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Methodology for the Development of the Australian National Nursing and Midwifery Digital Health Capability Framework

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Abstract. Internationally healthcare organisations and governments are grappling with the issue of upskilling healthcare workforces in relation to digital health. Significant research has been undertaken in relation to documenting essential digital health capability requirements for the workforce. In 2019 the Australian Digital Health Agency funded work by the Australasian Institute of Digital Health to develop a National Nursing and Midwifery Digital Health Capability Framework. This paper describes the methodological approach used in the development of the Framework.

Keywords. Capability framework, digital health, health workforce, nursing, midwifery

1. Introduction

Increasing the digital health capability of the health workforce has been globally recognised as an issue. As nursing and midwifery are the largest disciplines within the healthcare workforce and are major users of digital health, they are ideally situated to lead reform throughout all levels of the health and aged care system. Nurses and midwives are highly regarded, highly educated, flexible, and responsive to individual and community needs and so can have major impact on the success or failure of healthcare reform. As such the nursing and midwifery workforce is ideally positioned to

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lead digital transformation across clinical environments. In 2017, recognising the importance of nurses and midwives in the Australian digital health journey the Australian College of Nursing (ACN), Health Informatics Society of Australia (HISA) and Nursing Informatics Australia (NIA) worked together to develop a Nursing Informatics Position Statement [1].

The Australian Digital Health Agency (the Agency) through their National Digital Health Strategy [2] and National Digital Health Workforce and Education Roadmap [3] acknowledge the need for strategies that prioritise enablement of the development of digitally capable workforces. During 2019 the Agency recognised the opportunity posed by 2020 being the International year of the Nurse and Midwife in delivering a digital health capability framework for nurses and midwives across all settings. The project was led by the Australasian Institute of Digital Health (AIDH), formerly HISA, in collaboration with key national nursing and midwifery organisations. Commencing in mid 2019, the final version of the National Nursing and Midwifery Digital Health Capability Framework (the Framework) was published in October 2020 by the Agency [4]. This paper describes the methodology used in the development of the Framework.

2. Methodology

The development methodology used a staged approach as described in the sections below. The project governance, in addition to the project team, included an advisory committee which consisted of representatives from key nursing and midwifery organisations: the Australian College of Midwives (ACM), the Australian College of Nursing (ACN), the Australian Nursing and Midwifery Federation (ANMF), Australian Nursing and Midwifery Accreditation Council (ANMAC), Australian Primary Health Care Nurses Association (APNA), Congress of Aboriginal and Torres Strait Islander Nurses and Midwives (CATSINaM), Digital Health Cooperative Research Centre (DHCRC), Australasian Institute of Digital Health Nursing and Midwifery Special Interest Group (AIDH-NaM), Nursing and Midwifery Board of Australia (NMBA), the Queensland Chief Nursing and Midwifery Officer (CNMO) as a conduit for information sharing with the Australian and New Zealand Chief Nursing and Midwifery Officers, the Agency's representatives including the Chief Clinical Information Officer (a nurse), an international expert, and a consumer representative. The advisory committee reviewed outputs at each stage of the project.

2.1. Review of Evidence

An initial review of the published research and evidence relating to both digital health capabilities/competencies and nursing and midwifery specific digital health competencies was undertaken. The review identified a body of research and discussion in relation to nursing informatics competencies, for example [5-7]. However, most of these competencies are specific to specialty groups of nurses and tend to be prescriptive and task oriented. Additionally, whilst university undergraduate curricula have a complete set of core nursing competencies [8, 9] these often fail to address or include new technological developments. It is essential that digital health is considered and incorporated into education [10-12].

Australian nursing and midwifery education uses the term capability reflecting an individual's ability to demonstrate self-efficacy and take responsibility for their actions

and education [13]. This change in terminology is also evident in the Registered nurses standards for practice [14] and the Midwife standards for practice [15].

Through the review of the evidence a number of common domains were identified:

- Technology needs to be understood and used appropriately (Technology)
- Data quality must be present (Quality Data)
- Care must be data-driven through rigorous data analysis (Data-driven Care); and
- Interfaces need to meet the socio-technological needs of nurses and midwives and their patients (Socio-Technological Interface).

2.2. Mapping the Domains

Using an iterative approach the initial domains were compared with and mapped against key related frameworks: the National Health Service (NHS) capability framework [16], Australia's Enrolled Nurse [17], Registered Nurse [14] and Midwife [15] Standards, and Brunner's [18] capability framework. Initial mapping against original proposed domains of Technology, Quality Data, Data-Driven Care, and Socio-Technological Interface identified that the domain of Socio-Technological Interface required refinement. It emerged that many of the elements in other capability frameworks related to professionalism and other uses of data. This resulted in the inclusion of the new domains of Digital Professionalism and Leadership and Advocacy.

Once these new domains were identified a further mapping process was undertaken against the five revised domains. This allowed the identification of subdomains within each domain presented below.

Domain 1 Digital Professionalism (Professional standards are maintained in the digital environment). Nurses and midwives demonstrate attitudes and behaviours reflecting traditional professionalism standards when utilising digital media both professionally and personally.

- 1.1 Procedural knowledge: Nurses and midwives understand the procedural and legal requirements for using digital media in healthcare.
- 1.2 Professional development: Nurses and midwives use digital media to achieve and maintain professional development requirements.
- 1.3 Digital identity: Nurses and midwives use digital media to develop and maintain their online image and reputation.

Domain 2 Technology (Technology needs to be understood and used appropriately). Nurses and midwives access and use available technologies appropriately to deliver safe and quality care, and to ensure information availability.

- 2.1 Available/appropriate technologies: Nurses and midwives recognise the appropriate digital technologies for their environment and utilise these where available.
- 2.2 Information systems governance: Nurses and midwives recognise the importance of policy and procedures governing the information systems used within their workplace.
- 2.3 Problem solving: Nurses and midwives are able to undertake some degree of problem solving in the use of digital technologies in their practice.

Domain 3 Quality Data (Data quality must be present). Nurses and midwives capture, create and record increasingly large quantities of clinical data. Digital health relies on quality data for information management, and nurses and midwives have a critical role.

- 3.1 Data lifecycle: Nurses and midwives recognise that data have different uses or usefulness at various points within healthcare.
- 3.2 Data capture: Nurses and midwives are crucial in the capture of quality data.
- 3.3 Data management: Nurses and midwives are important in the processes for ensuring the accessibility, reliability, and timeliness of the data within healthcare.

Domain 4 Information supported care (Care must be supported by rigorous data analysis and critical appraisal). The evidence-based actions and behaviours of nurses and midwives increasingly rely on the appropriate use of complex data. Information supported care is central to modern practice and requires the development of a validated knowledge-base through rigorous data analysis to inform quality clinical decision making and extend nursing knowledge.

- 4.1 Data sharing: Nurses and midwives recognise the appropriate uses for, and sharing of, digital data within healthcare.
- 4.2 Information creation and use: Nurses and midwives use data from a wide range of sources to create information for themselves and other healthcare providers and users to support care.
- 4.3 Extending practice: Nurses and midwives use information to develop and extend nursing knowledge and support evidence-based care.

Domain 5 Leadership and Advocacy (Digital health leadership and advocacy supported by clear policy). As the largest health professional groups, nurses and midwives must be actively involved in the leadership, policy development and advocacy for digital health at individual, local and national levels.

- 5.1 Patient Technology Advocacy: Nurses and midwives are able to advocate for patients in relation to digital health use within their workplace.
- 5.2 Leadership within organisation: Nurses and midwives are visible and active players in the digital health decision-making within their organisations.
- 5.3 Digital leadership in Nursing and Midwifery professions: Nurses and midwives must provide active leadership in to ensure the professions have input into national digital health decisions.

Additionally, a set of three capability levels was proposed. The capability levels were developed through consultation and build upon the levels proposed in the *APNA Career and Education Framework for Nurses in Primary Health Care* [19]. These were:

- Formative level: reflecting nurses and midwives who are becoming aware of the move toward digital health and the implications for practice.
- Intermediate level: reflecting nurses and midwives who are developing increased confidence, knowledge, skill and capacity in the use of digital health in their practice.
- Proficient level: reflecting nurses and midwives who are assuming leadership in the use and championing of digital health within both practice and the broader nursing/midwifery profession.

2.3. Development Workshop

An initial Framework was developed and presented for consultation at design workshops in December 2019. The design workshops were held simultaneously in Adelaide, Brisbane, Melbourne and Sydney commencing with an explanation of the Framework and the purpose of the workshops delivered via video-link. Forty-nine participants

attended the workshops and reflecting their feedback a revised version of the Framework was developed for broader consultation.

2.4. General Consultation

Nationally, through the major nursing and midwifery organisations, nurses and midwives were invited to attend a range of webinars and consultation sessions relating to the draft Framework. Additionally, written submissions were called for and a public survey was undertaken during the period February to March 2020. Contributions were received from nurses, midwives, educational experts, digital health groups, and nursing and midwifery organisations at various stages throughout the consultation process. All feedback was collated and considered by the Advisory Committee for inclusion in the revised final Framework.

The consultation period was supported by a media release issued from the Agency at the commencement of the consultation period and through a range of regular social media posts from the Agency, AIDH, and supporting professional bodies and associations. Professional bodies and associations represented on the Advisory Committee issued invitations to members and their networks about the project and the opportunity to participate in consultation. Unfortunately, due to the COVID-19 pandemic, the ensuing nursing and midwifery workload demands and changing priorities it was impossible to conduct all the intended face-to-face consultation in March 2020. Virtual consultations were undertaken as groups or individual organisations, for example presentations to the Coalition of National Nursing and Midwifery Organisations (CoNNMO).

A targeted approach to engage a wide range of stakeholders was managed by the AIDH to include Federal and State Government, large employers, hospital groups, primary care, aged and community care, Aboriginal and Torres Strait healthcare workers, regional and remote healthcare providers, nursing informatics groups, tertiary educators, clinical software vendors, and others working across the sector with an interest. The Agency invited their Clinical Reference Leads [20] and relevant staff to attend and provide feedback in consultation sessions.

2.5. Online Survey

An online survey was developed by the project team and hosted on the Agency's approved digital survey platform to provide the broadest opportunity for consultation. The online survey was open from the 3rd February to the 13th March 2020. A total of 246 responses were received this included 233 from individuals and 13 from organisations. Of the 246 responses 160 were complete and able to be used for feedback and analysis. This included 151 from individuals and nine from organisations.

The response rate was deemed acceptable and representative of nurses and midwives based upon demographic data. However, there were some areas that lacked representation. For example, there were few responses from nurses working in aged care and some states delivered few responses. These were identified early in the data collection phase and targeted specific requests for responses to the survey were sent to these groups. Unfortunately, there was limited response to these requests.

Overall, the respondents were positive in relation to the framework. It was determined that any statement which gained less than 75% agreement would be explored

as potentially requiring change. Through the analysis a few key areas that need minor adjustment were identified, these were primarily minor textural adjustments.

When answering the questions on the potential usefulness of the framework there was less than 75% agreement by both organisations and individuals to the statement “*the framework is useful for employers to identify individual capability of nurses and midwives*”. There was also less than 75% agreement by organisations to the two statements “*The framework is useful for individuals to self-assess their digital health capabilities*” and “*The framework provides clarity that will allow me to assess my level of digital health capability at different points in my career.*”

A significant number of written comments in the survey were received, these were thematically analysed to identify commonality and potential adjustments to the Framework. Respondents wanted to see more emphasis upon the patients/consumers and the relationships between them and the nurses and midwives. “*More emphasis on therapeutic relationships with consumers, power sharing etc.*” and “*overall I think it is a strong framework. My primary concern is that it significantly downplays the role of patients in the digital health ecosystem - a role which is increasing.*” Some respondents expressed concern that it would be difficult to implement the Framework without a specific assistance “*My only concern would be it would not be utilised to its full potential, without the drive from key informatic nursing and midwifery players it could end up on the shelf.*”

3. Discussion

Essentially, the feedback from the consultation was positive and where required actionable suggestions for change have been provided by respondents. The final version of the Framework [4] incorporated as much of the feedback from the broad consultation as was possible. Suggestions in relation to the language used resulted in changes to the Framework to become more patient/consumer-centric in its language. The most significant change was to the order of the domains as respondents identified that the initial Framework prioritised the Technology domain too heavily. The final order of the domains is: Domain 1: Digital Professionalism, Domain 2: Leadership and Advocacy, Domain 3: Data and Information Quality, Domain 4: Information-enabled Care, and Domain 5: Technology. Requests for supplementary resources and case studies resulted in the development of supporting resources that demonstrate the way the Framework can be used by individuals and organisations [21]. The Framework was delivered to the Agency in June 2020 and launched by the Minister for Health in October 2020 after endorsement by the Jurisdictional Advisory Committee and Board.

4. Conclusion

Having employed an inclusive, consultative and comprehensive methodology to develop a capability framework the major nursing and midwifery organisations in Australia have endorsed the National Nursing and Midwifery Digital Health Framework for use. The Agency has commissioned the AIDH to develop an implementation plan for the Framework. The Framework is now being reviewed for application and use by a number of countries leveraging off this Australian work.

References

- [1] Australian College of Nursing, Health Informatics Society of Australia, and Nursing Informatics Australia. Nursing Informatics position statement. 2017, HISA: Melbourne; Available from: https://www.hisa.org.au/wp-content/uploads/2017/08/Nursing-Informatics-Position-Statement_06082017.pdf
- [2] Australian Digital Health Agency. Australia's National digital health strategy - Safe, seamless and secure: Evolving health and care to meet the needs of modern Australia. 2016, Australian Government; Available from: https://conversation.digitalhealth.gov.au/sites/default/files/adha-strategy-doc-2ndaug_0_1.pdf
- [3] Australian Digital Health Agency. National Digital Health Workforce and Education Roadmap, Australian Digital Health Agency. Editor. 2020, Australian Government: Sydney, NSW; Available from: https://www.digitalhealth.gov.au/sites/default/files/2020-11/Workforce_and_Education-Roadmap.pdf.
- [4] Australian Digital Health Agency. The National Nursing and Midwifery Digital Health Capability Framework, Australian Digital Health Agency. Editor. 2020, Australian Government: Sydney, NSW; Available from: https://www.digitalhealth.gov.au/sites/default/files/2020-11/National_Nursing_and_Midwifery_Digital_Health_Capability_Framework_publication.pdf
- [5] Honey M, Collins E, Britnell S. Guidelines: Informatics for nurses entering practice. 2018, University of Auckland: Auckland, NZ.
- [6] Kinnunen U-M, Rajalahti E, Cummings E, Borycki EM. Curricula Challenges and informatics competencies for nurse educators. *Studies in Health Technology and Informatics*, 2017. 232: p. 41-48.
- [7] Murphy J, Goossen W, Weber P, eds. Forecasting Informatics competencies for nurses in the future of connected health. *Studies in Health Technology and Informatics*. Vol. 232. 2017, IOS Press: Netherlands.
- [8] Australian Nursing and Midwifery Accreditation Council, Midwife Accreditation Standards 2014, The Australian Nursing and Midwifery Accreditation Council: Canberra ACT; Available from: www.anmac.org.au/
- [9] Australian Nursing and Midwifery Accreditation Council (ANMAC), Australian Nursing and Midwifery Accreditation Council Registered Nurse Accreditation Standards. 2012; Available from: <http://www.anmac.org.au/accreditation-standards>
- [10] Cummings E, Shin E, Mather C, Hovenga E. Embedding nursing informatics education into an Australian undergraduate nursing degree. *Studies in Health Technology and Informatics*, 2016. 225: p. 329-333.
- [11] Sasso L, Bagnasco A, Watson R. Competence-sensitive outcomes. *Journal of Advanced Nursing*, 2016. 73(5): p. 1002-1003.
- [12] Shin E, Cummings E, Ford K. A qualitative study of new graduates' readiness to use nursing informatics in acute care settings: clinical nurse educators' perspectives. *Contemporary nurse*, 2017. 54(1): p. 64-76.
- [13] O'Connell J, Gardner G, Coyer F. Beyond competencies: using a capability framework in developing practice standards for advanced practice nursing. *Journal of Advanced Nursing*, 2014. 70(12): p. 2728-2735.
- [14] Nursing and Midwifery Board of Australia. Registered nurses standards for practice 2016. Nursing and Midwifery Board of Australia: Australia; Available from: <https://www.nursingmidwiferyboard.gov.au/Codes-Guidelines-Statements/Professional-standards/registered-nurse-standards-for-practice.aspx>
- [15] Nursing and Midwifery Board of Australia. Midwife standards for practice 2018. Nursing and Midwifery Board of Australia: Australia; Available from: <https://www.nursingmidwiferyboard.gov.au/Codes-Guidelines-Statements/Professional-standards/Midwife-standards-for-practice.aspx>.
- [16] National Health Service (NHS). A Health and care digital capability framework building a digital ready workforce programme and health education England's technology enhanced learning programme. Editor. 2017: UK; Available from: <https://www.rcn.org.uk/-/media/royal-college-of-nursing/documents/clinical-topics/a-health-and-care-digital-capabilities-framework.pdf?la=en&hash=52C50756A9B0EF5F09A83EDB33EC286A62579847>
- [17] Nursing and Midwifery Board of Australia. Enrolled Nurse standards for practice 2016. Nursing and Midwifery Board of Australia: Australia.
- [18] Brunner M, McGregor D, Keep M et al. An eHealth Capabilities framework for graduates and health professionals: Mixed-Methods study. *J Med Internet Res*, 2018. 20(5): p. e10229.

- [19] Australian Primary Health Care Nurses Association (APNA). APNA Career and education framework for nurses in primary health care – registered nurses. 2018, Australian Primary Health Care Nurses Association (APNA),: Melbourne; Available from: <https://www.apna.asn.au/files/APNA%20Career%20and%20Education%20Framework%20for%20Nurses%20in%20Primary%20Health%20Care%20-%20Registered%20Nurses.pdf>
- [20] Australian Digital Health Agency. Clinical reference leads. 2021 [cited 2021 27 April]; Available from: <https://www.digitalhealth.gov.au/about-us/clinical-reference-leads>
- [21] Woods L, Cummings E, Dobroff N et al. Intended Use of the national nursing and midwifery digital health capability framework. *Studies in Health Technology and Informatics*, 2021. 276: p. 106-111.