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Implementing a National Nursing and Midwifery Digital Health Capability Framework: Exploring Knowledge, Experience in Informatics and Barriers and Enablers

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Abstract. A National Nursing and Midwifery Digital Health Capability Framework was developed in 2020 to define and complement digital health knowledge and skills for professional practice. This mixed-methods study explored nurses' and midwives' Framework knowledge and its applicability, types and extent of nursing and midwifery informatics roles, and barriers and enablers to working in informatics. Survey respondents reported familiarity with the Framework, with content analysis identifying three themes - informatics as part of nursing or midwifery roles, descriptions and variability of informatics roles, and the need for informatics role development and recognition. Framework knowledge can be improved through standardised and defined roles and a career pathway that includes national, organisational, local, and individual support.

Keywords. adoption and use of digital health standards, change management, digital health, standards

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1. Introduction

The National Nursing and Midwifery Digital Health Capability Framework (NNMDHCF) was funded and published in 2020 by the Australian Digital Health Agency. The Australasian Institute of Digital Health consulted with key nursing and midwifery professional bodies (who formed an advisory group) to ensure content aligned with professional requirements. It was developed to define digital health knowledge, skills and attitudes for professional practice; complement existing knowledge, skills, and attitudes; and provide a basis for learning. It recognised the importance of every nurse and midwife having "the skills to use data, information, knowledge and technology to maximise health and societal outcomes, improve services, and extend their evidence-based practice" [1]. Despite its introduction over three years ago, little is known about how the NNMDHCF has been embedded throughout Australian healthcare systems, including the types and extent of Australian nursing and midwifery informatics roles.

To address these knowledge gaps, this study aimed to i) understand nurses' and midwives' knowledge about the NNMDHCF and its applicability, ii) explore what informatics roles exist for Australian nurses and midwives, and iii) identify barriers and enablers to Australian nurses and midwives working in informatics.

2. Methods

A mixed-methods design, comprising a survey and focus groups (FGs), was chosen as it enabled the research team to substantiate and clarify results from different data sources, explore new perspectives, and integrate data breadth and range [2]. All Australian nurses and midwives were eligible to participate in this study.

2.1. Survey

The survey questions were developed by the research [3]. Survey questions explored respondents' knowledge of, and familiarity with, the NNMDHCF domains, their work experience, roles, responsibilities, training, reporting lines and what barriers and/or enablers they have experienced whilst working in informatics. The survey invitation was disseminated broadly by the Australian College of Nursing. The survey was hosted on the Australian College of Nursing's Qualtrics account to support data collection and data storage in accordance with research requirements. Completion of the online survey indicated implied consent. Quantitative data analysis included descriptive and frequency statistics. At the end of the survey, respondents were invited to provide their email addresses as an expression of interest to participate in an online FG. These email addresses were separated from the remainder of the survey results.

2.2. Free-text Comments and Focus Groups

The research team developed open-ended FG questions. Questions focused on familiarity with the NNMDHCF, informatics career or experience, perceptions on barriers and enablers to working in informatics and digital health, and what skills would be necessary for success in this area. The nurse or midwife indicated implied consent to receive a separate email invitation to participate in a FG by providing their email address at the

end of the survey. FGs were held online via videoconferencing at a mutually agreeable time. Verbal consent was obtained at the start of every FG, and FGs were recorded to facilitate data analysis (only the audio component was stored, and the video component was deleted). Transcriptions and field notes taken during the FGs and free-text comments were then analysed using content analysis (undertaken by two research team members).

2.3. Ethics Approval and Considerations

This study was accepted by the Australian College of Nursing's Human Research Ethics Committee (Low Risk). There were no foreseeable risks due to the voluntary nature of the study. All data was de-identified, and confidentiality maintained. The Strengthening the Reporting of Observational Studies in Epidemiology checklist for cross-sectional studies was used to guide the study write-up [4].

3. Results

3.1. Survey Findings

A total of 238 nurses and midwives completed the survey throughout May 2023, however only 151 responses were analysed. Eighty-seven discarded responses were due to incomplete responses (>10% incomplete [5]). The survey had participants from every Australian state and territory, with five participants working in multiple states and/or territories (3.3%). An overall response rate of 0.03% was calculated using the number of nationally registered nurses and midwives from the Australian Health Practitioner Regulation Agency's 2021/2022 data [6]. The majority of survey respondents were female (n=117, 77.5%), aged 50-59 years (n=52, 35.1%), working in a metropolitan area (n=118, 78.1%), and in a public hospital (n=101, 67.3%). Most respondents were registered nurses (n=125, 83.3%), with many possessing a postgraduate qualification (n=116, 76.8%). Over 15% (n=23) have been a nurse or midwife for 26-30 years.

3.1.1. Knowledge of NNMDHCF

Eighty-four survey respondents described themselves as very familiar (n=43, 29.1%) or somewhat familiar (n=41, 27.7%) with the NNMDHCF. A quarter of respondents had heard of the domains but were unfamiliar with them (n=37), whilst another 27 were unfamiliar with the domains (18.2%). Most participants rated themselves as proficient for Domains 1 (Digital Professionalism, n=45, 54.9%), 2 (Leadership and Advocacy, n=45, 55.6%), 4 (Information Enabled Care, n=35, 43.2%) and 5 (Technology, n=37, 45.1%). For Domain 3, most respondents assessed themselves as intermediate (Data and Information Quality, n=38, 46.3%).

3.1.2. Informatics and Digital Health Work Experience, Role and Responsibilities

Most respondents were working in a nursing or midwifery informatics role (n=59, 39.1%), in ongoing roles (not just contracted or project work) (n=107, 73.3%), and had been working in informatics for 0-5 years (n=88, 63.3%). Almost 83% of respondents received on-the-job training for their informatics work (n=120), and half reported receiving organisational support for informatics training or qualifications (n=75, 50%).

Collaborating with colleagues (n=124, 84.9%) and attending conferences or webinars (n=110, 75.3%) were the most commonly used methods to keep up with advances in informatics. The respondents' work included a range of informatics roles and responsibilities with different technologies, different reporting lines, and a number of direct reports and pay awards. About half of respondents reported that their workplace held a senior nursing or midwifery informatics executive role and/or Chief Nursing and Midwifery Informatics Officer (n=80, 58%). Despite this, only 54.7% of respondents were paid under a nursing and midwifery award (n=81).

3.1.3. Barriers and Enablers to Nurses and Midwives Working in Informatics

Respondents identified a range of organisational barriers and enablers to working in informatics (Table 1). The highest rated barriers to advancing an informatics career were: lack of roles (n=93, 64.6%); lack of training or professional development opportunities (n=85, 59%); lack of organisational structure (n=66, 45.8%); and lack of organisational culture or leadership (n=64, 44.4%). The most commonly identified enablers for nurses and midwives working in informatics were technological support in their role(s) (n=76, 59.8%); undertaking training and education (n=74, 58.3%); organisational support (e.g. strategic planning) (n=68, 53.5%); and experiencing collegial/peer support and modelling (n=65, 51.2%).

3.2. Free-text Comments and Focus Group Findings

Seventy-five nurses and midwives indicated interest in FG participation. Despite flexibility with dates and times, 10 FGs were held online with 19 participants throughout June 2023. FGs ranged from 28-52 minutes in duration. There were 45 free-text comments added at the end of the survey by participants. Data were grouped into three categories using content analysis: i) Informatics as part of nursing or midwifery roles; ii) Descriptions and variability of informatics roles; and iii) Need for informatics role development and recognition. These qualitative findings corresponded to the quantitative data findings.

3.2.1. Informatics as Part of Nursing or Midwifery Roles

With the implementation of multiple digital health technologies within workplaces, some participants indicated they use digital health technologies in their work: *Informatics is a key element of my role rather than the sole purpose* (survey respondent 17). The findings also suggest there are some nurses and midwives who incorporate informatics work within other titled jobs or roles, however their colleagues may not fully appreciate the impact of informatics on their daily practice: *Nurses and clinicians, the challenge for us is actually getting them excited about informatics just broadly because a lot of them don't understand it, but they also don't understand that they're doing it now* (FG 9 participant 1). The knowledge of, and need for, specialty informatics nurses and midwives was undervalued by study participants: *Informatics though is our future, is not being encouraged, supported and invested in enough* (survey respondent 10). Nurses and midwives working in informatics are seen as clinical experts who are using their knowledge and experience to support digital health technologies' implementation and use: *You want clinicians who've got experience working clinically…need to understand…how hospitals work and the pressures and all the workflows of the different…units and disciplines* (FG 1 participant 1).

Table 1. *Identified barriers and enablers to nurses and midwives working in informatics.*

	Concept	n	%
Barriers encountered in advancing nursing and midwifery informatics career (multi-select)	Recognition	10	6.9
	EBA	2	1.4
	Contract/Project	4	2.8
	Funding	1	0.7
	Limitations regarding roles or responsibilities	11	7.6
	Lack of organisational structure	66	45.8
	Lack of organisational culture or leadership	64	44.4
	Lack of executive support/collaboration	56	38.9
	Lack of multi-disciplinary collaboration	31	21.5
	Lack of change management	37	25.7
	Lack of training or professional development opportunities	85	59.0
	Lack of nursing or midwifery informatics roles	93	64.6
	Too much competition for nursing or midwifery informatics roles	8	5.6
	None	11	7.6
	Missing	7	
How does your organisation support the work of nursing or midwifery informatics professionals? (multi-select)	Training and education	74	58.3
	Organisational support (strategic plan)	68	53.5
	Technological support (IT support and personnel for ease of use and troubleshooting)	76	59.8
	Environmental restructuring (modification of technology based on user acceptance and need)	30	23.6
	Collegial/peer support and modelling (super users or champions)	65	51.2
	Incentivisation	5	3.9
	Legal, ethical and clinical requirements	0	0.0
	Personal interest/motivation (e.g. can include mentoring)	53	41.7
	Career structure/prospects	31	24.4
	Missing	24	

3.2.2. Descriptions and Variability of Informatics Roles

There is a lack of standardised informatics roles across Australia for nurses and midwives. Participants described their varied roles and purposes across informatics functions and how their roles extend to informing their organisations and/or teams about nursing and midwifery informatics: *The conduit between frontline and IT teams to develop digital solutions* (survey respondent 20); *Highlighting…the information around what informatics is about and how it can relate to the workforce and the benefits to the workforce…Raising that sort of…awareness of what the position brings to the organisation and to the clinicians* (FG 10 participant 3). There is significant variability in roles, responsibilities, reporting lines, pay awards and leadership support between healthcare organisations, states, and territories: *I would like to see these roles standardised across the state…role and responsibilities can vary greatly* (survey respondent 36); *Informatics role in various organisations differ* (survey respondent 236).

3.2.3. Need for Informatics Role Development and Recognition

There is a need for professional and organisational recognition of informatics as a specialty. Nurses and midwives also identified the need for support and development opportunities accompanying a nurse specialty: There is little investment in the role of the nursing informaticist, with no career structure…*It needs more development ... a career pathway such as those for management, education, research and clinical* (survey respondent 103); *There's no kind of clear role descriptions or postgraduate qualification pathway or…recognition* (FG 10 participant 2).

4. Discussion

Study findings demonstrate that nurses and midwives currently working in informatics are aware of and have some working knowledge of the NNMDHCF. The Framework, if embedded, would assist with clarifying digital health requirements within the nursing and midwifery professions. The operationalisation of the NNMDHCF has not been successful to date and, therefore, has not resulted in any clarity on the value of informatics roles in contemporary Australian healthcare settings. Informatics will continue to grow and be critical to the provision of Australian healthcare. Many study participants described a general lack of support and awareness of the value of informatics roles, which could be supported by the NNMDHCF implementation and by enhancing nurses' and midwives' digital health capability. A lack of consistency in informatics roles could be addressed by applying the NNMDHCF to role descriptions and supporting workforce development.

5. Conclusions

Nurses' and midwives' knowledge about the NNMDHCF should be improved, however its applicability to support their work is inconsistent and differs due to variability in responsibilities, roles and knowledge. The NNMDHCF should be embedded and operationalised to ensure nurses' and midwives' informatics roles are defined, standardised, and supported.

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