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DISCUSSION

Using data from mHealth apps to inform person-centred practice: A discussion paper

Emma Radbron a,*, Tanya McCance b, Rebekkah Middleton a and Valerie Wilson a,c

aSchool of Nursing, Faculty of Science, Medicine and Health, University of Wollongong, Wollongong, Australia; bInstitute of Nursing and Health Research, Ulster University, Belfast, UK; cSouth Western Sydney Local Health District (SWSLHD), Ingham Institute for Applied Medical Research, Liverpool, Australia

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Background: mHealth applications (apps) are tools that can enhance research by efficiently collecting and storing large amounts of data. However, data collection alone does not lead to change. Innovation and practice change occur through utilisation of evidence. The volume of data collected raises questions regarding utilisation of data by nurses and midwives, and how data from mHealth apps can be used to improve person-centred practice. There is limited empirical evidence and a lack of direction from global health authorities to guide nurses and midwives in this area.

Aim: To describe strategies for nurses and midwives that could enhance the effective use of data generated by mHealth apps to inform person-centred practice. The purpose of this paper is to stimulate reflection and generate actions for data utilisation when using mHealth apps in nursing research and practice.

Methods: This discussion paper has been informed by current evidence, the integrated-Promoting Action on Research Implementation in Health Services (i-PARIHS) framework, and research experience as part of doctoral study.

Findings: Before engaging in data collection using mHealth apps, nurses and midwives would benefit from considering the nature of the evidence collected, available technological infrastructure, and staff skill levels. When collecting data and interpreting results, use of a team approach supported by engaged leadership and external facilitation is invaluable. This provides support to operate apps, and more importantly use the data collected to inform person-centred practice.

Conclusions: This paper addresses the limited available evidence to guide nurses and midwives when using mHealth apps to collect and use data to inform practice change. It highlights the need for appropriate technology, external facilitative support, engaged leadership, and a team approach to collect meaningful evidence using mHealth apps. Clinicians, leaders, and researchers can apply the strategies provided to enhance the use of mHealth apps and ensure translation of evidence into practice.

Keywords: data collection; digital technology; knowledge translation; mhealth; midwifery; nursing; nursing research; person-centredness; research utilization
Impact statement
This paper provides robust discussion and practical strategies regarding use of data collected with mHealth apps by nurses and midwives. Strategies include ensuring appropriate technology, external support, engaged leadership, a team approach, and the importance of collecting meaningful evidence.

Plain language summary
There is a lot of research reporting that mobile health (mHealth) apps are helpful tools to collect large amounts of data about patients and their experience in healthcare. This data can be meaningful and help improve healthcare for patients and staff. However, there is limited information describing what nurses and midwives do with the data that is collected from mHealth apps. There is also very little guidance for nurses, midwives, and researchers on the best approaches to take to help ensure the data is used. This paper was written to draw attention to the importance of nurses and midwives not only collecting data using mHealth apps but using the data to improve healthcare. It provides evidence-based strategies that can be used to help increase the chance of data being used to develop practice in a way that benefits all people (patients and staff). The strategies include making sure that teams have access to the right technology (devices and internet) and have support from leaders and people outside of their workplace who can help them collect the data and understand it. It also highlights how important it is for nurses and midwives to work together as a team and collect data that is meaningful to them and their patients.

Introduction
One of the World Health Organisation’s (WHO) Global Strategic Directions for Nursing and Midwifery 2021–2025 states ‘Nurses and midwives are to be supported, respected, protected, motivated, and equipped to safely and optimally contribute in their service delivery settings’ (WHO, 2021a, p.v). Nurses and midwives can contribute to service delivery in their workplace through involvement in research and quality improvement, using evidence (data) to transform care (research utilisation). However, they are often poorly equipped to evaluate and develop practice in this way (Alexander et al., 2022).

There are many benefits of research utilisation for nursing practice, including cost reduction, evidence-based policy development, enhanced workflow, improved patient outcomes, reduction in adverse events, increased patient satisfaction, strengthened nursing practice, feelings of empowerment, increased job satisfaction and enhanced perceptions of person-centredness (Alexander et al., 2022; Aljezawi et al., 2019; Berthelsen & Koreska, 2021; Morrison et al., 2022; Radbron et al., 2022). However, the literature disproportionately reports challenges for nursing staff engaging in research to evaluate and develop care. These challenges are frequently attributed to time, resources, lack of understanding, lack of management support, organisational culture, processes, and lack of authority to change practice (Alexander et al., 2022; Aljezawi et al., 2019; Berthelsen & Koreska, 2021; Morrison et al., 2022).

Background
The use of computer-based applications and mobile health (mHealth) applications (apps) on portable devices has become a popular solution to improve engagement in healthcare research. This popularity of apps is attributed to their ability to enhance data collection, allowing improved efficiency, smoother consent processes, remote access, reduction of costs, and increased access to
data in real-time (Booth et al., 2021; Radbron et al., 2019). Such technology has also demonstrated capacity to aid nursing research by collecting and storing larger volumes of data than were traditionally only possible with paper-based approaches (Im & Chee, 2019). This enhanced ability to collect, store, and access data provides greater opportunities for nursing and midwifery teams to evaluate and develop practice through research utilisation (Gawthorne et al., 2021).

The recognised benefits of mHealth technology have resulted in the development and availability of a plethora of apps. Such proliferation and ubiquity create potential misconceptions that apps are stand-alone solutions leading to change. However, while mHealth apps can be used to collect data that informs practice change, they are not ends in themselves; they are merely tools to assist the research process (WHO, 2019). Consequently, there has been an unbalanced focus on successful app usage as the outcome of research, rather than evidence reporting how data was utilised (Radbron et al., 2019). This results in a lack of guidance for nursing teams, leaders, and researchers when using mHealth apps to collect data that can be used to evaluate and improve person-centred practice. The focus on app testing also reduces the likelihood that data collected from these apps will be used at all, which is a considerable ethical issue. This discussion paper seeks to highlight the need for a shift in focus regarding the use of mHealth apps in nursing and midwifery research. It hopes to redirect the attention of the global nursing/midwifery community from simply testing mHealth apps, and refocus on conditions that enable use of the data collected by these tools. This is where the real potential for change lies!

As there are many definitions relating to person-centred practice, it is important to define person-centredness within the context of this discussion. McCormack and McCance (2017) define person-centredness as an approach to practice established through the formation and fostering of healthful relationships between all care providers, service users and others significant to them in their lives. It is underpinned by values of respect for persons (personhood), individual right to self-determination, mutual respect and understanding. It is enabled by cultures of empowerment that foster continuous approaches to Practice Development’ (McCormack & McCance, 2017, p. 3).

This well-recognised, holistic definition includes all persons involved in healthcare delivery and emphasises the value of collaboration and understanding. It also acknowledges the importance of empowering cultures that actively evaluate and develop practice. A process which can be enhanced by collecting and using data from mHealth apps.

**Methods**

The discussion and strategies presented in this paper have been informed by current literature, knowledge translation theory and recent research experience as part of a doctoral study. This study explored how nurses and midwives on six units, across three hospitals, generated and engaged with evidence from a mHealth app to inform person-centred practice change (Radbron et al., 2021; Radbron et al., 2022).

To ensure this discussion and subsequent strategies are anchored by theory and evidence, the well-recognised, integrated-Promoting Action on Research Implementation in Health Services (i-PARIHS) framework (Harvey & Kitson, 2016) has been used to inform the content and structure of this paper. The i-PARIHS framework is a theoretically informed and empirically tested conceptual framework, developed to guide and explain the successful utilisation of evidence in healthcare practice. It is summarised as an equation \( SI = \text{Fac}^n (I + R + C) \) where successful implementation (SI) occurs as a result of four key constructs of facilitation (Fac\(^n\)), innovation (I), recipients (R) and context (C). It is important to note facilitation has been positioned outside of the brackets. This is due to recognition of it as the active agent and driving force...
that enables successful implementation of research into practice through ‘assessing, aligning, and integrating’ the innovation, recipients, and context (Harvey & Kitson, 2016, p. 2). As such, this paper discusses evidence relating to the three constructs in the brackets before addressing the pivotal role (and benefits) of facilitation when using mHealth apps (see Figure 1). While the content of this discussion is directed at both nurses and midwives, to enhance readability, the term nursing will be used throughout the remainder of the paper.

Findings

**The importance of meaningful evidence and appropriate technology**

The first construct within the brackets of the i-PARIHS framework is *innovation*. This relates to the characteristics of knowledge, and the mechanisms used to generate it. In the case of mHealth apps, we argue that consideration of *innovation* should not begin with the technology. It begins with reflection on the data to be collected, and the existing available evidence. Harvey and Kitson (2016) outline that the nature of the evidence collected has a direct correlation with the success or failure of research utilisation in practice. Positive examples of this can be seen in the studies reported by Lynch and McCance (2022), Radbron et al. (2021) and Radbron et al. (2022). These studies used the same mobile app which collected data measuring eight person-centred nursing key performance indicators (KPIs). In these studies, (and others using the same KPIs), staff identified that the nature of the data collected was novel and meaningful. This had significant influence on its usability to inform practice change. It was deemed valuable because it related specifically to nursing practice, the patient experience, and was person-centred in its orientation (McCance et al., 2020; Wilson et al., 2021). As such, the authors encourage teams to consider the value of the data to be collected. Is it measuring what really matters to the persons it is concerning? Or is it just another tick-box research exercise? Will this data be collected and stored, or used to drive changes in practice?

When reflecting on the data to be collected, consideration should also be given to ethical principles such as respect for human beings, research merit and integrity, justice, and beneficence. This can be achieved by ensuring the aims of research or quality improvement align to the data being collected; that there is clear delineation between using healthcare data to guide care delivery and data that is used to answer research questions; and that consideration is

![Figure 1. Summary of strategies for using data collected with mHealth apps mapped to the i-PARIHS framework.](image-url)
given in relation to dissemination of findings. If there is intention to share the data and subsequent innovations in professional forums such as journal publications, then this should be made available to the public, and formal ethics approval obtained (Greenhalgh et al., 2019; National Health and Medical Research Council, 2023).

The next part of the process is choosing a suitable mHealth app. With over 300 000 health-related apps available in the Apple App and Google Play stores alone (Aungst et al., 2022), it is challenging for nurses to identify apps that are fit for purpose. There are also significant concerns regarding the quality, safety, and privacy of data storage (Llorens-Vernet & Miró, 2020). While there are large amounts of reviews using app stores and commercial databases, there are insufficient systematic reviews and practice guidelines providing quality evidence regarding app selection for clinicians. There are also very few mHealth apps developed by/for nurses with the intention of collecting data to influence person-centred practice change (Radbron et al., 2019). These growing concerns, limited availability of empirical evidence, and scarcity of apps designed to evaluate nursing practice, make it extremely difficult to determine which app is most appropriate to use (Ferguson & Jackson, 2017). It is therefore imperative that nursing leaders and teams are supported to select the safest and most effective apps. It also highlights the need for further research in this area.

Usability is another fundamental aspect to consider when selecting a mHealth app. This includes identifying apps that have been tested and deemed usable by nursing staff of all ages, as hesitancy towards app use in nursing has been demonstrated to increase with age (Pei-Ying et al., 2021). Attention must also be given to available technological infrastructure, as access to mobile devices and internet/wi-fi is frequently reported as an area that is poorly resourced within nursing (Booth et al., 2021). As such, it is essential that before committing to use mHealth apps (not after or during), that teams ensure they have adequate access to appropriate resources to support both the use of the apps, and the nurses expected to use them (Konttila et al., 2019; WHO, 2021b).

**The need for a team approach**

The second construct is recipients. It includes those that influence and are affected by the implementation of the innovation on an individual and team level. It also considers the characteristics of recipients such as motivation, skills and knowledge, collaboration and teamwork, time, resources, and support (Harvey & Kitson, 2016). Successful use of technology by healthcare professionals requires both willingness and competence. A recent systematic review looking at factors influencing research activity among nurses in clinical practice, reported that globally nurses are motivated to engage in nursing research (Morrison et al., 2022). However, attitudes and previous experiences influence the openness and motivation of healthcare professionals when using technology (Konttila et al., 2019). As such, it is important to ascertain interest, skill level and previous experience before engaging in research using mHealth apps.

Konttila et al. (2019) outline that collegial support is also key in ensuring positive experiences when using digital technology in healthcare. Similarly, this was the case in the study reported by Radbron et al. (2022). This involved having a range of staff from different delegations as part of the team driving the research. It also included regular written and verbal communication with the broader nursing team. For some units in this study clerical staff and students were also involved in the data collection process. These findings highlight that while in most cases mobile devices are often operated by a single user, the process of collecting and reflecting on data should be done as a team.

The authors recognise that collaborative, inclusive, and participatory approaches in research can be time consuming (Manley et al., 2021). However, we implore nursing leaders to resist the
temptation to take short cuts, carrying out research using mHealth apps individually, or worse, implementing change without involvement of the broader team. These transactional approaches do not lead to sustainable change, rather they result in communication breakdown and mistrust (Manley & Jackson, 2020). This behaviour also reinforces the belief of staff that despite engagement in research, “nothing changes” (Radbron et al., 2021, p. 5). While it requires more effort to ensure that nursing research is undertaken collaboratively, having a team approach holds long-term benefits for individuals, teams, and outcomes. Examples of this include enhanced experiences and effective workplace culture which increases the likelihood of research utilisation and implementation of sustainable practice change (Cardiff et al., 2020).

The value of engaged leadership

The third construct is context. This to be considered in relation to inner context (immediate setting and organisation) and outer context (wider health system, policies, frameworks, and political environment that govern the functioning of health systems). Some of the key characteristics of context include leadership support (formal and informal), local and organisational culture, structures, and systems (Harvey & Kitson, 2016). Nursing leaders at all levels of care have a significant influence on the implementation of research findings into practice through the creation of cultures that support innovation and change (Berthelsen & Koreska, 2021; Kitson et al., 2021). Alomari et al. (2020) outline that nurses are more inclined to engage with research and innovations and are more satisfied with their duties when empowered by leaders. However, empowerment is not simply achieved through rhetoric; actions carry greater weight, as the saying goes. As a practice-based profession, it is imperative for leaders to not only verbalise commitment to nursing research and knowledge translation but demonstrate this with their actions (Alexander et al., 2022; Aljezawi et al., 2019).

In our recent research experience using mHealth apps with nursing teams, we have found the following actions advantageous for nursing leaders when engaging in research to develop person-centred practice. Authentic engagement in the research process; the provision of protected time for staff to participate in data collection and analysis; regular communication, and the establishment of facilitative support. These actions are not only in relation to collecting data using apps but relate to use of the data itself. These approaches assist teams to collectively engage in the research process, maintain momentum, reflect on the data, and discuss and implement actions in response to the results. Conversely, when leaders fail to provide time, support, and communication to staff, momentum for research slows (Radbron et al., 2021; Radbron et al., 2022).

Similar approaches have been highlighted by Cardiff et al. (2020), and Manley and Jackson (2020). Their international research outlines the value of collective and person-centred leadership, collaborative, inclusive and participatory approaches to research and practice, and role modelling, where leaders “do what they say they will do” (Cardiff et al., 2020, p. 8). They emphasise that these attributes, values, and actions are vital in both the inner (unit and organisation) and outer (policy, organisational leadership, and governance) context. These findings are also complimentary to the strategy of a team approach outlined in the previous section and have a demonstrated positive influence not only on nursing research, but the development of effective workplace cultures (Manley & Jackson, 2020).

With the ever-increasing demands on clinical workloads and staffing shortages, it is becoming more and more challenging for nursing leaders to provide the time and support their teams need to engage in nursing research. This strain on organisations and leadership highlights a need for strategies that differ from the traditional approach of seeking hierarchical assistance. Instead, we suggest individuals, leaders and teams look to their peers and other connections to establish
collaborative and facilitative support external to themselves and their units. This leads to the need for, and benefits of facilitation.

**Technology might be helpful, but facilitation is essential**

Although this discussion paper has highlighted the lack of evidence regarding mHealth apps and data usage, what is well established in current literature regarding such innovations is the need for intentional support for nursing staff to collect data and use it to transform practice (Kitson & Harvey, 2016; Lynch & McCance, 2022; McCance et al., 2020). With its key purpose being lasting transformative change (Ågotnes et al., 2021), facilitation has been increasingly recognised as an effective approach to support healthcare teams in the evaluation and development of care delivery across a wide range of settings (Cardiff et al., 2020; Manley et al., 2021). Facilitation has a demonstrated positive influence in supporting the process of nursing research and the implementation of evidence into practice. This approach focuses on the co-production of knowledge ‘with’ others, through critical reflection and dialogue. It has a key function in creating opportunities to learn in and about practice that results in individual and organisational change (Kitson & Harvey, 2016; Middleton et al., 2021). This makes it a well-suited approach when engaging in nursing research using mHealth apps to collect data, as it provides the opportunity for staff to be supported in developing skills to operate apps but more importantly, enables discussion and utilisation of the data collected.

Another benefit of facilitation compared to education-based approaches to research and quality improvement is that it has a goal of autonomy rather than learner dependency (Ågotnes et al., 2021). While education-based approaches are beneficial in increasing knowledge about the conduct of research, facilitation results in transformation of individuals and teams through the co-production of knowledge and development of research skills in practice (Middleton et al., 2021). These skills can then be shared with others and used to engage in repeated studies or other research projects using mHealth apps.

Facilitation can be provided effectively by individuals internal or external to the unit or organisation (Duff, 2020) with challenges and benefits to both approaches. However, based on our research experience, we argue that external facilitation is the most effective, non-technological strategy to support teams to use data collected from mHealth apps to improve practice (Radbron et al., 2022). While both internal and external facilitative approaches can enable development of practical skills in the use of mHealth apps, having someone external to the setting can enhance reflection and collaboration. This is because external facilitation can provide a neutral environment for staff to evaluate the collected data and speak freely.

Recent examples of studies that identified the value of external facilitative support when engaging in nursing research using an mHealth app include McCance et al. (2020), Lynch and McCance (2022), and Radbron et al. (2022). As mentioned earlier, these studies all used the same mHealth app to evaluate and develop person-centred practice in a range of clinical specialties and community settings in Australia and Northern Ireland. All reported the significant value of external facilitation in assisting teams to use the app, navigate technical challenges, and then make sense of the data (innovation). In each of the studies, external facilitative support assisted leadership and clinical teams (recipients and context) to engage in the research and maintain momentum, which led to person-centred changes through use of the data. It is also important to note that external facilitation was used as part of a cyclical approach over a prolonged period and not as a one-off intervention.

While we strongly encourage the use of external facilitation, we also acknowledge that not all settings have access to expert levels of facilitative support. In these situations, leaders and teams would benefit from identifying existing expertise within the organisation on a micro, meso, and
macro level, and investing in facilitation development (Kitson & Harvey, 2016). Collaboration across interdisciplinary teams and academic institutions is also recommended.

**Conclusion**

In summary, while digital innovations like mHealth apps can be helpful, nursing and midwifery research does not need to become more technical. Using mHealth apps and the data they collect amplifies the need for person-centred strategies in the form of a team approach, engaged collective leadership, and external facilitation. These approaches combined with appropriate technological support to collect meaningful evidence is what results in successful use of mHealth apps, research utilisation, and person-centred practice change.

**Disclosure statement**

No potential conflict of interest was reported by the author(s).

**ORCID**

Emma Radbron  [http://orcid.org/0000-0002-8180-5550](http://orcid.org/0000-0002-8180-5550)

Tanya McCance  [http://orcid.org/0000-0002-9787-2627](http://orcid.org/0000-0002-9787-2627)

Rebekkah Middleton  [http://orcid.org/0000-0002-8440-7451](http://orcid.org/0000-0002-8440-7451)

Valerie Wilson  [http://orcid.org/0000-0001-7138-5591](http://orcid.org/0000-0001-7138-5591)

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