Communication technology practices used by midwives with pregnant women/people in Aotearoa New Zealand to ensure quality maternal and newborn care

Karen J Wakelin*, Judith McAra-Couper, Tania Fleming, Gwen D. Erlam

Auckland University of Technology, 55 Wellesley Street East, Auckland CBD, Auckland 1010, New Zealand

ABSTRACT

Introduction: Communication technology such as texting is commonly used for sending appointment reminders and reinforcing health messages. Midwives have identified concerns with privacy of information or information taken out of context within an online format. How this technology is used to ensure quality maternal care within a continuity model of midwifery care is unknown.

Aim: To describe midwives' experiences of using communication technology with pregnant women/people in Aotearoa New Zealand.

Methods: A mixed methods design was used to collect online survey data from Lead Maternity Carer midwives. Recruitment was through closed midwifery Facebook groups in Aotearoa New Zealand. Survey questions were informed by the Quality Maternal & Newborn Care framework & findings and an integrative literature review. Quantitative data was analysed using descriptive statistics, and qualitative comments analysed using thematic analysis.

Findings: 104 midwives responded to the online survey. Phone calls, texting and emails were commonly used by midwives to reinforce health messages and decision making. Communication technology supported, and enhanced relationships midwives develop with their pregnant clients. Texting enhanced documentation of care and enabled midwives to work efficiently. Midwives, however identified concerns when managing expectations around urgent and non-urgent communication.

Discussion: Midwives are bound by regulations to ensure they provide safe care to pregnant women/people. Negotiating and understanding expectations around use of communication technology is vitally important to ensure that communications and connections are undertaken in a safe manner.

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Introduction

Effective communication requires there to be a mutual understanding between the sender and receiver whether they are verbal/non-verbal or face-to-face/non-face-to-face (O'Toole, 2016). Communication technology, particularly asynchronous such as texting is essentially a non-verbal/non-face-to-face form of communication which is increasingly being used within healthcare. They enable greater access to services through sending appointment reminders, reinforcing health lifestyle messages and disseminating results (Dobson et al., 2017; Goldfarb et al., 2016; Leahy et al., 2017; Wallwiener et al., 2016). Within midwifery, texting has en-

abled pregnant people to connect with midwives in order to seek advice or reassurance (Cummins et al., 2019; Shroder et al., 2018) and minimise barriers to accessing maternity care (Gasteiger et al., 2019). Midwives equally have utilised communication technologies to communicate with clients through offering contact with virtual midwives (McCarthy et al., 2017; Tranter and McGraw, 2017).

Concerns however have been raised with privacy and confidentiality, and around misinterpretation or information taken out of context (Leahy et al., 2017; Muller et al., 2016; Nettrour et al., 2019). Lack of technological skills or knowledge with using communication technology has also been identified as concerning both by midwives and perinatal women/people (Dalton et al., 2014; Faucher and Powell Kennedy, 2020; Spiby et al., 2019). This is an area that requires further investigation given that use of communication technology is part of society and effective communication is

* Corresponding author: Karen Wakelin, 15 Rona Street, Eastbourne, Lower Hutt, 5013, New Zealand.
E-mail address: karen.wakelin@autuni.ac.nz (K.J. Wakelin).

essential in the development of the relationship between the midwife and pregnant woman/person.

Effective communication was identified as a component of high-quality maternity care within an evidence-informed quality maternal and new-born care (QMNC) framework developed by leading global midwifery researchers (Renfrew et al., 2014). The researchers undertook an extensive systematic review of women's views and experiences of maternity care, and the effectiveness of maternity care practices by maternal and new-born care providers. Their findings showed that when care was accessible, individualised, respectful, tailored to women, and provided by culturally and professionally safe health practitioners; women felt strengthened and empowered.

In Aotearoa New Zealand (NZ), lead maternity carer (LMC) midwives work in partnership with the pregnant person and their whanau based on a model of continuity of care from early pregnancy through to six weeks postpartum (New Zealand College of Midwives, 2015). Using the QMNC framework is therefore ideal to explore how communication technology contributes towards quality maternal and new-born care.

There is little knowledge and understanding of how communication technology is being used between LMC midwives and pregnant people within a midwifery continuity of care model. This research seeks to answer two questions: How does communication technology enable LMC midwives and pregnant people to connect; and how does using communication technology contribute to quality maternal and new-born care.

Aim

The aim of this study is to describe Lead Maternity Carer midwives' experiences of using communication technology with pregnant people in their practice. This will identify both effective and ineffective communication technology practices to determine how the technology contributes towards quality maternal and new-born care.

Methods

This study reports the findings from phase 1 A of a multiphase study. Phase 1 A collected online survey data from LMC midwives through closed midwifery Facebook groups in Aotearoa New Zealand.

Questions for the survey instruments were informed by the QMNC framework (Renfrew et al., 2014) and findings from an integrative literature review undertaken as part of the research. (Wakelin et al., 2022). The findings from the survey with LMC midwives will then inform questions for interviews in phase two of the multi-phase study. This is reflective of a sequential transformative design which uses a theoretical framework to guide the study with data collected from one phase being reliant on or informing the data collected from another phase (Teddlie and Tashakkori, 2009). Ethical approval for the study was granted by XXXX Ethics Committee (XX 20/279).

Development of the survey tool

Preparing questions for the online survey was undertaken in two stages. Stage one included undertaking an integrative literature review to explore how communication technology was used to enable midwives and pregnant women/people to connect with one another. Four themes were identified from the review: (1) connecting; (2) access to healthcare; (3) privacy and confidentiality; (4) and lack of skills and knowledge (Wakelin et al., 2022). The findings from the integrative literature review were

then mapped onto four categories of the QMNC framework developed by Renfrew et al. (2014). The four categories of the QMNC framework informing the research are (1) organisation of care, (2) care providers, (3) values, and (4) Philosophy. The second stage involved validating the questions using an expert advisory group (EAG) of midwifery academics with experience in both quantitative and qualitative research designs (Wakelin et al., 2023). Content validity index was used to evaluate the clarity of the instrument (Polit et al., 2007) while Cronbach's alpha coefficient assessed the reliability of the survey instrument. (Pallant, 2016; Taber, 2018). These results were further validated through comments made by the EAG and provided certainty that the survey with LMC midwives would elicit appropriate responses. The online surveys were created using an online Research Electronic Data Capture tool (REDCap) (Harris et al., 2019).

Data analysis

The survey consisted of 25 questions which sought to identify how communication technology is being used by midwives and presented as descriptive statistics. Descriptive data was analysed using Statistical Package for Social Sciences (SPSS) for Windows version 27. Descriptive statistics are ideal for use when little is known of a phenomena, and are used to describe what is happening within a particular population (Gillis and Jackson, 2002). Qualitative responses were sought to expand on some of the questions and were analysed using a basic form of thematic analysis. Braun & Clarke identify a six-phase process for thematic analysis which was used for data analysis (Braun and Clarke, 2022). Data were initially colour coded and organised under areas of similarity, reviewed for commonalities and themes identified.

Setting

The online survey was advertised on two commonly used Midwifery closed Facebook groups within Aotearoa New Zealand from 27th July-31st August 2021.

Participants

In recruiting participants, the first author joined the two closed midwifery Facebook groups. Permission was sought (and granted) from the administration team to advertise the research. Midwives who met the criteria were invited to participate by clicking on a link which would take them to the online survey.

Criteria for midwives participating in this research:

- Midwives who have access to a mobile phone which has text / email / internet capabilities
- Midwives with a current practicing certificate
- Midwives working currently as a Lead Maternity Carer midwife

Results

This study reports on findings from phase 1 A of the multiphase study which describes midwives' experiences of using communication technology to connect with their pregnant clients. One hundred and four midwives responded to the online survey. Demographic data was sought relating to age based on a generation classification, the number of years spent as a midwife and years spent in LMC practice.

The age of midwives in this study are spread across all age groups with most falling in the Generation X (born between 1965 and 1980) and Millennials (1981–1996) classification. This is consistent with the average age of a midwife being 47 in Aotearoa NZ (Midwifery Council of New Zealand|Te Tatau o te Whare Kahu, 2021).
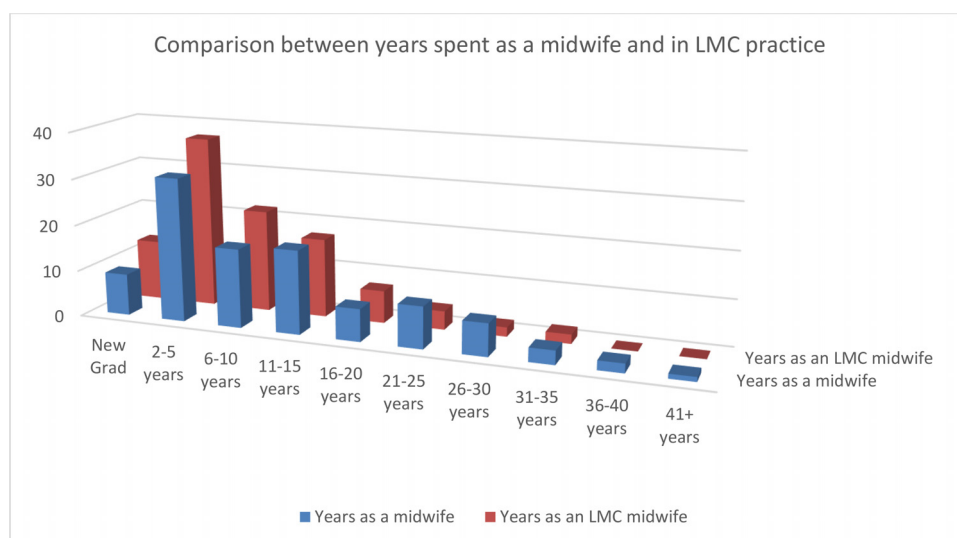
Fig. 1. Comparison between years spent as a midwife and years spent in LMC practice.

This study specifically sought the experiences of LMC midwives. Fig. 1 indicates, a widespread number of years participants have worked as a midwife, ranging from one to forty-one years, with nearly two thirds working between 2 and 15 years. When compared with time spent in LMC practice, over one third of participants (36%) have spent between two – five years, with just over 20% of midwives working between six-ten years. The number of midwives working within midwifery (or as LMCs) reduces considerably after this time, which is consistent with national midwifery workforce data (Midwifery Council of New Zealand|Te Tatau o te Whare Kahu, 2021).

The remaining results from the survey are presented using a mixture of quantitative and qualitative data.

Provision of midwifery services

Midwives were asked questions relating to location of midwifery practice, access to Wi-Fi or cell phone coverage, whether they provided continuity or shared care.

Ninety seven percent of the midwives surveyed provide continuity of midwifery care which includes antenatal, labour and birth, and postnatal care. This is provided in both urban and rural settings. Almost all midwives who responded to the survey have access to a mobile phone in their day-to-day practice followed by access to a computer or laptop. While mobile phone access is higher with midwives than the average population (Research New Zealand, 2015) this was not unexpected given the on-call nature of midwifery.

Access to wi-fi/internet services

Wi-Fi or cell phone coverage was problematic for 61% of midwives in this study. This potentially could create barriers for pregnant people trying to access antenatal services from their midwife. Midwives attempted to minimise these barriers by: (1) forwarding their calls to colleagues, or leaving a message to contact a midwifery colleague; (2) connecting to the women's Wi-Fi when at their home; (3) hot spotting from their phone or using mobile data on their phone plans; (4) carrying more than one phone or carrying a landline phone capable of running on batteries and (5) hand writing notes and then inputting into their computer system once in range. The latter was acknowledged as double handling but necessary. If midwives were unable to check laboratory results, they would check once back in Wi-Fi or cell phone coverage or would

contact a colleague to look up results for them. This highlights the lengths midwives will go to in ensuring pregnant people have access to maternity services and their midwife despite the infrastructure not always being available.

Given the concerns highlighted within the literature around privacy and confidentiality of information when using communication technology (Leahy et al., 2017) midwives were asked whether they used any privacy protection software on their communication devices. As shown in table one, sixty-two midwives (60%) reported using privacy protection software with nearly one third of midwives' using a combination of protective measures for their electronic devices. Forty percent of midwives did not respond to this question, so there is uncertainty whether they are using any privacy protection measures. This is potentially concerning given the increasing number of breaches of privacy information held on electronic devices (Lines-MacKenzie, 2022; Otago Daily Times, 2021) (Table 1).

Midwives' knowledge and skills with using communication technology

Midwives were asked questions to identify their comfort level and skills with using different communication technology platforms, and what resources they would turn to if needing to upskill themselves.

Comfort with technology

Midwives were asked how comfortable they were with using communication technology as well as types of communication technology their pregnant clients used to contact them. Fig. 2 indicates that midwives are extremely comfortable with phoning their clients which may indicate a preference for this form of contact especially if seeking clarification from text messages sent by pregnant people.

Ninety-three midwives reported that texting was the most common form of communication technology used by their pregnant clients to contact them. However, Table 2 indicates that all midwives would either phone or text depending on the nature of the text message and is further supported by comments made by midwives.

"Phone calls are good for assessments and advice when in person assessment is not necessary" (Qs 21: MW 54).

"I like the ability to answer non urgent enquiries via text" (Qs 21: MW 29).

Table 1
Privacy protection measures used by midwives.

Privacy protection software	N = 62
Pin codes/passwords/biometric technology/two-factor authentication	24
Anti-virus software	26
Maternity management protections	15
More than 1 protection	20
Built in computer updates programme	2
Did not state type of protection used	8
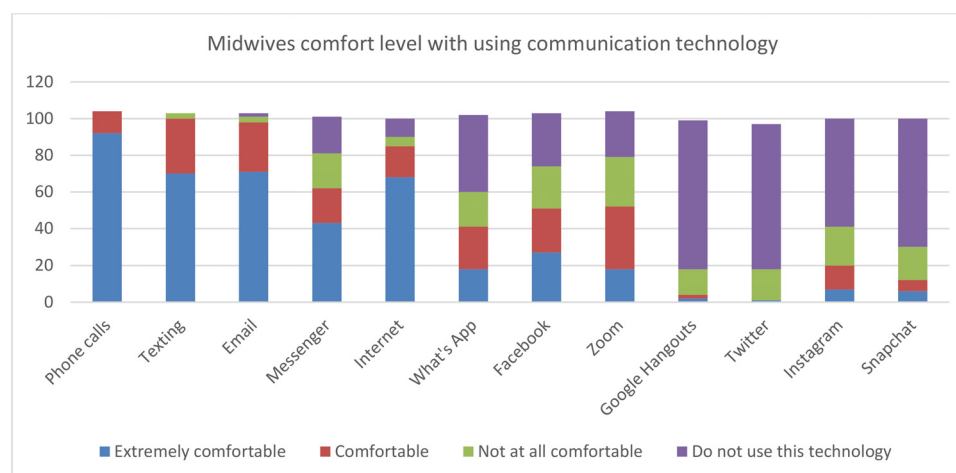
Fig. 2. Midwives comfort level with using communication technology.

Table 2
Communication technology use by LMC midwives.

	Phone call	Texting	Email	Messenger	Internet	What's App	Facebook	Zoom	Google Hangouts	Twitter	Instagram	Snapchat
Type of communication technology used when contacting pregnant people												
Yes	104	102	88	29	21	17	10	9				
No		1	8	17	19	17	22	29	15	15	17	14
Never		1	6	52	54	66	62	56	78	76	74	78
Missing			2	6	10		10	10	11	13	13	12
N = 104	104	104	104	104	104	104	104	104	104	104	104	104

Table 3
Sources of support midwives use for upskilling themselves.

Sources of support	Very Likely (%)	Likely (%)	Not Likely (%)	Total (missing)
Friends/family	65	25	10	100 (4)
Colleagues	63	29	8	102 (2)
Internet	61	31	8	104
YouTube	41	33	26	102 (2)
Enrol in a specific course	9	22	69	101 (3)
NZCOM	6%	24%	70%	101 (3)
Pregnant clients	4	10	86%	100 (4)
MOH	3%	11%	86%	101 (3)

Of interest, Google Hangouts, Twitter, Snapchat and Instagram were most indicated as never used by midwives when contacting their clients. They were also the modes of communication platforms that midwives felt least comfortable with using.

Upskilling

For midwives who needed to upskill themselves with using communication technology, friends and family, colleagues and searching the internet were most indicated as resources midwives would very likely use if needing help or support with communication technology (Table 3).

This is similar to other literature which indicates that friends and family (particularly children, who have grown up in this digital age) are sources people to turn to for help with communication technology (Zwimpfer et al., 2017).

The value with communication technology in supporting connections

Findings are reported here as comments made by midwives who recognise the value in having a variety of communication technology platforms for pregnant people to use when contacting their midwife. Data seems to suggest that pregnant people will use

the technology most easily accessible to them to maintain this contact.

> "Having a wide range of communication platforms aids women to access information and communicate in a manner that suits them" (Qs 21: MW 16).

For some, texting was preferable as it was convenient for the pregnant person, or they felt it easier to ask a question via text than face to face:

> "It is important that the provision of midwifery care is acceptable to the cohort of women – many women prefer to text and feel it is very convenient" (Qs 21: MW 39).

> "Easier for some women to ask questions via text" (Qs 21: MW 10).

For others, having the option to talk with their midwife over the phone instead of face-to-face was more comfortable:

> "Very helpful in one instance with a client with major anxiety as she was far more comfortable with phone contact than face-to-face" (Qs 21: MW 51).

This would appear to reiterate the findings in other research where non-face-to-face contact between health professionals and health consumers was found to be beneficial and less intimidating in enabling the person to seek the necessary support they required (Gasteiger et al., 2019; Wallwiener et al., 2009). Some midwives didn't always feel comfortable with the technology platform used by their pregnant clients however, they recognized the need to adapt and the insights this gave midwives of their clients and whānau.

> "Young Māori māmā, they FB message privately. At first, I did not like it, however, adapted as it gave me more access and insight into their concerns or questions outside whānau" (Qs 21: MW 86).

Midwives saw value in having a variety of communication technology platforms available. This enabled their pregnant clients to access the support and care they needed from their midwife, using technology that was most easily accessible to them. Communication technology also enabled midwives to use their time efficiently when responding to their clients.

Efficient use of midwives' time

Asynchronous communication such as texting or email meant midwives didn't have to immediately stop what they were doing to respond to their client with non-urgent queries. Midwives could take time to consider a response before replying.

> "It allows me a chance to answer a person back when I am free. I personally feel I answer back in a more comprehensive and easier to understand way when I am writing rather than with verbal communication" (Qs 21: MW36).

Texting enabled midwives to quickly confirm an appointment time or check in with someone without requiring a lengthy phone conversation.

> "Texting is so easy to confirm an appointment or check in with someone" (Qs 21: MW 11).

Being able to include or sync messages as part of documentation was an added time-saving benefit for midwives that supported them to practice in a more efficient manner.

> "I feel the use of technology can support practice efficiency – additional form of documentation within the partnership" (Qs 21: MW 20).

Communication technology provided midwives with flexibility to manage their time efficiently and support their practise in a more sustainable manner. It also enabled midwives to respond to their clients supporting the continuity of the midwife/pregnant person relationship.

Using communication technology to support midwifery continuity of care

Communication technology was seen as enhancing and supporting the midwife/client partnership through reinforcing health messages, undertaking screening and assessments and care planning.

Reinforcement of messages

Communication technology provided LMC midwives with an ability to connect with their pregnant clients to support or reinforce messages following assessments or conversations. These messages could be links to websites to support health information:

> "Good for sharing information. For example, I text pregnancy Web based resources after consultations" (QS 21: MW 18).

or a more detailed written response to support information shared through a conversation.

> "I also feel that if you are discussing something complex then putting that in writing via text or email gives ongoing access to your explanation…" (Qs 21: MW 39).

Benefits with using communication technology in supporting and promoting health and wellness in pregnant people was recognised by midwives, particularly when outside of scheduled antenatal appointments as indicated below.

Screening and assessments

Midwives used communication technology in partnership with pregnant clients to provide care that was flexible, empowering, and supportive. Communication technology, particularly asynchronous communication enabled instant messages or photos to be sent by pregnant people to their midwife as part of a virtual assessment. This was usually in response to a concern raised by a pregnant person. In some cases, photos were requested by the midwife to assist with decision making and provide further clarification on a plan of care.

> "the photo was sent after a phone conversation, due to a language barrier, I couldn't quite establish whether liquor following PROM was clear or meconium stained" (QS 16: MW 13).

In other cases, the midwife was able to respond and provide advice depending on the situation.

> "used photo to provide advice – very handy when an 'in person' visit not easy" (Qs 16: MW 12).

Communication technology supported the continuity of care relationship midwives have with their pregnant clients through enabling them to respond to concerns and help to alleviate anxieties pregnant people may have. Given the easily accessible nature of asynchronous communication, this at times posed problems or concerns for midwives.

Ineffective communication technology practices leading to concerns for LMC midwives

The nature of asynchronous communication means it is not occurring at the same time, and there may often be a delay in the sending or receiving of messages, or in the interpretation of messages. There were two main areas of concern identified by midwives in this study. These related to: (1) Misinterpretation of text messages; and (2) Challenges with managing expectations.
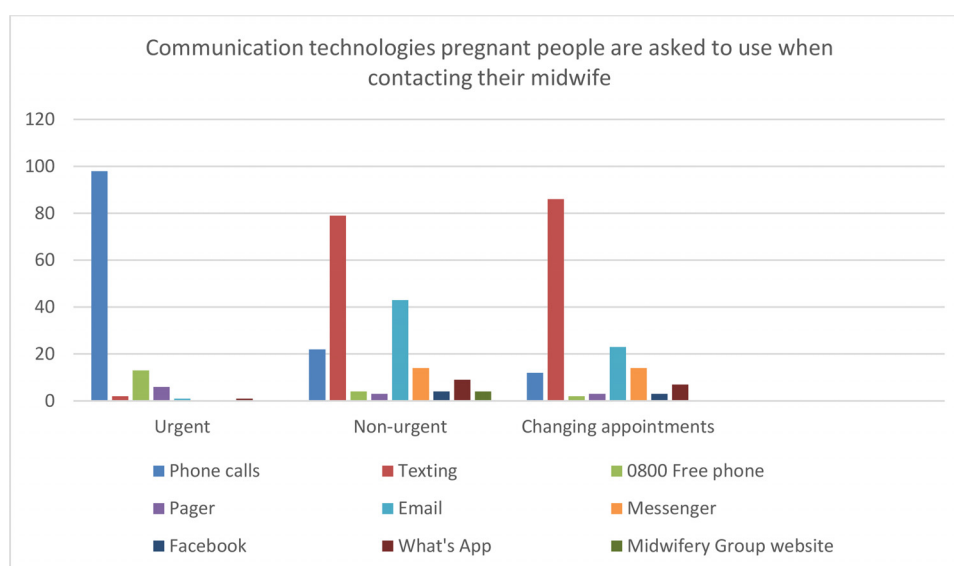
Fig. 3. Communication technologies pregnant people are asked to use when contacting their midwife.

(1) Misinterpretation of text messages

Midwifery Council of New Zealand |Te Tatau o te Whare Kahu have issued guidelines for midwives on use of texting and other social media platforms.(Midwifery Council of New Zealand|Te Tatau o te Whare Kahu, 2016a) When midwives were asked whether they had concerns when receiving text messages from pregnant people, 91% of midwives indicated there was concern all, some or most of the time, and this was around the interpretation of messages.

Misinterpretation of messages were acknowledged by midwives through not understanding what was said or in how it was said.

"text can't convey tone and can be misinterpreted…" (Qs 21: MW 58).

Misinterpretation of a message could mean that inappropriate advice or information is given as indicated by the following comment.

"Especially if I misinterpreted the women's communication or she doesn't understand my recommendations or requests" (Qs 23: MW 14).

While communication technology, provides a way for pregnant people to contact and connect with their midwife, at times, there appears to be a mismatch around expectations midwives have with how this technology is being used. This is highlighted further with challenges midwives have found in relation to expectations for urgent or non-urgent contact.

(2) Challenges with managing expectations

Midwives were asked to indicate which communication technologies they ask pregnant people to use when contacting them for urgent or non-urgent communications or with changing planned appointments. As can be seen below, almost all midwives ask pregnant people to call them with urgent concerns, and for texting to be used for non-urgent contact or changing appointments (Fig. 3).

The reality, however, is not always the case and midwives identified challenges and difficulties they have when pregnant people contact them in a way, they find concerning.

"I'm mostly worried that someone will in future leave me a text about something urgent (when they should have phoned) and that I'll miss that text" (Qs 23: MW 49).

Another issue identified by midwives which would seem to indicate an unwelcome intrusiveness were the expectations that they (midwives) should always be available to their clients.

"I also think it allows people to contact us at times they normally wouldn't make contact for non-urgent enquiries which can be difficult for work life balance" (Qs 21: MW 81).

Some of the comments made by midwives hinted at the concern they face when navigating the void or space that is created particularly with asynchronous communication. Use of communication technology is so widespread and accessible within the community, that expectations pregnant people may have around using technology to communicate with their midwife contrast with professional expectations expected of midwives when responding.

"I feel like it's fine for women to text, like they can do whatever they want. But I must call. I feel like I could get punished for texting women" (Qs 23: MW 33).

Considering these concerns, midwives had also developed strategies around how communication technology can be used to ensure good quality maternal care, while also helping to sustain themselves in practice.

Taking measures to minimise risk

LMC midwives appear to recognise the problems inherent with asynchronous communication, particularly texting so attempt to establish clear boundaries with their pregnant clients.

"Using auto-reply text responses after hours or when off call has been literally life-changing in terms of maintaining appropriate boundaries" (QS 21: MW 9).

Midwives will provide written information on when and how to be contacted for urgent/non-urgent concerns and after hours contact.

"I try to be really clear with women about not texting for urgent concerns and reinforce this if they revert to it. I put this in writing too at the beginning of our journey and redocument if need be" (Qs 23: MW 47).

For other midwives, strategies included following up synchronously either with a phone call or in-person visit, negotiating

with pregnant people various ways of contact, keeping records, and maintaining professionalism.

"I am very mindful that messaging etc. cannot take place of a phone call or in-person assessment and will follow up if clinical concerns are raised by message" (Qs 23: MW 22).

For other midwives, use of communication technology is something that is negotiated.

"As long as the communication is clear and you have had discussions with the woman regarding ways of communication and they are happy to communicate via technology, I don't see it being a problem" (Qs 23: MW 5).

While texting was identified as being open to misinterpretation, in other instances midwives found texting as 'proof' of what was communicated through written messages.

"I like that text messages give a written proof of what was said. Phone calls give no such evidence" (Qs 23: MW 37).

The midwives in this study appeared to identify the need for setting boundaries with their pregnant clients when using communication technology. While concerns have been identified, strategies for minimising risk were also mentioned – and all in a way to ensure that they are providing quality maternal care to their pregnant clients.

Discussion

The aim of this study was to describe midwives' experiences with using communication technology and how this enabled them to communicate and connect with their pregnant clients to ensure quality maternal and newborn care. LMC midwives identified how communication technology can be used effectively to ensure the provision of quality maternal care, while also identifying areas that were concerning. The results will be discussed under the two headings: identification of effective communication technology practices; and ineffective communication technology practices leading to concerns.

Identification of effective communication technology practices

Communication technology was found to support and enhance the relationship midwives develop with their pregnant clients, while also enabling midwives to use their time efficiently. Phone calls, texting, and email were most used by LMC midwives in this study to communicate and connect with their pregnant clients and were also the modes of communication that midwives were most comfortable using. This link between comfort and satisfaction increasing the more a communication tool is used has been similarly found in other studies (Swanson et al., 2018). However, there were differences with how midwives used the technology depending on the response required.

For pregnant people, texting was the most common form of communication technology used to contact midwives. This was not an unexpected finding given the ubiquitous use of communication technology and has similarly been reported on in other studies (Shroder et al., 2018). It is possible, that pregnant people are aware of how busy their midwife is, so texting provided an opportunity for pregnant people to connect with their midwife in the least disruptive manner thus allowing the midwife to respond when they were able. Midwives recognised that texting also provided pregnant people an opportunity to ask questions of their midwife that they didn't feel comfortable asking face-to-face which was similarly found in other studies (Gasteiger et al., 2019). These questions were asked despite continuity of care relationships developed between the LMC midwife and their client.

It likely reflects some concerns with communication technology, where people are potentially losing the ability to relate face-to-face (Allred and Atkin, 2020; Rotondi et al., 2017). Midwives however, still seemed to appreciate the insight that this gave of their clients that they otherwise would not have had.

Midwives commented on how beneficial they had found the use of video-technology especially during the Covid-lockdowns as it enabled them to maintain 'visual' contact with their clients. Of interest though, were midwives who did not feel comfortable using video technology to undertake antenatal assessments, however, they did so to maintain contact and connections with their pregnant clients through the Covid lockdowns being experienced at the time. While use of video technology has caused concerns for midwives as they couldn't see who else was in the room (Spiby et al., 2019) this wasn't a concern for midwives in this study. This may be due to midwives already having well-established relationships with their clients and whanau.

Midwives in this study recognised the value communication technology practices had in enabling them to sustain themselves in practice through working more efficiently. Use of communication technology to improve time management has similarly been found by general practitioners who used text messages to communicate with patients rather than a more time consuming phone call (Leahy et al., 2017). While midwives also indicated this was beneficial, especially when confirming an appointment, another benefit was the ability for text messages to be copied and included as part of documentation which provided evidence of discussions and communications that had occurred between the midwife and pregnant woman/person. Being able to include or sync messages as part of documentation was an added time-saving benefit for midwives that supported them to practice in a more efficient manner. This was especially so for midwives working in a rural area. They were able to work offline and then sync information once in internet connection range. For others though, non-syncing of information resulted in double handling as assessments were documented on paper and then transferred to an electronic device. This double handling of information was not an efficient use of the midwife's time.

Ineffective communication technology practices leading to concerns

Two main concerns identified by midwives in this study concerned text messages being sent for urgent matters and the need for setting boundaries and creating a work/life balance.

Midwives recognise the need to negotiate how communication technology is to be used and may be quite prescriptive around urgent/non-urgent concerns. However, one third of midwives indicated that pregnant people were still texting for urgent concerns. This concern is not unfounded given the potential for misinterpretation of text messages which has been identified in other health areas, and particularly within midwifery (Barker et al., 2012). The nature of texting has changed over the years. While initially intended as an informal way to briefly send messages, texting has evolved into a language which integrates a mixture of alphabetical, numerical and emoticon messages to communicate (Crystal, 2008; Tagg, 2012).

The expectations and ease within which communication technology has become a mainstream part of our social structure, has definite implications within a healthcare environment that may not be so evident in 'ordinary' life. Midwives (as are other health professionals) are bound by regulations to ensure the care they provide the public is safe (Midwifery Council of New Zealand|Te Tatau o te Whare Kahu, 2018). This includes how they use communication technology with their pregnant clients and expectations around for example texting vs a phone call (Midwifery Council of New Zealand|Te Tatau o te Whare

Kahu, 2016b). Pregnant consumers are not bound by these professional regulations when using communication technology with their midwife and may not appreciate the difference in information obtained between a text vs a phone call. Negotiating how this technology is used and understanding expectations around its use is vitally important to ensure that communications and connections are undertaken in a safe manner.

The relationships that midwives develop with their pregnant clients through a continuity of care model and the challenges for LMC midwives in finding a balance between meeting the needs of their clients and setting boundaries around their own space is not new (Engel, 2003; McLardy, 2002; Wakelin and Skinner, 2007). However, texting communication and expectations around instantaneous responses, added another layer to the challenges LMC midwives' experienced. Communication technology had led to some midwives feeling they always had to be connected and to respond to their clients immediately. The phrase 'k-synchronous' has been coined where there is an expectation that asynchronous communication (such as texting) is used synchronously (Robinson and Stubberud, 2012). This expectation was managed in different ways by the LMC midwives in this study. When an immediate response was not possible, strategies were developed by midwives to ensure their clients would still have access to midwifery services. This took the form of auto-reply text messages, setting up call forwarding to colleagues, or using two different phones by different internet providers. These measures have been undertaken in a way that enables pregnant people to access and connect with their midwife.

Another concern identified from this study was with the 40% of midwives who did not indicate they used any privacy protection measures on their electronic devices. The Office of the Privacy Commission include information outlining individuals or organisations responsibilities with ensuring personal information is stored securely (Privacy Commissioner|Te Mana Mātāpono Matatapu, 2020). Since data collected from this survey, the New Zealand College of Midwives have now created a Keteparaha (toolkit) for record keeping which provides information for midwives on documentation requirements when using communication technology (New Zealand College of Midwives|Te Kāreti o Nga Kaiwhakawhanau ki Aotearoa, 2021). Midwives, however, still need to negotiate effective communication technology practices with their clients to ensure quality maternal and newborn care.

Limitations

A limitation to this study is the small sample size and missing responses from some LMC midwives. Advertising the study on a closed Facebook group was likely limiting given it requires an almost immediate response otherwise the post is quickly overtaken by more recent posts. These posts therefore may not have been seen by LMC midwives. Furthermore, the voices of pregnant people are not as visible in this research. This will be addressed in another article.

How midwives negotiate contact with pregnant people who may not have access to Wi-Fi or money on their phone is unknown, and this will be explored further in interviews with midwives in the second phase of the study.

Conclusions

Midwives use communication technology in partnership with their pregnant clients to provide care that is flexible, empowering, and supportive. Texting enabled midwives to use their time efficiently through screening and care planning. It is however the use of text messages which can be copied to support documentation of events that was of real benefit to midwives in this study. Concerns were identified with the potential for missing or misinterpreting

messages, and expectations midwives have of always needing to 'be connected'. It appears that the concerns raised by midwives about using communication technology will require them to develop strategies to ensure their pregnant clients continue to have access to quality maternal care.

Author contributions

This manuscript is the first author's (Karen Wakelin) original work and will be included as part of her PhD via publication.

The article has not received prior publication and is not under consideration for publication elsewhere.

All authors have seen and approved the manuscript being submitted.

Ethical approval

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Declaration of Competing Interest

There is no conflict of interest in the presentation of this manuscript.

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CRediT authorship contribution statement

Karen J Wakelin: Conceptualization, Formal analysis, Investigation, Writing – original draft. **Judith McAra-Couper:** Conceptualization, Writing – review & editing. **Tania Fleming:** Conceptualization, Writing – review & editing. **Gwen D. Erlam:** Conceptualization, Writing – review & editing.

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