive technological adoption across healthcare settings. Finally, the chapter examines future trends, including the rise of AI, data sovereignty and emerging roles within digital health ecosystems. As nurses and midwives take on increasingly multidisciplinary roles in digital health, mastering leadership and management principles will be

essential for maintaining high-quality care and achieving meaningful health outcomes in the digital era.

LEARNING OUTCOMES

By the end of this chapter you will be able to:

1. Describe the role of digital health leadership and management in the development and running of digital healthcare systems.
2. Identify key leadership and management strategies to support digital health initiatives.
3. Demonstrate an understanding of governance frameworks related to digital health.
4. Recognise alignment of digital health initiatives with organisational goals and better healthcare outcomes.
5. Demonstrate an understanding of stakeholder engagement and communication to support digital health adoption and sustainability.
6. Identify and apply change, risk, quality and project management processes to support digital health implementation and benefit realisation.
7. Identify pathways into digital health leadership and management.

FRAMING QUESTIONS

1. What is the role of leadership in digital health?

2. What does it mean to effectively lead digital transformation in health care?
3. What are the essential leadership and management principles necessary to navigate the rapidly evolving digital health landscape?
4. What specific processes are important for health professionals to ensure that they are prepared to lead and manage the digital transformation in their work environment?
5. How can health professionals develop capacity for interdisciplinary collaboration, policy and governance and the need for continuous learning and adaptation in digital health?
6. How can nurses and midwives contribute to digital health strategies in the complex and dynamic healthcare ecosystem?
7. How can nurses and midwives contribute to an organisational culture that supports digital innovation in health care?
8. How can nurses and midwives meaningfully engage in digital innovation and the transformation in health care?

1. Introduction to digital health leadership and management

This chapter examines the scope of digital health leadership, highlighting its critical role in healthcare transformation through the integration of technologies such as electronic health records and telehealth. It emphasises the importance of effective leadership in driving innovation, while addressing risks like poor adoption. Transformational leadership theory is presented as a model for fostering team motivation and innovation. Legal and ethical challenges, such as data security, are discussed, alongside a case study on Bendigo Health's 2020 electronic patient record

implementation, which illustrates the impact of nurse-led leadership in digital transformation.

1.1 Definition and scope of digital health leadership and management

Digital health leadership and management involves guiding and overseeing the integration of digital technologies into healthcare systems to enhance patient care, operational efficiency and data management (Kruahong & Lachman, 2021). This encompasses strategic planning, implementation and evaluation of digital health initiatives, including electronic health records, telemedicine and health information exchanges (Kruahong & Lachman, 2021). Effective digital health leaders demonstrate a blend of clinical knowledge, technological expertise and change management skills to navigate the complexities of healthcare **digitalisation**. Conversely, poor leadership has been linked to implementation failure and poor uptake of digital health strategies (Laukka et al., 2020).

1.2 The importance of digital health leadership in the modern healthcare landscape

Digital health leadership is central to the successful development and integration of technology to enhance patient care, operational efficiency and data management within the context of health care (Laukka et al., 2022). Digital transformation in healthcare environments is challenging. Evidence suggests that the Australian health and health management workforce lacks sufficient readiness to effectively engage with digital health and **health informatics** (Brommeyer et al., 2023). Effective leadership, however, has been identified as a key enabler for the adoption and scaling of digital health innovations (Schlieter et al., 2022).

1.3 The role of nursing and midwifery leadership in digital health

The National Nursing and Midwifery Digital Health Capability Framework outlines essential competencies, including digital professionalism, leadership and advocacy,

and information-enabled care, to guide nurses and midwives in effectively integrating digital technologies into their practice (Australian Digital Health Agency, 2020b).

1.4 Leadership theories and application

Numerous leadership theories exist to guide healthcare leaders. Transformational leadership theory lends itself particularly to digital health adoption and effective change management in health care services. Transformational leadership theory emphasises the ability of leaders to inspire and motivate staff to achieve exceptional outcomes by transforming their beliefs, values and attitudes (Bass, 2012). Transformational leaders act as role models, demonstrating high ethical standards and earning trust and respect from their staff (Bass, 2012). They articulate a clear and compelling vision while also challenging assumptions and supporting a solutions-based approach among the team (Bass, 2012). Transformational leaders understand their teams and offer personalised support and mentorship, fostering growth and development (Bass, 2012). Transformational leadership is associated with improved organisational outcomes, enhanced job satisfaction and increased employee performance (Judge et al., 2004).

1.5 Qualities and strategies

Nurses and midwives who are leaders in the digital healthcare space must demonstrate key capabilities to influence the workforce and successfully achieve clinical transformation. Capabilities include effective collaboration and communication, **digital literacy** and technological competence, an innovation-focused approach, a commitment to their own learning and development and a focus on effective engagement with patients and communities (Hussain et al., 2023; Spanos et al., 2024).

1.6 Advocacy and influencing policy

Nurses and midwives play a central role as advocates in digital health, leveraging their clinical experience to influence policy and practice. Their involvement ensures that digital health initiatives are person centred and effectively integrated into healthcare systems (Janes et al., 2025). Nurses and midwives promote equity in digital health,

ensuring equitable access to digital health technologies, particularly for vulnerable populations. Their understandings of acute and community health dynamics enable them to identify and address barriers to digital inclusion, such as technological literacy or resource limitations (Chang et al., 2021).

1.7 Prioritising inclusivity, diversity and accessibility

Principles of inclusivity, diversity, and accessibility are central to digital health because they create equitable healthcare environments, ultimately leading to better healthcare delivery (Sharma et al., 2024; Tan, 2019). Nurses and midwives play a vital role in digital health transformation due to their clinical experience and direct patient care responsibilities. Their expertise allows them to provide valuable insights into the design and functionality of digital tools, ensuring these technologies address diverse needs and are user-friendly, practical, and effective in improving patient care (Tan, 2019). The digitisation of healthcare has also transformed how we care for different populations and the broader community (Sharma et al., 2024).

Unique challenges are faced by rural populations and First Nations people in accessing healthcare (Fitzpatrick et al., 2023; Woods et al., 2024). Engaging with these communities in developing and implementing digital health strategies ensures their needs are met. Tailored solutions, such as telehealth services and culturally sensitive tools, are necessary to address specific requirements (Woods et al., 2024). Additionally, strategies to overcome barriers like limited internet connectivity and digital literacy need to be addressed to ensure equitable access (Tagne et al., 2025). Leadership from nurses and midwives in digital health initiatives will help ensure that technology is integrated seamlessly into clinical workflows, ultimately leading to better healthcare delivery and patient safety.

1.8 Legal and ethical challenges and requirements

Nurses and midwives working in digitally enabled healthcare environments face several ethical challenges and legal requirements in ensuring digital transformational is safe, effective and meets required standards. This is particularly so for privacy, **confidentiality** and potential legal exposure through poor data entry practice,

including ignoring clinical decision support, late data entries and changes, failure to document or incomplete or inaccurate documentation, and copying and pasting notes (Balestra, 2017).

1.9 Case study: Digitisation in the Year of the Nurse – electronic patient record implementation, 2020

Bendigo Health, a regional health service located in the Central Goldfields of Victoria, Australia, is featured in this case study. This case highlights insights from Kate Renzenbrink, the Chief Clinical Informatics Officer, reflecting on the pivotal role nurses and midwives played in the successful implementation of an electronic patient record system in 2020.

CASE STUDY

In 2020, Bendigo Health implemented an electronic patient record (ePR) with the aim of providing improved access to patient information to support continuity of care. The health service has been a leader in **digital transformation** for nursing and midwifery, funding the role of Chief Nursing and Midwifery Informatics Officer (CNMIO) to ensure that nurses and midwives were represented in decisions impacting their professional practice. The majority of the digital health project team members, who were tasked with documenting the design and functionality required in the new platform, were nurses and midwives with expertise in clinical information systems, and they provided meaningful connections to the clinical teams they represented. As nurses and midwives make up the largest proportion of the Australian healthcare workforce and represent the largest group of staff using electronic medical records, this was reflected in the staff nominated to test the ePR to identify issues with workflow alignment, software defects and clinical risks. In parallel with the ePR implementation, Bendigo Health initiated an automated dispensing solution project to procure software and hardware to support closed loop medication management*. Workstations on wheels and handheld devices selected for use met usability criteria set out by the nursing team in consultation with their ICT team and vendors. Technology uptake by nurses and midwives is often impacted negatively by poor matching with nursing and midwifery work practices, so ensuring that the aspects of

these transformative projects has been nurse led supports successful implementation and adoption.
*Fully electronic medication management system (records, tracks all steps, order to administration)

ACTIVITY – REFLECTIVE QUESTIONS

- What pivotal role does each nurse and midwife have in the ePR implementation in this case study?
- Provide examples of why technology uptake is considered poor among clinical nurses and midwives.

2. Digital health management principles

2.1 Business alignment and healthcare goals

The National Nursing and Midwifery Digital Health Capability Framework (Australian Digital Health Agency, 2020b) outlines the capabilities required to support individuals and organisations in extending their digital health development. Five domains, listed under the nursing and midwifery digital capabilities, serve as a resource to align healthcare business development planning and delivery for person-centred, safe, quality and connected care. The five domains for digital health practice are described in Table 1.

Table 1: Digital health capability framework

Nursing and midwifery digital capabilities	Summary of the capabilities
Digital professionalism	Nurses and midwives will demonstrate professional attitudes and behaviours reflecting traditional nursing and midwifery professional standards through using digital tools professionally and personally.
Leadership and advocacy	Nurses and midwives will actively be involved in the leadership, development and advocacy for digital health at individual, local and national levels.
Data and information quality	Data quality is the backbone of digital health. Nurses and midwives have a crucial role to capture complete, timely and accurate data and manage it in a way that is accessible, reliable, private and secured, for different purposes in healthcare contexts.
Information-enabled care	Evidence-based care and continuity of care across settings require appropriate use and sharing of data and the creation and use of information to extend, develop and support evidence-based care.
Technology	Nurses and midwives can identify, recommend and use appropriate technology to improve patient outcomes more effectively and efficiently, and to implement policy and procedure to govern the use of digital tools in health care.

Source: Australian Digital Health Agency (2020b).

VIDEO

Watch Episode 2: Digital health benefits to understand how digital health aligns with the business of nursing and midwifery.

One or more interactive elements has been excluded from this version of the text.

You can view them online here: https://oercollective.caul.edu.au/digital-health-australia/?p=281#oembed-1

National Nursing and Midwifery Digital Health Capability Framework: Episode 2 – Digital health benefits

Source: AuDigitalHealth on YouTube.

2.2 Stakeholder engagement and communication, collaborating, and building and managing teams

To lead and manage the development of digital health, it is important to include stakeholders in planning and implementation. The National Digital Health Capability Action Plan (Australian Digital Health Agency, 2024a, p. 5) outlines the strategic priorities for effectively building digital health capabilities across the health workforce to respond to the needs of consumers now and in the future. The action plan has been built in partnership and consultation with government bodies, primary health organisations, professional and clinical peak bodies, digital health peak bodies, education and standards organisations, and industry. It sets out a roadmap for building a competent and capable digital health workforce.

Overall, there are three digital health workforce enablers that require collaboration in order to promote a shared **digital culture** and continuous learning:

- Frameworks and guidelines: to support consistent digital health capabilities and practice nationally
- Education and training: to enable the health workforce to upskill and adopt digital
- Regulation: to require the inclusion of digital health in regulated health education.

According to the National Digital Health Capability Action Plan Australian Digital Health Agency, 2024a, p.4), building a digitally capable health workforce will lead

to significant advancements in healthcare delivery and outcomes (see Table 2). Ultimately, these improvements will contribute to safer, more efficient and person-centred care across the health system.

Table 2: Building a digitally capable workforce

Benefits of a digitally capable workforce
Improved ability to diagnose, treat and manage health conditions
Reduction in clinical risk, including minimisation of adverse drug events
Enhancement of clinical workflows and the automation of routine and repetitive tasks
Improved patient flow and sharing of information throughout the health system
Enablement of care outside of hospital settings, in the community or at home
Increased transparency of health care
Improved population health management
Improved operational efficiencies

Source: Australian Digital Health Agency (2024a)

2.3 Risk management processes

Effective professional and therapeutic relationships build on mutual trust. While communication (e.g. data sharing) in digital health promotes more efficient and personalised care to achieve health goals, it is also a significant concern for information security and privacy. For example, personal and health information and healthcare provider information of 12.9 million individuals may have been exposed in the MediSecure cybersecurity incident. This highlights significant concerns about how best to protect the confidentiality and privacy of customer data in digital health. According to a systematic review to understand patient perspectives on health information exchange (Shen et al., 2019), privacy was the top concern among patients in 59 articles.

Since privacy and confidentiality are big concerns in digital health, cybersecurity must

be a solid risk management tool for any digital health system. In Australia, the Cyber Security Strategy 2022–2025 (Australian Digital Health Agency, 2022) sets guiding principles, approaches and areas for action to be taken on cybersecurity. These are described in Table 3.

Table 3: Cybersecurity guiding principles

Focus areas for cybersecurity and risk management	Guiding principles for cybersecurity and risk management
Business led	Cybersecurity services and solutions are aligned with strategic agency objectives and clinical outcomes
Future focused	Staying ahead of the evolving digital healthcare environment, ready to securely support the next horizon of digital health
Prioritised effort	Resources are focused on maximising value for the Agency and the Australian healthcare ecosystem
Security by design	Creating a development, security and operations environment that integrates security into every stage of product development
Focus areas	Governance and operations, security culture, workforce investment, capability and proportionality

Source: Australian Digital Health Agency (2022)

2.4 Quality management tools and techniques

Digital health generates a large volume of healthcare information for administrative, educational, research and clinical purposes. Therefore, information quality is vital and relevant to patient safety. Fadahunsi et al. (2021) conducted a systematic review to synthesise information quality frameworks for digital health technologies and identified a clinical information quality (CLIQ) framework for digital health involving 13 unique dimensions (Figure 2).

Figure 2: Dimensions of quality management (adapted from Fadahunsi et al., 2021) by T. Parrish, K. Raghunathan, K. Ho and F. Faulks is used under a CC BY-NC-SA licence

The work of Fadahunsi et al. (2021) provides universal coverage on information quality. On top of information quality, the Clinical Governance Framework for Digital Health (Australian Digital Health Agency, 2020a) provides an even wider coverage on quality management and is an important tool for clinical safety, quality and continuous improvement in the delivery of health and care, including through health technologies. The governance framework has five guiding principles:

- Leading with our people

- Systems safety and quality improvement
- Person centredness
- Partnership
- Evidence-based practice.

VIDEO

Watch The role of clinical governance in advancing digital health transformation in global health systemsto understand the growth in demands for care, the challenge of workforce sustainability and shifts in consumer expectations.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://oercollective.caul.edu.au/digital-health-australia/?p=281#oembed-2

The role of clinical governance in advancing digital health transformation in global health systems

Source: AuDigitalHealth on YouTube.

2.5 Process reengineering, redesigning workflows and digital solutions

First in this section, watch the following video to understand the possible digital solutions in a healthcare context.

VIDEO

Watch Intelligent automation in health careto explore digital solutions on healthcare workflow and the benefits they offer.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://oercollective.caul.edu.au/digital-health-australia/?p=281#oembed-3

Intelligent automation in health care

Source: Excellarate is now Encora on YouTube

Given the advances in digital technology, there is potential for workflow automation in digital health, offering opportunities to optimise work processes, reduce time and cost, assure patient safety, and improve quality of care and communication. A recent systematic review (Layadi, 2023) showed that healthcare automation is an emerging research area. An example is the protocol of Frasquilho et al. (2021) on using digital algorithms to support stepped care for mental health.

ACTIVITY

Read Protocol for the implementation and assessment of 'MoodUP': A

stepped care model assisted by a digital platform to accelerate access to mental health care for cancer patients amid the COVID-19 pandemic (Frasquilho et al., 2021)

Discuss the benefits of using digital algorithms to support stepped care for mental health.

This example shows the potential of digital solutions, from primary prevention to tertiary prevention. However, it is important to consider levels of automation because a main tenet of health care is to be person–centred, for which human interaction and knowledge is often required. According to Zayas-Cabán et al. (2021), there are three levels of automation, depending on the nature of the task. These levels are described in Table 4.

Table 4: Levels of work automation

Low automation	Semi-automated	Fully automated
• Manual tasks repeat infrequently • Roles and responsibilities shift and are not well defined • Human cognition or intervention required often • Low technology sophistication	• Some manual tasks repeat • Some roles and responsibilities are well defined • Human intervention is defined for specific tasks • Technical sophistication increases	• Manual tasks repeat frequently • Roles and responsibilities are concrete and well defined • Tasks are simple and clear • Technology and analytics are advanced

Source: Zayas-Cabán et al. (2021, p. 690)

VIDEO

Watch Case study: How HM Hospitals improve patient care with automation to understand how automation benefited internal process control, reduced administrative tasks and kept the focus on delivering great patient care in this hospital.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://oercollective.caul.edu.au/digital-health-australia/?p=281#oembed-4

How HM Hospitals improved patient care with automation

Source: UiPath on YouTube

3. Leading digital transformation in health

3.1 Understanding components of change

Nurses and midwives play varied and important roles in the implementation of new digital platforms like electronic medical records (see the Bendigo Health case study). Successful change initiatives require effective communication and recognition of organisational change from leaders as a long-term, multi-step approach (Attaran et al., 2019). To reap the benefits of a digital workplace, organisations must prepare for significant change, adopt digital technologies and use data to create positive, intelligent environments for employees. Nurses and midwives can embrace change as a way of improving health care for patients. Understanding the reasons for change is also a crucial step to accepting change in any organisation. Figure 3 illustrates the four essential elements to managing organisational change.

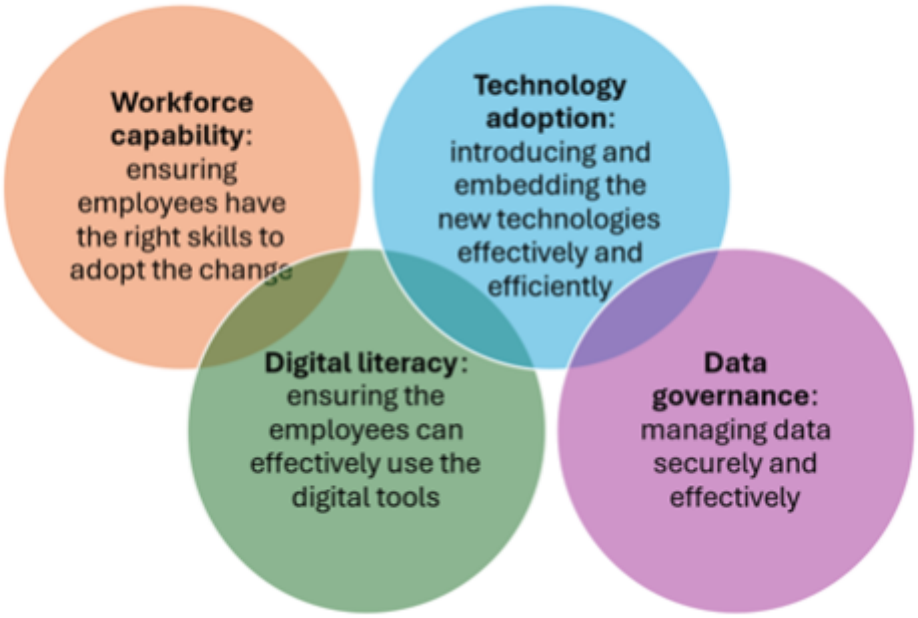

Figure 3: Elements to managing organisational change (adapted from Marsh et al., 2018) by T. Parrish, K. Raghunathan, K. Ho and F. Faulks is used under a CC BY-NC-SA licence

VIDEO

Watch What is the future of digital health? for a closer look at change and adoption of evolving technology.

Identify three areas of digital health change that have occurred in the last five years.

One or more interactive elements has been excluded from this version

of the text. You can view them online here: https://oercollective.caul.edu.au/digital-health-australia/?p=281#oembed-5

What is the future of digital health?

Source: AuDigitalHealth on YouTube

3.2 Program and project management methods and tools

It is increasingly evident that digital solutions will be the foundation of modern health care, so the successful implementation of digital health interfaces is crucial (Dendere et al., 2021). Effective project management tools and methods are essential for the smooth transition and implementation of projects like electronic medical records in health care. Figure 4 shows some examples of digital health implementation that directly impact nursing and midwifery work. Understanding these project management aspects helps nurses and midwives facilitate the effective adoption of digital solutions in health care.

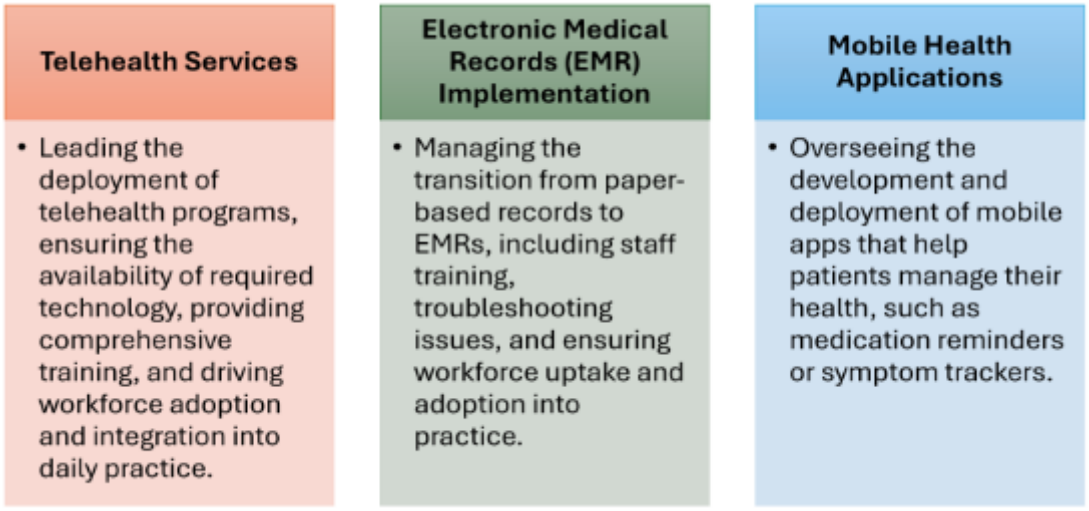

Figure 4: Examples of digital health implementation impacting nursing and midwifery work (adapted from Ndlovu et al., 2021) by T. Parrish, K. Raghunathan, K. Ho and F. Faulks is used under a CC BY-NC-SA licence

3.3 Value management and benefit realisation from digital health initiatives

Value management and benefit realisation are crucial concepts that allow investments in healthcare technologies and digital solutions to lead to tangible improvements in patient care, operational efficiency and effective systems uptake. Value management is the process of identifying, maximising and sustaining the value of digital health initiatives throughout their lifecycle (Mathews et al., 2019). The focus is to align digital health projects with the organisation's goals, ensuring that these projects deliver tangible, measurable outcomes to benefit patients and healthcare organisations. Figure 5 illustrates how this can be achieved.

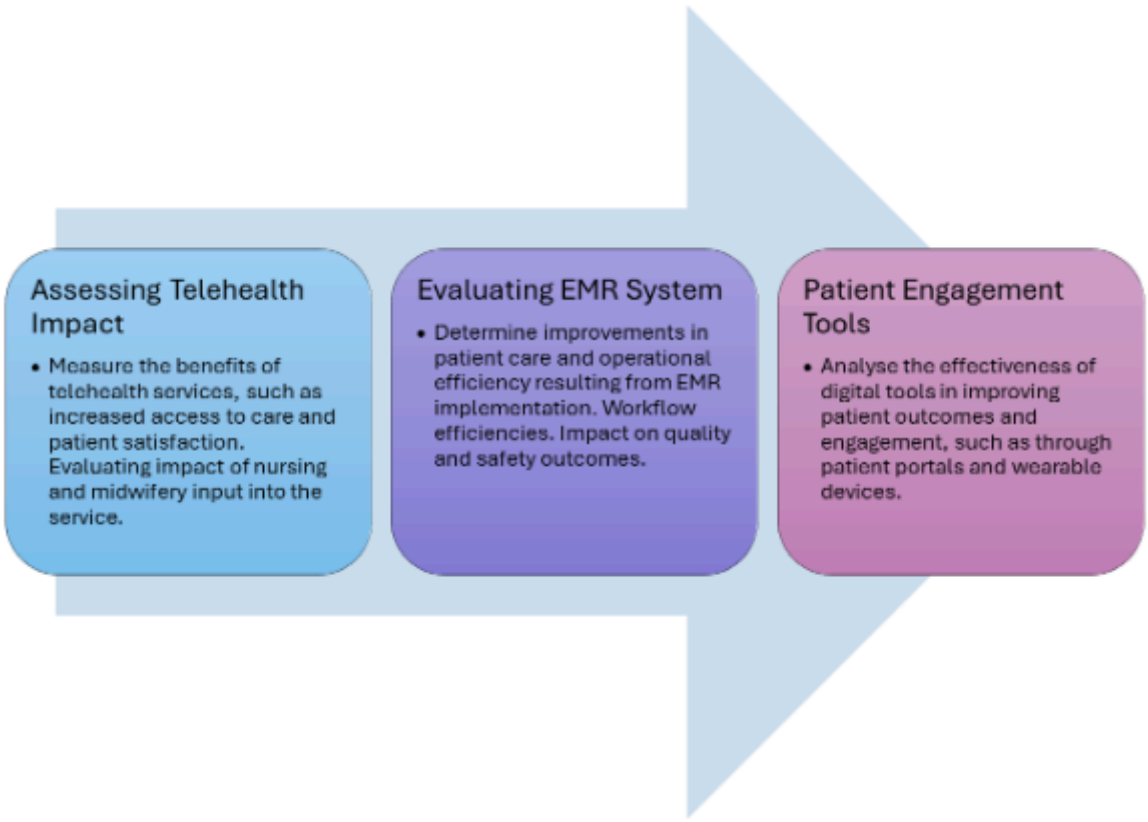

Figure 5: Evaluating value and benefit realisation of digital health initiatives (adapted from Mathews et al., 2019) by T. Parrish, K. Raghunathan, K. Ho and F. Faulks is used under a CC BY-NC-SA licence

3.4 Information culture

Fostering an information culture in healthcare organisations is essential for making decisions and enhancing data literacy. In relation to digital health, an information culture ensures that data becomes a normal part of daily operations, decision-making processes and patient care strategies. Figure 6 shows some examples of how this works effectively. Digital transformation is primarily about people, not just technology. It necessitates organisational change that is supported by leadership and fuelled by fundamental shifts in workplace culture (Abbu et al., 2022).

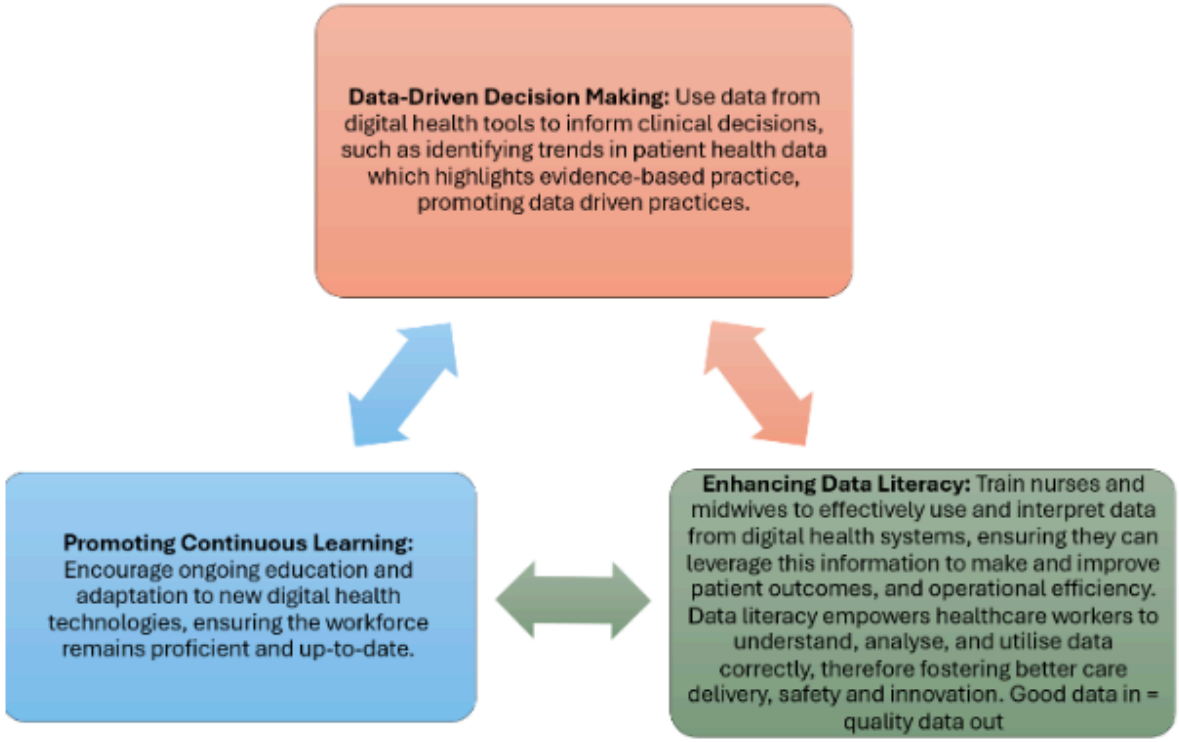

Figure 6: Fostering an information culture in health care (adapted from Stoumpos et al., 2023) by T. Parrish, K. Raghunathan, K. Ho and F. Faulks is used under a CC BY-NC-SA licence

4. Future directions, trends and challenges in navigating digital transformation

4.1 Digital transformation and new ways of working

Leaders, nurses and midwives must understand digital transformation in health care, as it will impact how we work in the future (Aroles et al., 2021). Embracing change will prepare the workforce to be at the forefront of modern health care. This change is driven by new technologies, interdisciplinary person-centred care, evolving expectations and data automation (Janssen et al., 2024; Pang et al., 2023). In recent years, technologies like the internet of things (IoT), robotics, AI, big data and blockchain have significantly impacted health care through automation and efficiency.

The so-called ‘fifth industrial revolution’ further combines human-centric technologies for flexible, adaptive and sustainable systems (Pang et al., 2023). Personalised and connected health care with real-time data analysis is becoming more common. As organisations become increasingly digitally focused, the skills for a ‘digital culture’ include digital ways of thinking and working (Australian Digital Health Agency, 2024a). This requires engaged and capable leaders and a workforce to support the transition.

4.2 Technological trends in health care

Table 5 summarises significant trends that highlight the transformative impact of technology on health care. These advancements underscore the importance of integrating advanced digital tools and systems to enhance patient care, streamline workflows and create operational efficiency. One of the most significant trends is the increasing influence of AI and machine learning (ML) models. As AI continues to evolve, its integration into various healthcare aspects will deepen. Human–machine collaboration, with robotics and AI systems working alongside humans, will enhance productivity and safety. The advent of 6G technology will further fundamentally transform health care with the promise of unprecedented speed, reliability and connectivity.

Table 5: Some innovative technologies and their healthcare applications

Enabling technology trends	Applications
Artificial intelligence and machine learning models	Revolutionising diagnostics, patient monitoring, treatment development and care delivery. Helps with early disease detection, predicting patient outcomes and tailoring treatments based on real-time data. Streamlines hospital operations, reducing costs and enhancing efficiency. (Tiase & Hobensack, 2023)
Internet of things	Remote healthcare delivery facilitated through wearable devices and telehealth Acquisition of real-time data and analysis. Helps prompt data collection and timely response. (Abiodun et al., 2022)
Digital twins	Virtual replicas of physical systems and patients using their data for real-time monitoring to simulate disease progression and precision medicine. Supports personalised health care. Targeted therapies, testing and prediction to improve diagnosis and treatment. (Wickramasinghe et al., 2021)
6G technology	Will transform health care with unprecedented speed, reliability and connectivity to support real-time data exchange and collaboration. Supports telemedicine and the use of wearable healthcare devices, particularly in remote and underserved areas. (Dao, 2023)

Enabling technology trends	Applications
Blockchain technology	Data encryption, distribution and information sharing to enhance security, and prevent cyber attacks and data breaches. (Abiodun et al., 2022)
Collaborative robots (cobots) and automation	For work efficiency, productivity and safety. Big data analysis and predictions. (Holland et al., 2021)
Big data and analytics models	Enhances data quality, manages large datasets, improves accuracy and reliability of predictions to make better-informed healthcare decisions. (Pang et al., 2023)
Nanotechnology	To develop new diagnostics and therapeutic tools. Molecular imaging and nanomedicine. (Woźniak et al., 2022)
Cloud and Edge computing	Enables timely and remote access to healthcare data from mobile devices. Helps timely treatment and interventions. (Wan et al., 2022)

4.3 Threats and opportunities

Emerging work practices across various sectors and the ever-evolving work environment introduce new challenges and opportunities (Aroles et al., 2021). The COVID-19 pandemic fast-tracked the introduction of many advanced technologies into health care, but it also highlighted significant gaps in digital health infrastructure

(Tiase & Hobensack, 2023; Woods et al., 2023). Table 6 highlights key threats and opportunities.

Table 6: Threats and opportunities of digital transformation in health care

Element	Threat	Opportunity	Outcome
Nursing and midwifery practice	Need for appropriate workforce development	Enhanced clinical decision-making through AI decision support systems	Improved patient care and efficiency
Data security	Potential for data security breaches and misuse	Improved patient care and efficiency through technology capabilities	Enhanced trust and reliability in digital systems
AI integration	Need for responsible integration and understanding of AI limitations	Addressing healthcare challenges like access to care and administrative burdens	Efficiency, productivity, reduced errors and improved patient outcomes
Data ownership	Debate over data ownership and sovereignty	Greater transparency and control for consumers over their personal data	Increased patient engagement and trust
Standardisation and interoperability	Data inconsistency due to multiple terminologies	Seamless information exchange and improved healthcare outcomes through standardised terminologies	Enhanced coordination and quality of care

Element	Threat	Opportunity	Outcome
Health equity (techquity)	Disparities in access to technology and digital literacy	Bridging health equity gaps and improving access to care and patient outcomes	More equitable healthcare delivery

Sources: Australian Digital Health Agency, 2024b; Janssen et al., 2024; Pang et al., 2023; Woods et al., 2023

4.4 Strategies to manage digital transformation

Nursing and midwifery leaders, and the workforce more broadly, can play a crucial role in maximising the benefits of digital transformation in health care. Concerns and benefits arise because of the increasing role of technology. To ensure the benefits of digital transformation in health care outweigh the threats, it is essential to take proactive and strategic steps. Table 7 provides more information on specific strategies to navigate the digital transformation.

Table 7: Strategies to effectively manage the digital transformation

Workforce, technology and techquity needs	Strategies to address workforce, technology and techquity needs
Nursing and midwifery practice	Create and implement training programs focused on technology, information, data and AI literacy. Undertake continuous education and professional development to keep up with technological advancements.
Data security	Develop robust cybersecurity measures to protect sensitive patient data. Undertake regular security audits and updates to maintain system security.
AI integration	Provide thorough education on AI limitations and appropriate use for health professionals. Establish and enforce ethical guidelines for AI use in clinical settings.
Data ownership	Create transparent policies for data collection, sharing and use. Empower individuals by giving them more control over their personal data.
Standardisation and interoperability	Adopt standardised health terminologies like *SNOMED-CT and *ICNP. Develop frameworks for seamless information exchange across the different clinical and healthcare systems.
Health equity (techquity)	Work to ensure equitable access to technology for all patients. Provide resources and training to improve digital literacy among healthcare providers, staff and consumers.

*Systemised nomenclature of medicine – clinical terms; International Classification for Nursing Practice.

Sources: Australian Digital Health Agency, 2024b; Janssen et al., 2024; Pang et al., 2023; Woods et al., 2023

4.5 Evolving healthcare roles

As digital transformation progresses, healthcare roles are also changing. Health professionals must now integrate digital competencies into their traditional skill sets. New digital health roles are emerging, such as informaticians, data scientists, digital

health strategists and telehealth coordinators. Educating future graduates for new roles and upskilling the current workforce will be crucial to ensuring that technology adoption is sustainable and supports quality healthcare delivery. This change requires new skills, adaptation to a fast-changing environment, collaboration and a transdisciplinary perspective (Australian Digital Health Agency, 2024b). Leaders and the health workforce must work closely with IT professionals, data scientists and other healthcare leaders to implement and optimise technology solutions in the digital health ecosystem.

4.6 Implications for leadership and management

What are the implications of this digital transformation for practice? Leaders must embrace modern technologies and foster a culture of innovation and continuous improvement. This shift requires incorporating digital literacy, data-driven decision-making, and an understanding of emerging technologies that affect nursing and midwifery work. Driving these changes requires contributing to the strategic vision for workforce education and policy development while addressing ethical issues related to digital health.

Further reading

Refer to the article by Pang et al. (2023) for what the future of work, the workplace and the workforce might involve. Take note of Figure 3 in the article.

Towards a new paradigm for digital health training and education in Australia: Exploring the implication of the fifth industrial revolution

5. Conclusion

Digital transformation in health care presents challenges and opportunities for nursing and midwifery leadership. Embracing technology, continuous learning and ethical practices can drive innovation and enhance patient care. Cultivating a digital culture

requires not only innovation. Interdisciplinary collaboration and data-driven decisions are also crucial in this process.

KEY TAKEAWAYS

1. Importance of leadership in digital health
    - Essential for successful technology integration in health care
    - Aims to improve patient care, operational efficiency and data management
2. Nursing and midwifery leadership
    - Critical for adopting digital health innovations
    - Aligns with healthcare goals like person-centred care and improved patient outcomes
3. Leadership theories and approaches
    - Transformational leadership provides insights for guiding change
    - Encourages a positive, collaborative healthcare team environment
4. Competency development for nurses and midwives
    - Digital literacy, communication and policy advocacy skills are crucial
    - Must ensure equitable access and address ethical and legal challenges
5. Key elements for digital health success
    - Stakeholder engagement and clear communication
    - Adherence to privacy and cybersecurity standards

6. Challenges and opportunities
    - Digital technologies offer opportunities for person-centred care and equity
    - Potential challenges include cybersecurity threats
7. Leadership responsibilities
    - Stay updated on digital health applications
    - Integrate new roles (e.g. digital health strategists)
    - Collaborate with stakeholders and uphold ethical principles
8. Workforce development
    - Continuous learning and collaboration build a digitally capable workforce
    - Drives safer, more efficient and person-centred care.

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3. Interpreting and understanding data quality in digital health

Forthcoming content

This section will address elements from Domain 3 (Data and information quality) of the National Nursing and Midwifery Digital Health Capability Framework which include:

- data capture
- data management
- data lifecycle.

Please express your interest here to be notified when this content is published. We welcome EOIs to peer review or co-develop these chapters.

4. Digital health care contexts

Forthcoming content

This section will address elements from Domain 4 (Information enabled care) of the National Nursing and Midwifery Digital Health Capability Framework which include:

- data sharing
- information creation and use
- extending practice.

Please express your interest here to be notified when this content is published. We welcome EOIs to peer review or co-develop these chapters.

5. Digital health and future technologies

Forthcoming content

This section will address elements from Domain 5 (Technology) of the National Nursing and Midwifery Digital Health Capability Framework which include:

- appropriate technologies
- digital health governance
- problem solving.

Please express your interest here to be notified when this content is published. We welcome EOIs to peer review or co-develop these chapters.

Review statement

La Trobe eBureau open publications rely on mechanisms to ensure that they are high quality, and meet the needs of all students and educators. This takes the form of both editing and double peer review.

Copyediting

This publication has been reviewed by an IPED accredited editor to improve the clarity, consistency, organization structure flow, and any grammatical errors.

Peer review

Two rounds of peer review were completed for this publication in 2024.

The peer review was structured around considerations of the intended audience of the book, and examined the comprehensiveness, accuracy, and relevance of content, as well as longevity and cultural relevance.

Changes suggested by the editor and reviewers were incorporated by the author in consultation with the publisher.

The Editors would like to thank the reviewers for the time, care, and commitment they contributed to the project. We recognise that peer reviewing is a generous act of service on their part. This book would not be the robust, valuable resource that it is were it not for their feedback and input.

Version History

This page provides a record of changes made to this textbook. Each set of edits is acknowledged with a 0.01 increase in the version number. The exported files for this toolkit reflect the most recent version.

If you find an error, please contact eBureau@latrobe.edu.au.

Version	Date	Change	Details
1.01	12 May 2025	Tranche 1 chapters published: 1.2, 1.3, 2.0, 2.3	
1.02			

Glossary

Artificial Intelligence (AI)

AI is the simulation of human intelligence in machines designed to perform tasks like learning, reasoning and decision-making. It powers technologies such as chatbots, predictive analytics and autonomous systems.

Asynchronous

Happening at different times.

Clinical informatics / health informatics

An interdisciplinary field that focuses on the effective use of biomedical data, information and knowledge for scientific research, problem-solving and decision making with the goal to enhance human health.

Jen, M. Y., Mechanic, O. J., & Teoli, D. (2023). Informatics. In StatPearls. StatPearls Publishing.

Confidentiality

The ethical obligation to protect private and sensitive information from unauthorised disclosure.

Digital communication in health care

A two-way functionality involving data sharing between a sender and a receiver. It can be synchronous or asynchronous for the purpose of delivering or receiving health and medical care.

Digital culture

Involves digital ways of thinking and working, to drive innovation, efficiency, productivity and user experience.

Australian Digital Health Agency. (2024). Workforce Strategy 2021–2026. Australian Government. https://www.digitalhealth.gov.au/sites/default/files/documents/agency-workforce-strategy-2021-2026.pdf.

Digital footprint

The traceable record of an individual's online activities, including posts, accounts and browsing history.

Digital health

The application of information and communication technologies in the fields of health care and medicine.

Jandoo, T. (2020). WHO guidance for digital health: What it means for researchers. Digital Health, 6, 2055207619898984–2055207619898984. https://doi.org/10.1177/2055207619898984.

Digital health applications

Systems, tools and services powered by information and communication technology that are used to treat patients and gather and share their health information.

Australian Institute of Health and Welfare

Digital health leadership

The process of guiding and influencing the development, implementation and strategic direction of digital health technologies and solutions in healthcare systems.

Laukka, E., Pölkki, T., & Kanste, O. (2022). Leadership in the context of digital health services: A concept analysis. Journal of Nursing Management, 30(7), 2763–2780. https://doi.org/10.1111/jonm.13763.

Digital literacy

Refers to the ability to effectively and critically navigate and create information using a range of digital skills.

Tinmaz, H., Lee, Y.-T., Fanea-Ivanovici, M., & Baber, H. (2022). A systematic review on digital literacy. Smart Learning Environments, 9(1), 21. https://doi.org/10.1186/s40561-022-00204-y.

Digital safety

The measures taken to protect personal and professional information from risks in the online environment.

Digital transformation

The integration of digital technology into all areas of a business, fundamentally changing how it operates and delivers value to customers.

Andriole, S. J. (2020). The hard truth about soft digital transformation. IT Professional, 22(5), 13–16. DOI: 10.1109/MITP.2020.2972169.

Digitalisation

The process of converting analogue information into a digital format, enabling the content to be programmed, addressed, traced and communicated.

Fahndrich, J. (2023). A literature review on the impact of digitalisation on management control. Journal of Management Control, 34(1), 9–65. https://doi.org/10.1007/s00187-022-00349-4

Electronic medical record system

A digital platform that stores and manages patient health information, replacing traditional paper-based medical records and allowing healthcare providers to access and update patient details electronically.

Electronic referral (eReferral)

Standardised form to send a referral to an electronic medical record system; linked also to electronic medical records.

Electronic referral management system

Provides outpatient and community services with real-time link to referral management and triaging; also sends notifications to patients and referrer – in this way it keeps everyone informed.

eProfessionalism

The demonstration of professional behaviours and standards online.

Human-centric technologies

Technology developments that focus on the needs and preferences of patients, healthcare professionals and other stakeholders.

Pang, T. Y., Lee, T.-K., & Murshed, M. (2023). Towards a new paradigm for digital health training and education in Australia: Exploring the implication of the fifth industrial revolution. Applied Sciences, 13(11), 6854. https://www.mdpi.com/2076-3417/13/11/6854.

Malware

Malicious software that disrupts, damages or gains unauthorised access to systems or data.

Multi-factor authentication (MFA)

An added security measure requiring multiple forms of verification to access an account.

Phishing

A cyberattack designed to steal sensitive information by pretending to be a legitimate or trustworthy source.

Synchronous

Happening at the same time.

World Health Organization

Founded in 1948, WHO is the United Nations agency that connects nations, partners and people to promote health, keep the world safe and serve the vulnerable.