

LITERATURE REVIEW

Exploring the ways communication technology is used by midwives and pregnant women/people: An integrative review

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ABSTRACT

Background: Pregnant women/people globally are increasingly using digital technology such as texting, emailing, instant messaging, pregnancy applications, social media and the internet to access information about their pregnancy. There is little information, however, on how the technology is used to enable midwives and pregnant women/people to communicate with each other and what effect this may have on the quality of maternal and newborn health within Aotearoa New Zealand.

Aim: To explore the literature on how communication technology has been used to enable midwives and pregnant women/people to connect with each another.

Method: An integrative literature review of peer reviewed studies between 2010 and 2021 was undertaken to explore how communication technology was used to enable midwives and pregnant women/people to connect with each another. The initial search elicited 450 articles, of which five met the inclusion criteria. These were then assessed using the Critical Appraisals Skills Programme checklist.

Results: The five relevant studies were summarised using an evidence table to enable comparison of themes or relationships between the studies. Four main themes were identified: (1) connecting, (2) access to healthcare, (3) privacy and confidentiality, and (4) lack of skills and knowledge. Using communication technology appeared to provide a safe space for information sharing within which pregnant women/people and midwives could connect. A feeling of connection was important, in supporting the pregnant woman/person in their access to maternity services. This emotional connection was enabled regardless of whether the pregnant person and midwife were known to each other. However, concerns were identified relating to issues of privacy, and the skills pregnant women/people and midwives needed to access and use the technology.

Conclusion: Gaps in the published literature were highlighted through undertaking this integrative literature review. The first was in the understanding of how midwives and pregnant women/people use communication technology when communicating with one another, and the second was in how communication technology is used within a midwifery continuity of care model.

Keywords: communication technology, midwives, pregnant women

INTRODUCTION

Effective communication which is responsive to a person's needs and preferences has been identified by the World Health Organization (WHO) as being one of five key categories for improving quality of care during childbirth (Bohren et al., 2017; WHO, 2016). Communication practices that utilise digital technology such as short message service (SMS), emailing and instant messaging have been increasingly used over the last 30 years. (SMS is a system for sending text messages between mobile phones [Cambridge Dictionary, n.d.] and will be referred to as texting throughout this integrative review.) Interactions take the form of being either synchronous (occurring at the same time) or asynchronous (when

there is a delay in the sending and/or receiving of a message). Living in a "digital society" or being a "digital citizen" are terms used to describe ways in which people communicate with one another using digital technology (Zwimpfer et al., 2017). There are expectations that communication technology users are interacting, collaborating, sharing and connecting with others through online platforms or messaging services (Zwimpfer et al., 2017). These expectations are noted within Aotearoa New Zealand (Aotearoa NZ) where 91% of adults aged between 18-34 years own a smartphone (Research New Zealand, 2015) and, in 2018, 89% of Aotearoa NZ's population were active internet users (Hughes, 2019). This compares similarly to smartphone use

(Granwal, 2021; O’Dea, 2021) and internet use (Keats, 2021; Statista Research Department, 2021) by adults in Australia and the United Kingdom (UK) respectively. How communication technology is used by pregnant women/people and midwives is the focus of this integrative literature review.

BACKGROUND

Use of communication technology within maternity care

The use of communication technology within healthcare globally takes various forms, with literature referring to mobile health (mHealth), electronic health (eHealth), telehealth, mobile health applications and mobile technology as ways of informing about, or enabling access to, healthcare (Chib, 2010; Daly et al., 2018; Fazal et al., 2020; Labrique et al., 2013; Lupton & Maslen, 2017; Ministry of Health, 2020b; Speciale & Freytsis, 2013; van den Heuvel et al., 2018; White et al., 2019; Willcox et al., 2019). Email and text messaging between healthcare organisations and consumers of healthcare services enable efficient communication in the form of appointment reminders, the dissemination of results and educational information on ways to change or improve lifestyle behaviour (Dobson et al., 2017; Evans et al., 2012; Goldfarb et al., 2016; Leahy et al., 2017; Muller et al., 2016). With advances in technology, mobiles and smartphones have become more accessible to maternity consumers. Internet access has been enhanced, applications have improved in effectiveness and social media platforms have become more fit-for-purpose. This has enabled information about pregnancy, labour and birth or postnatal experiences to be more freely accessible than in previous times (Alianmoghaddam et al., 2019; Fleming et al., 2014; Gleeson et al., 2019; Lagan et al., 2010; Lupton, 2016; Lupton & Pederson, 2016; Tranter & McGraw, 2017; Tripp et al., 2014).

In remote or rural areas where access to healthcare services may be limited, the flexibility and availability of programmes reliant on mobile technologies such as mHealth or telehealth have improved maternal and child health outcomes through texting, voice messaging or video-calling health education and information to pregnant women/people and families (Chib, 2010; Evans et al., 2012; Fazal et al., 2020; Gelano et al., 2018; Labrique et al., 2013; LeFevre et al., 2017; Soltani et al., 2012; Speciale & Freytsis, 2013; Willcox et al., 2015; Willcox et al., 2019). Within Aotearoa NZ, the National Telehealth Service was established between the Ministry of Health (MOH) and Homecare Medical in 2015 to develop and integrate a national telehealth service which incorporated Ministry-funded health services and communication platforms for consumers (MOH, 2020b). This service enabled consumers to access virtually the healthcare service they needed via a range of communication channels.

Within the current global Covid-19 pandemic, use of digital technologies such as video-calling has in some instances replaced the physical face-to-face assessment normally undertaken by midwives. In 2020, when Aotearoa NZ was engaged in a Covid-19 elimination strategy, midwives were encouraged to hold virtual appointments unless a face-to-face appointment was strictly necessary and, where this was the case, to limit contact to no more than 15 minutes (MOH, 2020a; New Zealand College of Midwives, 2020).

Concerns with communication technology within maternity care

While access to technology has been shown to be beneficial, some mHealth technologies can be problematic, particularly if pregnant

women/people and midwives are living in areas with poor internet connectivity or mobile phone signal access, such as in rural or remote rural locations (White et al., 2019). Further barriers can also exist for pregnant women/people where there are financial constraints or literacy concerns which can make it difficult to access and interpret health information (Dalton et al., 2018; Fleming et al., 2014; McAra-Couper et al., 2020).

Concerns around unsafe care have been identified by midwives where they feel they are competing with mobile phones when trying to communicate or connect with women during labour or shortly after birth (Dahl et al., 2017; Lewis et al., 2019). Midwives have expressed concerns about delay of care where they perceived women were more focussed on their phone than on the midwife providing care, and where women were interrupting a conversation with their midwife to answer their phone (Dahl et al., 2017; Lewis et al., 2019).

Other concerns identified, which may have far graver consequences, relate to the asynchronous nature of texting or instant messaging, with uncertainty around whether messages had been received, and also the interpretation of messages (Häkkinen & Chatfield, 2005). Within Aotearoa NZ, communication practices where text messaging has been used between midwives and maternity consumers have led to complaints being made to the New Zealand Health and Disability Commissioner (HDC). These complaints led to midwives coming under criticism from coroners for using text messaging which was deemed to be inappropriate for completing a clinical assessment, for inappropriate use of text messaging from a midwife to a woman, for failing to document text messages within the clinical notes, and for situations where the midwife had failed to appropriately advise women about the use of text messaging for urgent matters (HDC, 2013a, 2013b, 2014a, 2014b, 2016). While many of these complaints were related to the use of text messaging, other concerns have been identified with security, privacy of messages and confidentiality of patient information held on devices that do not contain passwords or encryption (Basevi et al., 2014; Goldfarb et al., 2016; Leahy et al., 2017; Muller et al., 2016; Nettrour et al., 2019). This was highlighted in a recent cyber-attack on a district health board (DHB) in Aotearoa NZ, which resulted in the entire IT system and phone lines crashing (Otago Daily Times, 2021). Hackers were thought to have gained access to the DHB network through an employee unwittingly opening an email attachment (Cullen Law, 2021). The impact on patient services within the DHB were still being felt a month after the attack (Wilson, 2021). So, while the use of communication technology is widespread throughout the health system, evidence would suggest there is need for caution and, therefore, there is need for further exploration.

Rationale for integrative review

The ubiquitous use of communication technology within all facets of life has highlighted both the benefits and concerns around how such communication is used between maternity providers and consumers. There is little information, however, identifying how midwives and pregnant women/people use communication technology when communicating with each another. An integrative literature review involves reviewing, analysing and comparing studies on a specific topic that utilise a variety of research methodologies and is therefore useful when there is little known on a particular research topic (Snyder, 2019). This differs from a conventional literature review which tends to summarise relevant literature, or a systematic review which specifically includes experimental research studies, which could otherwise be quite limiting.

AIM

To explore the literature on how communication technology has been used to enable midwives and pregnant women to connect with one another.

METHOD

An integrative literature review of peer reviewed studies published between 2010 and 2021 was undertaken to explore how information and communication technology (ICT) was used to enable midwives and pregnant women to connect with each another. This approach allowed for the inclusion of both qualitative and quantitative methodologies (Russell, 2005; Whittemore & Knafl, 2005). Four databases commonly used within healthcare research – CINAHL, Pubmed, Proquest and the Australia NZ Reference Centre – were used to undertake searches using the following terms (communication technology OR ICT) AND (midwives OR midwife OR midwifery) AND (pregnant women OR pregnancy OR expectant mothers). A description of the review process has been captured using an adapted PRISMA flow chart (Figure 1). While a PRISMA flow chart is generally used when undertaking a systematic review, it is also helpful in providing a visual representation of the integrative literature review process.

Criteria for inclusion in the review

Included studies were those published between 2010 and 2021 which incorporated use of communication technology used during the antenatal period by pregnant women and/or midwives. The results were restricted to English language and peer reviewed publications.

Exclusion criteria

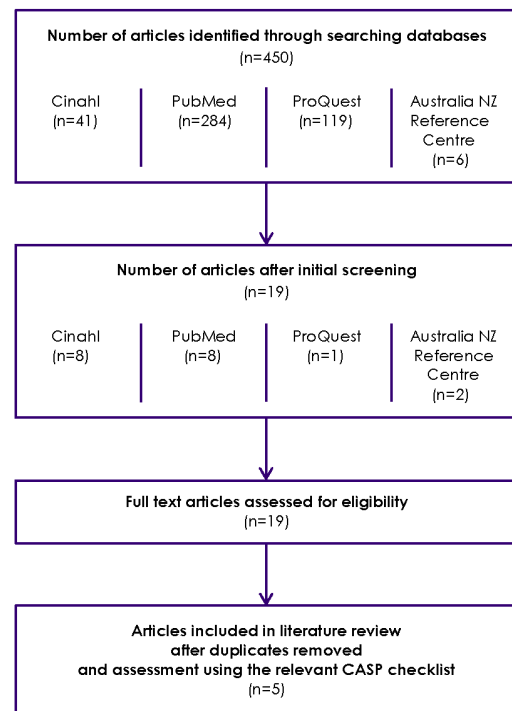
Excluded studies were those where the technology was used as an intervention to screen or diagnose a condition, rather than as a communication device, or where the communication included health professionals other than midwives.

The initial search elicited 450 articles. The title and abstract of each article were reviewed for their relevance. This resulted in the removal of 431, leaving 19 relevant articles. Four duplicates were removed and, after reading in full the remaining 15 articles, five studies were retrieved and assessed for relevance using a Critical Appraisals Skills Programme (CASP) checklist relevant to the appropriate study (CASP UK, n.d.). CASP checklists were developed and piloted originally as an educational pedagogical tool to be used when assessing a study's validity and therefore an appropriate tool to use for assessing the robustness of qualitative, mixed methods and quantitative studies incorporated in this integrative review (CASP UK, n.d.). All five studies satisfied the checklist requirements.

Analysis

Miles and Huberman (1994) describe a four-step process for analysing data when undertaking an integrative review: data reduction, data display, data comparison and conclusion drawing/verification. An annotated bibliography was compiled to determine which publications would be included in the review, and which would serve as background information (data reduction). Once the annotated bibliography had been compiled (data display), the studies were reviewed using the relevant CASP checklist to help appraise and critique the relevance of each study to the review question. The five relevant studies were then compared looking for patterns, themes, or relationships (data comparison). This was done through use of different coloured highlighter pens to identify the different themes between the various studies. An evidence table

Figure 1. Adapted PRISMA flow chart representing the literature review process



(Table 1) was then compiled to summarise the five studies. A final column was added to the evidence table and included the main themes identified from the review. These themes were discussed and agreed by the researchers.

FINDINGS

Five research papers met the inclusion criteria and are presented in Table 1. Included papers were summarised using an evidence table with the following headings: Author, Methods/Design, Sample, Aims, and Themes arising from results.

The studies summarised in Table 1 include two qualitative studies, two mixed methods designs and one quantitative design. The studies were undertaken in Australia (2), Aotearoa NZ (1), the United States of America (1) and the UK (1).

The final column highlights common themes relevant to how communication technology has been used between midwives and pregnant women. The four main themes identified were (1) connecting, (2) access to healthcare, (3) privacy and confidentiality, and (4) lack of skills and knowledge. The overarching theme identified across all studies was connection between pregnant women and midwives. The ability to connect using technology enabled pregnant women to access healthcare services; thereby, it has reduced barriers to healthcare (Gasteiger et al., 2019; McCarthy et al., 2017). The use of communication technology, however, was not always viewed positively when it related to issues of privacy or where there were concerns with having the skills to access and use the technology. Three out of the five studies reviewed identified these issues as concerns (Dalton et al., 2014; Gasteiger et al., 2019; Shroder et al., 2018).

Connecting

Connection was the overarching theme across all five studies. Four types of communication technology were described: texting, video calling, social media (or online discussion forums) and phone calls or use of mobile phones (Dalton et al., 2014; Forti et al., 2013; Gasteiger et al., 2019; McCarthy et al., 2017; Shroder et al., 2018).

Table 1. Summary of studies reviewed

Author	Methods/Design	Sample	Aim/s	Theme/s arising from results*
Dalton et al. (2014)	Mixed methods Semi-structured interviews (n=8) Two focus groups (n=4 & n=9) Self-selected survey (n=19)	Midwives providing antenatal information and education at a hospital in Australia	To investigate attitudes/ experiences of using information and communication technology (ICT) To identify potential factors that encourage/inhibit use in antenatal care	Lacking skills using and accessing technology Concern with privacy and confidentiality Lack of connection when unable to see the person
Forti et al. (2013)	Prospective cross-sectional design Survey (n=15)	Midwives from a group practice in a tertiary hospital in Australia	To explore which were the frequently used communication modalities between midwives and their clients	Connecting
Gasteiger et al. (2019)	Kaupapa Māori methodology** Semi-structured interviews (n=9)	7 women and 2 men from Northland, Aotearoa NZ	To explore perceptions, and use, of technologies by women and their partners who utilised Kaupapa Māori perinatal health services, which incorporate Māori philosophies and practices	Reduced barriers, promoting access to information Saving time and travel costs Connecting; face-to-face valued Lack of skills using technology Privacy concerns
McCarthy et al. (2017)	Qualitative longitudinal study using thematic analysis Focus groups (n=8; 4 online, 4 face-to-face) Individual interviews (n=28)	31 women and 4 midwives in 2 National Health Service trusts in the UK	To explore the experiences of pregnant women and their midwife moderators using an online Facebook group	Online platform gave some anonymity Enabled access to healthcare information Connection; women trusted the midwife, giving them confidence
Shroder et al. (2018)	Longitudinal mixed methods Surveys & interviews (n=109)	82 pregnant women and 27 caregivers, USA	To explore communication technology use by pregnant women and their caregivers/ partners	Connecting, seeing the person Convenience, saves time Privacy and security concerns

* Full results available from corresponding author. ** Kaupapa Māori methodology focuses on research undertaken by Māori with Māori to improve Māori wellbeing.

In three studies, texting was found to be easy to use and an efficient way for women to contact their midwife when changing appointments, requesting health information or to ask questions (Forti et al., 2013; Gasteiger et al., 2019; Shroder et al., 2018).

Video calling was beneficial for pregnant women when accessing a health professional. The video aspect enabled people’s reactions to be seen while also saving costs on travelling to a health provider when accessing the call from home (Shroder et al., 2018). Connecting women to a virtual midwife in an asynchronous online platform environment was beneficial as women felt more comfortable asking questions which they might not otherwise ask a busy midwife face-to-face (McCarthy et al., 2017). The women felt the Face-wives (midwife moderators) were more freely available to respond to questions and concerns in a timely manner. The Face-wives equally felt connected with the women and expressed satisfaction with this online relationship. This connection was developed through a relationship built on trust and confidence, especially around information sharing (McCarthy et al., 2017).

Access to healthcare

Three studies identified how use of communication technology increased access to healthcare information or contact with a maternity provider (Gasteiger et al., 2019; McCarthy et al., 2017; Shroder et al., 2018).

Access to healthcare was enabled in two ways for pregnant women living in a rural location in Aotearoa NZ (Gasteiger et al., 2019). Firstly, communication technology enabled access to online health information and connection with their midwife, thereby reducing costs for travel and wait times at a clinic for a face-to-face appointment. Secondly, communication technology (texting) enabled pregnant women to connect with their midwife in the “virtual space” to ask questions or share information they might not otherwise have done face-to-face or via a phone call. Pregnant women participating in an online Facebook group found this platform provided anonymity and confidence to ask and share information with a “virtual midwife” (McCarthy et al., 2017). The virtual midwife was able to respond to questions in a timely manner which met a need in cases where women were unable to access this information from their busy midwives in face-to-face interactions. In contrast to using an online discussion forum, Skype or Facetime enabled pregnant women to share physical symptoms with their healthcare providers. This was reportedly more convenient and avoided a physical face-to-face assessment (Shroder et al., 2018). The participants in this study commented on the preference for face-to-face online interaction to a phone call as facial expressions and reactions could be seen which provided a more personal connection.

While communication technology has been beneficial in enabling pregnant women/people to access and connect with a maternity care provider, there have also been concerns identified around its use. Two main concerns were identified from the studies in this review and will be reported under the themes: privacy and confidentiality; and skills and knowledge.

Privacy and confidentiality

Privacy and confidentiality were of concern for several of the participants in three of the studies (Dalton et al., 2014; Gasteiger et al., 2019; Shroder et al., 2018). Midwives were concerned about antenatal information provided in an online environment being taken out of context or potentially being misused due to not “seeing” who the information was being shared with (Dalton et al., 2014). Use of communication technology raised several concerns for midwives around their own privacy when their images were posted on social media (Dalton et al., 2014).

Gasteiger et al., (2019) reported women were concerned about advertising appearing on their Facebook site about pregnancy-related matters when they had used search engines to access health information related to pregnancy. This information was then visible to anyone accessing the woman’s Facebook site and was something the women had not realised would happen.

Skills and knowledge

Lack of skills and knowledge in using communication technology was identified by women and midwives in two of the studies reviewed (Dalton et al., 2014; Gasteiger et al., 2019). The concerns raised were around accessing the electronic patient portal system (Gasteiger et al., 2019) and concern with “where” the information was going in an online forum (Dalton et al., 2014). Dalton et al., (2014) found midwives were concerned about their own ability and skills with using the technology to communicate with women via social media or other online discussion forums where physical face-to-face interactions were not available. They felt uncomfortable responding to questions in an online platform as they were unsure who was accessing this information and whether this information could be taken out of context.

DISCUSSION AND IMPLICATIONS FOR FURTHER RESEARCH

The aim of this integrative review was to explore how communication technology has been used between midwives and pregnant women/people. The outstanding theme from the five studies reviewed related to the way communication technology enabled a connection to occur between the health professional and maternity consumer.

Being connected did not necessarily mean face-to-face. A feeling of connection was important, in supporting the pregnant woman/person in their access to maternity services. Colorafi (2016) discusses connection as “the energy that exists between people when they feel seen, heard, and valued; when they can give and receive without judgment; and when they derive sustenance and strength from the relationship” (p.2). While the midwives and pregnant women in the studies reviewed were not always “known” to each other, or could see each other, there appeared to be an “emotional connection” which was enabled through use of communication technology. This emotional connection has been discussed in relation to the proximity of care or “intimacy at a distance” that is enabled through use of technologies such as email, texting, webcam and video-links (Lupton & Maslen, 2017; Milligan & Wiles, 2010).

Kenney (2011) suggests that “mutually respectful relationships” within the midwifery partnership are “nurtured by te kanohi kitea

(the known face)” (p.132). Building relationships comes about through “sensory engagements” where health professionals and health consumers draw on senses when communicating with one another (Lupton & Maslen, 2017). The importance of the “known face” has been highlighted in other areas of healthcare where telehealth assessments have been undertaken. Gordon et al. (2020) noted that patients felt uncomfortable during a video telehealth assessment if they had not developed a prior relationship with their healthcare provider. Similarly, “seeing the person” online was enough for midwives to feel they could assess a woman in early labour (Faucher & Powell Kennedy, 2020; Spiby et al., 2019). It is arguable that sensory engagements are what create the difference between a physical face-to-face interaction versus a virtual one, particularly when people are unknown to one another.

The lack of sensory engagement or non-verbal communication is a possible explanation for why midwives were concerned with using an online platform without visual connection (Dalton et al., 2014). For the midwives in this study, “not seeing the person” meant they could not respond to facial expressions or see how the person responded to information provided. Conversely, the lack of face-to-face enabled pregnant women to ask their midwife questions they might not otherwise feel comfortable to ask *kanohi ki te kanohi* (face-to-face; Gasteiger et al., 2019; McCarthy et al., 2017). This has similarly been found in other areas of healthcare or online forums and such connections would therefore appear to provide a protective space for sensitive questions to be asked (Gleeson et al., 2019; Wallwiener et al., 2009).

While a lack of physical face-to-face connection has benefits with people being able to connect using technology, it can also highlight issues with users of communication technology feeling as though they always need to “be connected”. There are concerns that this need for always being connected has had implications with respect to people’s ability to form relationships during face-to-face interactions (Allred & Atkin, 2020; Gergen, 2002; Rotondi et al., 2017; Srivastava, 2005; Thompson & Cupples, 2008). Gergen (2002) discusses some of the challenges that mobile phone users have with relational communications when individuals are connecting with “absent others” while being present in the room with others. This challenge has been identified by midwives who were concerned they were competing with the phone when providing care to women following birth (Lewis et al., 2019). This in turn may have implications for the way midwives and pregnant women/people establish and navigate relationships face-to-face, where there is potential for distraction when communication devices are used to communicate with others outside of the room.

In summary, both midwives and pregnant women in this integrative review identified having a lack of knowledge and skills when using communication technology to communicate with one another. This would appear to fit with a report undertaken in 2017 in Aotearoa NZ which found that 50% of Aotearoa NZ workers had concerns about their digital capabilities (Zwimpfer et al., 2017). Using communication technology is here to stay; therefore, part of navigating these connections will need to involve midwives and pregnant women/people having discussions around how communication technology might be used effectively and competently throughout the perinatal journey.

CONCLUSION

The literature revealed that communication technology provided a platform for pregnant women/people to access maternity care in a manner that meets individual needs. Despite advances made to accessibility of communication technology over the last 30 years, there appears to be a gap in the published literature relating how

pregnant women/people and midwives are using and accessing the technology when communicating with each other. Many of the studies reviewed provided information either from the pregnant women and their partners or from health professionals. Only one study included both midwives and pregnant women and this was carried out in an online forum based in the UK. The only Aotearoa NZ study included pregnant women and their partners. This integrative review therefore highlights two significant gaps when considering how communication technology is used by midwives and pregnant people in Aotearoa NZ. These are in understanding firstly, how midwives and pregnant women/people use communication technology to communicate with each other and secondly, specifically how communication technology is used within a midwifery continuity of care model.

The model of midwifery care in Aotearoa NZ is well placed to explore how continuity of care enables midwives and pregnant women/people to use communication technology to connect.

The first author intends to focus on this issue for their doctoral level research.

Key points

- How midwives and pregnant women/people within Aotearoa New Zealand use communication technology to connect with one another is unknown.
- Studies examined in this review found that communication technology can save time and is convenient for both parties to share health messages and schedule appointments.
- There were also concerns, however, related to privacy, the ability to access and use technology, and the lack of connection when unable to see each other.

CONFLICT OF INTEREST DISCLOSURE

The authors declare that there are no conflicts of interest.

AUTHORS' STATEMENT ON GENDER INCLUSIVITY

In supporting the development and move towards using gender inclusive language, “antenatal women/people” has been used to include pregnant people who do not identify as women. The exception is in the description of the search terms which had been undertaken prior to writing up the review and in some of the discussion where “women” is used by the study authors.

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