Using a midwifery quality care framework to explore the use of communication technology between LMC midwives and pregnant women/people in Aotearoa New Zealand: A mixed method approach.

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Abstract

This PhD thesis aimed to explore how communication technology is used between Lead Maternity Carer midwives and pregnant women/people in Aotearoa New Zealand, and how this contributes towards quality maternal and newborn care. A mixed method multi-phase sequential transformative design is used, using the quality maternal and newborn care (QMNC) framework developed by leading international midwifery researchers. This PhD thesis has been undertaken with publication and consists of ten chapters which include six published papers, one paper accepted for publication, and two papers under review for publication.

The first publication is an integrative literature review which involved systematically reviewing a variety of research methodologies to explore how communication technology enabled midwives and pregnant women/people to connect. The findings were mapped onto categories from the QMNC framework, which then informed questions for the online surveys.

In the second publication, an expert advisory group of midwifery academic researchers experienced in both quantitative and qualitative research were asked to assess the reliability and validity of questions for use in online surveys. Analysis was undertaken using content validity index and Cronbach's alpha coefficient. Further consideration was also given to qualitative comments provided by the group. This provided reassurance to move to phase one of data collection.

In phase one, data was collected from LMC midwives and pregnant women/people with findings presented as publications in chapters five and six. The findings indicated that phone calls, texting and emails were commonly used by LMC midwives to reinforce health messages and decision making. Texting was beneficial in aiding documentation and enabled midwives to work efficiently. However, concerns were identified when managing expectations around urgent and non-urgent communication.

For pregnant women/people, texting was the most common form of communication technology used, while technologies associated with social media were seldom used by pregnant people or midwives. Privacy and confidentiality of information was not a concern for pregnant women/people with 79% of pregnant people not using security measures on their devices.

In phase 2, online semi-structured interviews were conducted with LMC midwives (2A) and pregnant women/people (2B). In the fifth publication, insights are offered around the valuable contribution that online interviewing can offer as a valid research tool that differs to that of in-person face-to-face interviews.

Three themes were identified from interviews with midwives. In theme one, communication technology was found to enable midwives and pregnant women/people to connect through having space and distance to consider and respond to messages. In theme two, continuity of care gave midwives a 'knowingness' of their clients which enabled them to negotiate safe and appropriate means for contact and to develop strategies to ensure access and connection. In the final theme, midwives were balancing the convenience of the technology with the relationship they develop with their pregnant clients, while ensuring privacy and confidentiality of information, and maintaining their own work/life balance.

Three themes were identified from interviews with pregnant women/people. The importance of being known within a continuity of care relationship, reassurance that was provided through the flexibility and convenience of the technology and the professionalism of the midwife that instilled trust with the way the midwife used technology to respond.

Communication technology when used within a model of continuity of care, was found to compliment the relationship that is developed between LMC midwives and pregnant women/people. While more work is needed with managing the divide between societal and regulatory body expectations, communication technology provided solutions for midwives in creating a more sustainable work/life balance which is crucial for the sustainability of midwifery practice.

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Signed

Karen Wakelin

Date: 7th May 2024

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Acknowledgements

First and foremost, I wish to thank the midwives and pregnant women/people who generously gave their time to complete an online survey and participate in interviews. Without you, this research would not have been possible. I hope I have enabled your voices to be heard.

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- Judith, you suggested I complete this PhD with publication – something I had not been aware of before. I was a little dubious at first, but what a great suggestion that was and a fantastic way to honour the participants experiences.
- Tania, you completed your PhD with publication, which was inspirational to me and showed me how this could be done.
- Gwen, while you were only involved during a short period of supervision, you brought valuable insights from outside of midwifery.

To my friends and colleagues, thank you for your support and encouraging words. Chris, your valuable tip to 'just keep writing' reminded me of a little blue fish called Dory in the movie 'Finding Nemo' where she kept saying "just keep swimming…". My mantra became, "*just keep writing…just keep writing…".*

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To mum and Dad, thank you for instilling those values into me from such an early age, to always do my best. This I believe, is my best.

Acknowledgement of language

Throughout this thesis, and where possible, the term pregnant woman/person has been referred to in acknowledgement that not all pregnant people identify as women. The exception to this is within the integrative literature review where the term antenatal women/people has been used, and with the description of the search terms which had been undertaken prior to writing up the review. Other situations where the term woman(en) is used are in reference to the Quality Maternal and Newborn care framework, where the researchers (Renfrew et al. 2014) have referred to 'women' in the writing up of their framework.

Acknowledgement of ethics approval

Ethical approval was obtained from Auckland University of Technology Ethics Committee (AUTEC) on 25th September 2020. Reference number: 20/279.

Acknowledgement of published papers and papers under review for publication

This thesis includes six published papers in chapters 2, 4, 5, 6, 7 and 8.3. One paper has been accepted for publication in chapter 8.2 with two further papers under review for publication in chapters 8.1 and 9. All published and unpublished papers have been co-authored with my supervisors. My contribution to each co-authored paper is outlined at the beginning of the relevant chapter. The details of these papers including authors are:

Chapter 2

Wakelin K., McAra-Couper J., Fleming T., Erlam, G. (2022). Exploring the ways communication technology is used by midwives and pregnant women/people: An integrative review. *New Zealand College of Midwives Journal* (58): 11–18. https://doi.org/10.12784/nzcomjnl58.2022.2.11-18.

My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), Dr Tania Fleming (Secondary Supervisor) and Dr Gwen Erlam (Assistant Supervisor) involved: preparing and submitting the ethics application, conceptualisation, formal analysis, investigation, and writing of the integrative literature review.

Chapter 4

Wakelin, K., McAra-Couper, J., Fleming, T., & Erlam, G. (2023). A process for assessing the reliability and validity of questions for use in online surveys: Exploring how communication technology is used between Lead Maternity Carer midwives and pregnant people in Aotearoa New Zealand. *Methodological Innovations*, *January*, 1–11. https://doi.org/10.1177/20597991221148401%0A%0A

My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), Dr Tania Fleming (Secondary Supervisor) and Dr Gwen Erlam (Assistant Supervisor) involved: preparing and submitting the ethics application, conceptualisation, formal Analysis, investigation, and writing of the original paper.

Chapter 5

Wakelin, K. J., McAra-Couper, J., Fleming, T., & Erlam, G. D. (2023). Communication technology practices used by midwives with pregnant women/people in Aotearoa New Zealand to ensure quality maternal and newborn care. *Midwifery*, *120*(103637). https://doi.org/10.1016/j.midw.2023.103637

My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), Dr Tania Fleming (Secondary Supervisor) and Dr Gwen Erlam (Assistant Supervisor) involved: preparing and submitting the ethics application, conceptualisation, formal Analysis, investigation, and writing of the original paper.

Chapter 6

Wakelin, K., McAra-Couper. J., Fleming. T. (2023). Survey results describing how pregnant women/people use communication technology with their midwife in Aotearoa New Zealand. *The Practising Midwife 2*(01), 24-29. https://doi.org/10.55975/HDNG1858

My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), and Dr Tania Fleming (Secondary Supervisor), involved: preparing and submitting the ethics application, conceptualisation, formal analysis, investigation, and writing of the original paper.

Chapter 7

Wakelin, K., McAra-Couper, J., Fleming, T. (2024). Use of online platform for conducting face-to-face interviews with midwives and pregnant women/people. *International Journal of Qualitative Methods, 23.* https://doi.org/10.1177/16094069241234183.

My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), and Dr Tania Fleming (Secondary Supervisor), involved: preparing and submitting the ethics application, conceptualisation, formal analysis, investigation, and writing of the original paper.

Chapter 8.1

Wakelin, K., McAra-Couper, J., Fleming, T. (20XX). Communication technology facilitates quality of care through enabling connection: Midwives' experiences with using communication technology with their pregnant clients. Submitted to *New Zealand College of Midwives Journal.* Under review.

My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), and Dr Tania Fleming (Secondary Supervisor), involved: preparing and submitting the ethics application, conceptualisation, formal analysis, investigation, and writing of the original paper.

Chapter 8.2

Wakelin, K., McAra-Couper, J., Fleming, T. (20XX). Communication technology facilitates quality of care through a continuity of care relationship: Midwives' experiences with using communication technology with their pregnant clients. Accepted for publication with the *International Journal of Childbirth.*

My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), and Dr Tania Fleming (Secondary Supervisor), involved: preparing and submitting the ethics application, conceptualisation, formal analysis, investigation, and writing of the original paper.

Chapter 8.3

Wakelin, K., McAra-Couper, J., Fleming, T. (20XX). It's about getting the balance right: Midwives' experiences with using communication technology with their pregnant clients. *International Journal of Childbirth.* http://dx.doi.org/10.1891/IJC-2024-0004.

My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), and Dr Tania Fleming (Secondary Supervisor), involved: preparing and submitting the ethics application, conceptualisation, formal analysis, investigation, and writing of the original paper.

Chapter 9

Wakelin, K., McAra-Couper, J., Fleming, T. (20XX). It's a given now, that's just how we communicate": Pregnant women/people's experiences with using communication technology

when connecting with their midwife. Submitted to *New Zealand College of Midwives Journal*. Under review.

My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), and Dr Tania Fleming (Secondary Supervisor), involved: preparing and submitting the ethics application, conceptualisation, formal analysis, investigation, and writing of the original paper.

Permission to embed the post-print and published version of the papers has been granted by the journal publishers (see Appendix A).

Signed:

Karen Wakelin Date: 7th May 2024

Countersigned: Date: 7th May 2024

Corresponding author and Principal Supervisor: Professor Judith McAra-Couper

Countersigned: Date: 7th May 2024

Corresponding author or paper and second supervisor: Dr Tania Fleming

Conference paper arising from the thesis.

Wakelin, K., McAra-Couper, J., Fleming, T. (2023). Results from two online surveys on how communication technology is used between LMC midwives and pregnant women/people in Aotearoa New Zealand. New Zealand College of Midwives Conference, Christchurch, New Zealand. 2-4 November 2023.

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Chapter 1

Introduction

> *"To effectively communicate we must realize that we are all different in the way we perceive the world and use this understanding as a guide to our communication with others"* (Tony Robbins).

This quote attributed to Tony Robbins highlights what is needed for us as individuals to communicate effectively (Robbins, n.d.). This has relevance whether communicating synchronously (in-person face-to-face or via a phone call) or asynchronously (using the myriad of communication technology platforms that are available). There is recognition both internationally and nationally on the need to ensure access to communication technologies to enable effective communication and connections both within maternity and the wider health system (New Zealand Health and Disability System Review, 2019; World Health Organization, 2016, 2021).

This PhD research sets out to explore how communication technology is used between Lead maternity carer (LMC) midwives and pregnant women/people within a midwifery model of continuity of care in Aotearoa New Zealand (NZ). The research has taken place during the global Covid-19 pandemic, and as such, has had potential implications on the way communication technology was used between LMC midwives and pregnant women/people. This chapter describes the background and rationale for undertaking this body of work and outlines the significance with undertaking a thesis with publication. A brief outline is provided of the methodology and my interest in choosing to focus on this project. The chapter concludes with a brief precis of each of the chapters of the thesis.

Research Questions and aims:

There are two overarching questions informing this PhD research.

1. How do LMC midwives and pregnant women/people use communication technology to connect with one another and

2. How does communication technology contribute towards quality maternal and newborn care.

The PhD research is conducted over two phases of study. The aim of phase one of the study was to gain some insight into how the technology was being used between LMC midwives

(phase 1A) and pregnant women/people (phase 1B). An online survey would enable data to be collected from around the country and include both urban and rural locations.

The aim of phase two was to explore in greater detail the issues identified from the online surveys. The aim of phase 2A was to explore LMC midwives' perspectives with how communication technology has enabled effective communication and to identify what if any challenges there were when using communication technology to connect with pregnant women/people. The aim of phase 2B was to explore pregnant women/people's perspectives on how they use communication technology when connecting with their midwife and to identify what was important when connecting in this way. The findings from the semi-structured interviews with LMC midwives and pregnant women/people are provided in chapters eight and nine as a published paper, a paper accepted for publication and papers under review.

Rationale and Significance of the study

We are well entrenched in what could be considered the 'digital age' of communication, where communication technologies enable people to connect almost instantaneously (Baggio, 2016). To be able to communicate effectively within this 'digital age' there is reliance on understanding not only the meaning behind the communication, but in having access to the technologies to be able to communicate in the first place. In Aotearoa New Zealand (NZ), the recent publication of the Te Pae Tata health action plan sets out steps needed to ensure health services are able to meet the health and wellbeing needs of people within communities regardless of who they are or where they live in NZ (Te Whatu Ora |Health New Zealand, 2023). This research therefore will provide important information to identify how communication technology enables pregnant women/people to access and connect with their Lead maternity carer (LMC) midwife and to identify what challenges there are with using the technology.

A review of the literature identified little information on how midwives and pregnant women/people use communication technology to communicate with one another and the impact this may have on quality care. What information was available, was largely based in countries which have a different model of midwifery care to what is offered in NZ (Dahl et al., 2017; Dalton et al., 2014; Faucher & Powell Kennedy, 2020; Forti et al., 2013; Gasteiger et al., 2019; Lewis et al., 2019; McCarthy et al., 2017; Shroder et al., 2018). Only one study conducted within NZ explored postnatal women's and their partner's experiences with using communication technology with their midwife (Gasteiger et al., 2019). A gap therefore was identified with how communication technology was used between LMC midwives and pregnant women/people. The decision was made to focus on pregnant women/people, as this

would provide insight into how communication technology is used as part of establishing the relationship developed between LMC midwives and pregnant women/people within a midwifery model of continuity of care. This would also enable exploration of the impact communication technology has on quality maternal and newborn care.

The evidenced informed Quality Maternal and Newborn Care (QMNC) framework developed by leading midwifery researchers offered an opportunity to explore how communication technology can be used effectively to contribute towards quality maternal and new-born care (Renfrew et al., 2014). This then became the focus of this PhD research.

Positionality

My interest in this project was sparked with the headline 'Midwife used text to diagnose woman' (Sharpe, 2012). My interest has always been in the midwifery relationships developed with childbearing people and their families. I was familiar with texting friends and family, but it never occurred to me to text someone in a professional capacity such as a pregnant client. I wanted to know how the technology was being used given everyone was seemingly texting. I also wanted to know what the pitfalls were in using the technology. How safe was it to use asynchronous information to impart information.

I became aware of some of the challenges faced by LMC midwives several years ago while working as a midwifery manager in a secondary care hospital in NZ. At this time, smart phones weren't commonly used, nor was the ability to have automatic replies to text messages available. Pregnant women/people would contact their midwife either through phone calls, a paging service, or via text messaging directly with the midwife. Lead maternity carer midwives providing continuity of care had already identified challenges they were facing at this time in trying to establish boundaries between work and personal space (McLardy, 2002; K. Wakelin & Skinner, 2007). Advances in communication technology and the expectation of instant responses, appeared to add to challenges for midwives in how to navigate this way of communicating. I recall being shown a thread of text messages that a midwife had received while she had been overseas on holiday. These messages came, despite the person at the time knowing the midwife was away and had been instructed to contact the back-up midwife for any concerns.

As texting became more common, the potential negative implications for using communication technology between midwives and childbearing people became apparent with further headlines following a flurry of complaints made by women around poor communication

practices that largely related to the use of text messaging (Health and Disability Commissioner, 2013a, 2013b, 2014a, 2014b, 2016).

As I pondered this, observed, and spoke with LMC colleagues, I decided this was an area that needed further investigation. I have never been particularly 'tech savvy', so this was going to be a steep learning curve for me into everything communication technology related. As I have journeyed through this project, I have been amazed at the resourcefulness of LMC midwives in using the technology, and the varied options available to people to assist them with gaining access and connecting with their midwife. Mostly though I have been struck by how the technology when used within a continuity of care relationship can enhance and compliment the relationships LMC midwives and pregnant women/people develop. I specifically chose to focus on pregnant women/people as I thought this would highlight the advantages and or disadvantages with the technology when midwives and pregnant women/ people navigate the relationship journey together.

In undertaking this journey exploring how communication technology is used, I couldn't help but notice some similarities along the way with how I was conducting this PhD research journey. I found keeping electronic records and spreadsheets was incredibly helpful in helping me to organise data files and this was a convenient way to share information with my supervisors given we lived in different geographical locations. The ability to share my screen via Teams to discuss an aspect of the research was incredibly helpful, as was the ability to receive feedback via a shared document. Electronically being able to create versions and copy and paste text has been beneficial in the writing, drafting, reviewing, and collating large pieces of information. I would also email myself insights I discovered or thoughts that came to me while away from my computer. So, this PhD journey has been one of growth in all aspects, from undertaking the research process itself, to the familiarity with how technology can be used to assist with communications.

Background

The ubiquitous use of communication technologies is across every facet of life within NZ. At the time this PhD research was conducted, the population of NZ in 2021 was 4.84 million people, with 4.55 million internet users, 3.97 million social media users and 6.56 million mobile connections (Kemp, 2021). By early 2023, NZ's population had grown to 5.21 million, with 4.99 million internet users, 4.24 million social media users and 6.54 million mobile connections (Kemp, 2023). Of interest, is the number of mobile connections which is greater than the population, suggesting that New Zealanders are 'digitally active'. Coincidently, during this time, there had been a 41 percent increase in privacy breaches from the 2021/22 to 2022/23

(Webster, 2023). The significance of this growth in communication technology use alongside breaches in privacy raises concerns when considering the potential implications between health professionals and consumers of healthcare services, regarding how the technology is used.

Effective communication is an important aspect of the midwife/pregnant person relationship (Midwifery Council |Te Tatau o te Whare Kahu, n.d.-a). The model of midwifery practice within Aotearoa NZ is one of 'partnership' and continuity of care developed by Guilliland and Pairman (Guilliland & Pairman, 1994). A trusting relationship is developed between the LMC midwife and childbearing woman/person (and their family) throughout the childbearing episode from pregnancy, through to discharge, which currently is from four-six weeks postnatally (Midwifery Council |Te Tatau o te Whare Kahu, n.d.-b; New Zealand College of Midwives, 2015). This model of care came about with the passing of the Nurses Amendment Act 1990 which enabled midwives to practice without the need for medical supervision and heralded the reinstatement of autonomy to midwives, and to the childbearing people and their families for whom care was provided (Department of Health, 1990).

While the 1990's was a significant time for midwifery practice within Aotearoa NZ, it was also significant in heralding the changes to the way people would use technology to communicate. The implications for this change came about when a software programmer sent a text message from his computer on the 3rd December 1992 wishing a colleague a 'Merry Christmas' (Gupta, 2013). Young people became the early adopters of this new technology as it provided an opportunity to connect quickly to their peers and to establish independence from parents (Ling, 2010; Ling et al., 2011; Robinson & Stubberud, 2012; Skierkowski & Wood, 2012). As these young people aged and had children of their own, the term 'digital natives', and 'digital immigrants' became synonymous with differentiating between users of technology, those who had grown up with the technology (digital natives) vs those who adopted the technology into their life (digital immigrants) (Prensky, 2001, 2009). The ease and convenience for connecting with others quickly brought with it expectations for quick responses due to the phone becoming an extension of the person, and always 'being carried on the person' (Kneidinger-Müller, 2017).

This would potentially have implications for LMC midwives, who in providing continuity of care, to their clients meant they were easily contactable due to the nature of the relationship. LMC midwives within this context, are the only primary maternity care providers where the childbearing person has immediate access to their midwife. In other healthcare settings, contact with a health professional would usually take place via a receptionist at a clinic or

hospital. The increasing digitalisation of 'society', and the ease with which LMC midwives can be contacted by their clients, raised questions around what was happening in this communication technology space. This is especially so given the current midwifery workforce shortage in NZ, which in 2023, was identified at around 40% (Te Whatu Ora|Health New Zealand, 2023b). Further to this, was the impact that the global Covid-19 pandemic was having on society, and the implications for LMC midwives practising within the community.

On the 23rd March 2020, NZ was placed in alert level 4 lockdown which required everyone other than essential workers to stay at home to try and stop the spread of Covid-19 (New Zealand Government, 2020). Lead maternity carer midwives, as essential workers, were encouraged to hold virtual appointments unless a face-to-face appointment was necessary, and where this was the case, to limit contact to no more than 15 minutes (Ministry of Health [MOH], 2020; New Zealand College of Midwives, [NZCOM] 2020). Midwives were undertaking phone risk assessments to determine if the childbearing person or anyone in their household was unwell and could potentially be at risk of Covid-19 before deciding whether a face-to-face visit would be warranted. During 2020-2022, midwives anecdotally were expressing their concerns around communication that was happening during this time, at monthly regional NZCOM meetings that I attended.

The potential impact on covid-19 would have implications on the undertaking of the research itself, particularly during the second phase of the research, where semi-structured interviews were to be conducted with LMC midwives and pregnant women/people. Having already begun my PhD journey into communication technology, this 'pandemic' would provide further impetus for exploring how communication technology was being used between LMC midwives and pregnant women/people.

The concerns identified around how communication technology was being used between LMC midwives and pregnant women/people led to the undertaking of an integrative literature review (chapter two). This integrative review identified very little information that explored how communication technology was used between pregnant women/people and midwives. While benefits and concerns were identified within this integrative review, (and will be discussed further in chapter two), it was difficult to extrapolate these findings to Aotearoa NZ, where a midwifery continuity of care model is the norm. This therefore became the focus and interest for this PhD research and led to the development of the two research questions.

Methodology

A mixed methods multi-phase sequential transformative design was used to conduct this PhD research. This approach would provide greater understanding of how communication

technology was used between LMC midwives and pregnant women/people by incorporating a mixture of quantitative and qualitative methods. Conducting the research over two phases, would enable an initial description of how the technology was being used. The second phase enabling further exploration into the issues identified. The Quality Maternal and Newborn Care (QMNC) framework is used as the theoretical framework to guide the research.

Renfrew et al., (2014), undertook a systematic review and identified characteristics that were needed to ensure quality maternal and newborn care. These characteristics were identified as 1) practice categories (what is important for childbearing women/people, 2) philosophy of care, 3) values, 4) organisation of care, 5) characteristics of care providers. The focus of the QMNC framework is on strengthening the woman's/pregnant person's capabilities and ensuring care is tailored to meet their needs. It does this through "identifying what a health system needs in order to provide high-quality care and how it delivers its functions and meets its goals within any particular context" (Renfrew et al., 2014, p. 11). The model of midwifery care in NZ is considered internationally to be a 'gold standard' model of care (Sandall et al., 2016). The QMNC framework was therefore ideal to explore how LMC midwives and pregnant women/people use communication technology to connect with one another, to consider the impact on care, and whether it was able to meet the needs of pregnant women/people.

The QMNC framework has been used as an evaluation tool for the delivery of antenatal care services in Scotland (Symon et al., 2018, 2019) and to explore the qualities of midwifery led continuity of care in two diverse settings in Australia (Cummins et al., 2019). Symon et al. (2018, 2019) held focus groups with women, midwives and obstetricians and designed questions around each of the characteristics of the model. Only one theme from the focus groups mapped directly back to the model, with other themes interconnecting between the different categories. The authors found that while the characteristics of the framework were written positively around what good quality care should look like, their study identified both positive and negative aspects of care. In a similar way, Cummins et al. (2019) held focus group in each of the settings in Australia with pregnant women / new mothers and midwives. The findings from their study when mapped back onto the QMNC framework highlighted areas which reflected good quality maternal care and areas which required further attention to meet the needs of the women. Using the QMNC framework therefore provided a useful tool for evaluating the strengths of this model of care along with areas which required more comprehensive evaluation (Cummins et al., 2019; Symon et al., 2018, 2019).

In a similar way, the QMNC framework has guided this PhD research. It started with the mapping of findings from the integrative literature review and in the design of questions for phase one, the online survey.

Phase one collected data via online surveys with LMC midwives (phase 1A) and pregnant women/people (phase 1B). Questions for the survey were developed using a two-step process. The first step was informed by the findings from an integrative literature review (a published paper presented in chapter two) and the QMNC framework. The second step involved using an expert advisory group of midwifery academics to assess and validate the questions. (Presented as a published paper in chapter four). A combination of quantitative and qualitative data was collected in the online survey. Descriptive analyses were used to analyse the quantitative questions with thematic analysis used on the qualitative comments. The findings from the two surveys are presented as published papers in chapters five and six. The findings from these two studies informed questions for semi-structured interviews in phase two.

Phase two involved conducting face-to-face semi-structured interviews using an online platform (presented as a published paper in chapter seven). The interviews were recorded and transcribed using the built-in function on the platform. Thematic analysis was used to analyse the online interviews. The findings from interviews with LMC midwives and pregnant women/people are presented as chapters eight and nine (as a published paper, a paper accepted for publication and papers under review). In the final discussion chapter, (chapter 10), the findings from the two phases of study are interwoven using the QMNC framework. These are discussed around the effectiveness and challenges of using communication technology within the QMNC framework.

Organisation of this thesis

This PhD thesis consists of ten chapters, which include published papers, papers accepted for publication and papers under review. This thesis has been prepared in accordance with the Graduate Research School, Auckland University of Technology policy (Auckland University of Technology, 2023). A requirement in the formatting of this thesis was for consistency of referencing. APA 7th edition is used throughout this thesis, however, the published papers appearing in the appendices, are referenced according to the requirements of the journal they were submitted to. Each of the chapters with published papers or papers under review include references, with an overall reference list completing the thesis.

In chapter two, an integrative literature review was undertaken to explore how communication technology has been used nationally and internationally to enable midwives and pregnant women/people to connect with one another. This paper is presented as a published paper.

Chapter three outlines the methodology and methods used in undertaking this PhD research. An overview is provided of the research design and underlying theoretical framework. Reference is made to the published papers in chapter four and chapter seven. Each of these chapters outline the methods used in each phase of the study.

Chapter four is a published paper which outlines the process for assessing the reliability and validity of questions for use in online surveys. The aim of this study was to assess reliability and validity of questions for two online surveys. A tool was created for use by an expert advisory group of midwives with experience in survey design and midwifery practice. The two online surveys formed phase one of this PhD research and consisted of both quantitative and qualitative questions.

Chapter five and six are published papers which report on the findings from the surveys with LMC midwives (chapter five) and pregnant women/people (chapter six). Each publication includes an introduction, aim of the study, methods, findings, discussion, and conclusion. Chapter five describes LMC midwives' experiences with using communication technology with pregnant people in their practice and identification of effective and ineffective communication technology practices. Chapter six describes the experiences of pregnant women/people with how they use communication technology when connecting with their midwife.

Chapter seven is a published paper. The aim of this paper is to highlight the experiences gained from using an online platform to conduct face-to-face interviews and the valuable contribution that online interviewing could offer as a valid research tool that differs to that of in-person face-to-face interviews.

Chapter eight consists of three papers with each paper reporting on a main theme from interviews conducted with LMC midwives in phase 2A. As a result, there is some repetition in the reporting of the way the research was conducted in the articles. This is due to the articles reporting on the same research methodology and methods. Two papers have been either published or accepted for publication with the third paper currently under review with the New Zealand College of Midwives Journal. Three themes were identified from the study: 1) enabling connection, 2) facilitating quality care, and 3) finding balance.

- Chapter 8.1 reports and discusses the findings from the first theme: enabling connection. (Paper under review)

- Chapter 8.2 reports and discusses the findings from the second theme on the contribution that communication technology makes towards quality care when used within a continuity of care relationship. (Paper accepted for publication).
- Chapter 8.3 reports on the findings from the third theme: 'finding balance'. Midwives identified the balance that is needed when using communication technology with the relationships they develop with their pregnant clients, with the protection of privacy and in creating a work/life balance. (Published paper).

Chapter nine is a paper under review with the New Zealand College of Midwives Journal. This chapter reports on the findings from online interviews conducted with pregnant women/people on what was important for them when using communication technology to connect with their midwife.

Chapter ten provides a final discussion of the overall findings and conclusion. This chapter outlines the contributions that this PhD research has made through the publications of findings from the two phases of study with LMC midwives and pregnant women/people and with the contribution to research methods. Limitations, recommendations, and areas for further research conclude this chapter.

Chapter 2

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

Chapter Overview

This chapter presents the findings from an integrative literature review and is presented as a published paper. The aim of the integrative review was to explore the literature on how communication technology has been used to enable midwives and pregnant women/people to connect with one another. Ethics approval related to the study was obtained and granted by the Auckland University of Technology Ethics Committee (AUTEC): 20/279 (See Appendix B).

The references are presented in this chapter as APA 7th edition, in keeping with a standardised formatting requirement for submission of the thesis through Auckland University of Technology. This is different to the published version (See Appendix H.1 for the journal PDF print copy). There were also some minor revisions to this chapter which were required by the examiners of the thesis which happened after publication of the paper.

Author contributions

This co-authored paper was the first publication submitted for this PhD research. The bibliographic details of this co-authored paper are:

Wakelin K., McAra-Couper J., Fleming T., Erlam, G. (2022). Exploring the ways communication technology is used by midwives and pregnant women/people: An integrative review. *New Zealand College of Midwives Journal* (58): 11–18. https://doi.org/10.12784/nzcomjnl58.2022.2.11-18.

My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), Dr Tania Fleming (Secondary Supervisor) and Dr Gwen Erlam (Assistant Supervisor) involved: preparing and submitting the ethics application, conceptualisation, formal analysis, investigation, and writing of the integrative literature review.

Signed:

Karen Wakelin Date: 7th May 2024

Countersigned: Date: 7th May 2024

Co-author and Principal Supervisor: Professor Judith McAra-Couper

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Introduction

Effective communication which is responsive to a person's needs and preferences has been identified by the World Health Organisation (WHO) as being one of five key categories for improving quality of care during childbirth (Bohren et al., 2017; World Health Organization, 2016). Communication practices that utilise digital technology such as short message service (SMS), emailing and instant messaging have been increasing 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 either synchronous (occurring at the same time) or asynchronous (a delay in the sending and 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 New Zealand where 91% of adults aged between 18-34 years own a smart phone (Research New Zealand, 2015), and in 2018, 89% of New Zealand's population were active internet users (Hughes, 2019). This compares similarly to smart phone use by adults in Australia and the United Kingdom (Granwal, 2021; O'Dea, 2021) and internet use (Keats, 2021; Statista Research Department, 2021). How communication technology is used by pregnant women/people and midwives is the focus for 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 or enabling access to health care (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; M. Willcox et al., 2019). Email and text messaging between health care organisations and consumers of health care services enabled efficient communication in the form of appointment reminders, 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, mobile and smart phones 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 accessing health care services may be limited, the flexibility and availability of mobile technologies such as mHealth or Telehealth programmes 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 New Zealand, a 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 New Zealanders (Ministry of Health, 2020b). This service enabled consumers to access the healthcare service they needed through either physical or virtual means via a range of communication channels.

Within the current global Covid pandemic, use of digital technologies such as video-calling have in some instances replaced the physical face-to-face assessment normally undertaken by midwives. In 2020, when Aotearoa New Zealand was engaged in a Covid-19 elimination strategy, midwives were encouraged to hold virtual appointments unless a face-to-face appointment was necessary, and where this was the case, to limit contact to no more than 15 minutes (Ministry of Health [MOH], 2020; New Zealand College of Midwives, [NZCOM] 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 women interrupting a conversation with their midwife to answer their phone (Dahl et al., 2017; Lewis et al., 2019).

Other concerns identified relate to the asynchronous nature of texting or instant messaging, with uncertainty around whether messages have been received and interpretation of messages (Häkkilä & Chatfield, 2005). Within Aotearoa New Zealand, communication practices where text messaging has been used between midwives and maternity consumers have led to complaints made to the New Zealand Health and Disability Commissioner. 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, inappropriate use of text messaging from a midwife to a woman, failing to document text messages within the clinical notes, and situations where the midwife had failed to appropriately advise women about the use of text messaging for urgent matters (Health and Disability Commissioner, 2013b, 2013a, 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 New Zealand, 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 when used within a healthcare environment and therefore in need of 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 a variety of research methodologies and is therefore useful when there is little known on a particular research topic (Snyder, 2019). This differs to 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/people to connect with one another.

Method

An integrative literature review of peer reviewed studies between 2010-2021 was undertaken to explore how communication technology 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 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 a PRISMA flow chart (figure 1). While a PRISMA flow chart is generally used when undertaking a systematic review, the flow chart is helpful in providing a visual representation of the integrative literature review process.

The initial search elicited 450 articles. The title of each of the publications was reviewed for their relevance. A search of title and abstract resulted in the removal of 431, leaving 19 relevant articles. Four duplicates were removed, and after reading the remaining 15 full publications, five studies were retrieved and assessed for relevance using a Critical Appraisals Skills Programme (CASP) checklist relevant to the appropriate study (CASP U.K, 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 U.K, n.d.). Each of the five studies met the requirements of the relevant checklist and so were included in the integrative literature review.

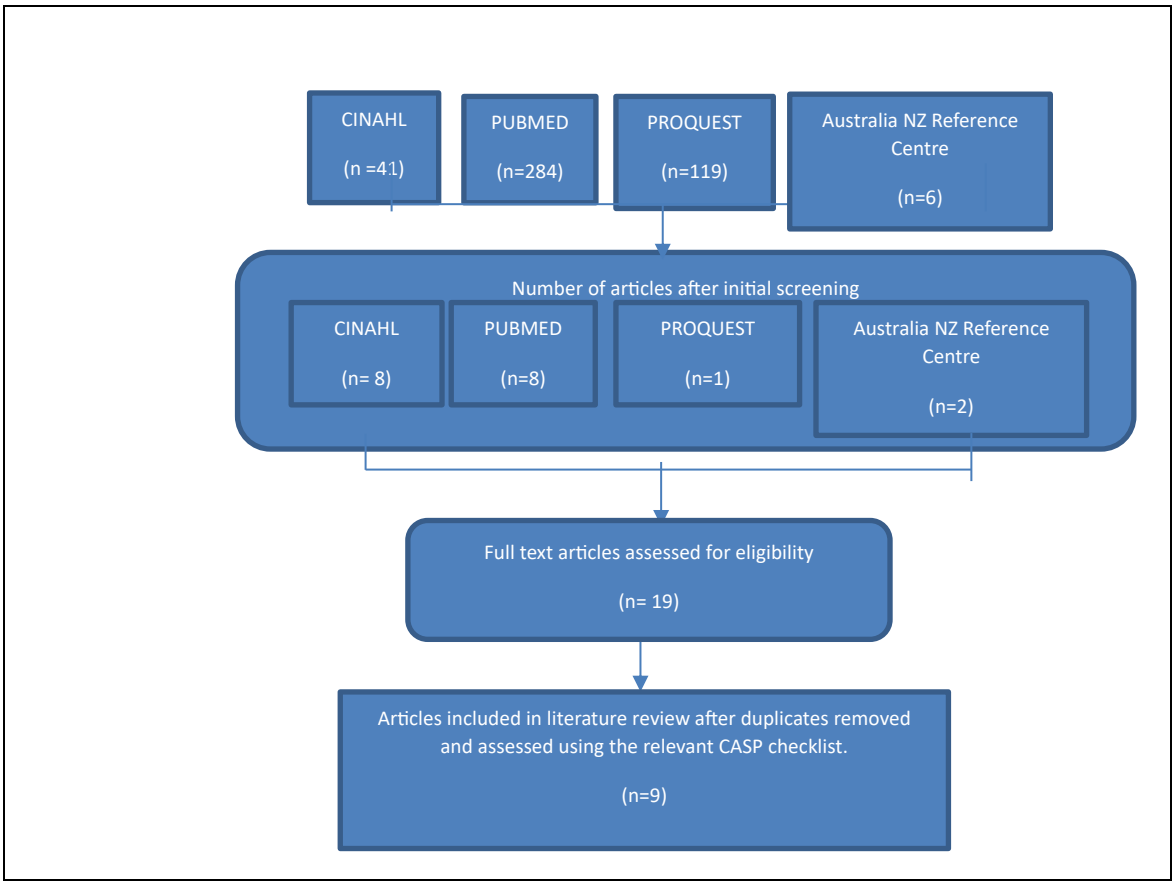
Criteria for inclusion in the review

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.

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



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 (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.

Results

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/study design/ method/sample/findings.

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), New Zealand (1), United States of America (1) and the United Kingdom (1).

A final column was used to highlight 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 health care services thereby reducing barriers to health care (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).

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.

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).

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 traveling 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 health care

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

Access to health care was enabled in two ways for pregnant women living in a rural location in Aotearoa New Zealand (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 health care 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 mis-used 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 (midwives) 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 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 overwhelming 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 for 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 it is '"the building of relationships' within the midwifery partnership which is nurtured by te kanohi kitea (the known face) which is important in the development of mutually respectful relationships" (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 health care 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 health care 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 vs 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 would therefore appear to provide a protective space for sensitive questions to be asked (Gleeson et al., 2019; M. Wallwiener et al., 2009).

While a lack of '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 on 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 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 (Gergen, 2002). 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, when 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 New Zealand which found that 50% of New Zealand 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 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 with how pregnant women/people and midwives are using and accessing the technology when communicating with each another. Many of the studies reviewed provided information from either the pregnant woman 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 United Kingdom. The only New Zealand 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 New Zealand. Firstly, in understanding how midwives and pregnant women/people use communication technology to communicate with each other and secondly, how communication technology is used within a midwifery continuity of care model.

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

This will be the focus for the first author's PhD research.

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Chapter 3

Methodology and methods

Introduction

This chapter outlines the research design for the study and the underlying theoretical framework. A mixed method multi-phase sequential transformative design was used to explore how communication technology is used by lead maternity carer (LMC) midwives and pregnant women/people to connect and how this contributes towards quality maternal and newborn care. Two questions informed the overall design of the study:

1. How does communication technology enable Lead Maternity Carer (LMC) midwives and pregnant women/people to connect and
2. How does communication technology contribute towards quality maternal and newborn care.

This multi-phase study was initially planned to be undertaken over three phases which would include collecting survey data from LMC midwives and pregnant women/people in phase one, interview data from LMC midwives and pregnant women/people in phase two and interview data from maternity stakeholders in phase three. However, a decision was made to reduce to two phases following discussion with my supervisors. The rationale for this decision was two-fold; 1) due to the large amount of data collected from phase one and two, which enabled the answering of the questions, and 2) to ensure the voices of LMC midwives and pregnant women/people were privileged. While interviews with maternity stakeholders are valid and important, they will inform part of important post-doctoral study. While there is reference in the published papers of three phases (K. Wakelin, McAra-Couper, & Fleming, 2023), this PhD thesis has been undertaken over two phases. Within each phase, part A reports on findings from LMC midwives while part B reports on findings from pregnant women/people. The Quality Maternal and Newborn Care (QMNC) framework will be discussed, and justification provided for using this framework within the study design. Specific details relating to the methods of each phase of the study are published as separate articles and appear in this thesis as chapters four and seven.

Why Mixed Methods

Mixed methods is considered to be the third major research approach, alongside those of quantitative and qualitative designs (Johnson et al., 2007). A Mixed methods approach uses a mixture of quantitative and qualitative methods and aims to consider the research question(s)

from differing points of view (Creswell & Plano Clark, 2011; Johnson et al., 2007; Morse, 2003; Teddlie & Tashakkori, 2009). The use of mixed methods for the research came about with the recognition that neither a quantitative nor qualitative approach would enable the question to be answered sufficiently on their own (Morse, 2003; Teddlie & Tashakkori, 2003; 2009). Morse (2003) comments that using more than one method within a research project, will enable a more complete picture of human behaviours and experiences. There is, however, a lack of consensus around a definition of mixed methods, and at what stage the combining or mixing of data occurs (Johnson et al., 2007)(J. W. Creswell, 2009; J. W. Creswell & Plano Clark, 2007; Guest, 2012; Shan, 2022). In attempting to simplify and create understanding of what is mixed methods, Guest (2012) suggests a change in focus is needed with identifying a 'point of interface' which *"refers to any point in a study where two or more data sets are mixed or connected in some way"* (p. 146). This is a move away from giving a classification to a particular mixed method research design such as *exploratory sequential design* or *conversion design* which he argues may not adequately describe the research design. In contrast, labelling or characterising the study, can provide context around what the study entails, and the steps involved, almost like signposting the design of the study. For this reason, the definition provided by Creswell and Plano Clark (2007) seems to fit with the approach to be taken for this PhD study.

> *"Mixed methods research is a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis and the mixture of qualitative and quantitative approaches in many phases of the research process. As a method, it focuses on collecting, analysing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches, in combination, provides a better understanding of research problems than either approach alone"* (Creswell & Plano Clark, 2007, p.5).

Pragmatism: philosophical assumption informing the research

The philosophical assumptions that are guiding the research process is one of pragmatism. Gray (2022) comments that mixed methods "*is not determined dogmatically according to a set of assumptions that flow from one paradigm or another, but flow from the nature of the research questions being asked in a way that offers the best chance of obtaining useful and workable answers*" (p. 210) and which are "*guided primarily by the researcher's desire to produce socially useful knowledge* (Feilzer, 2010, p. 6). My interest in conducting research to explore how communication technology is used between midwives and pregnant women/people comes from an interest in what this communication looks like in terms of

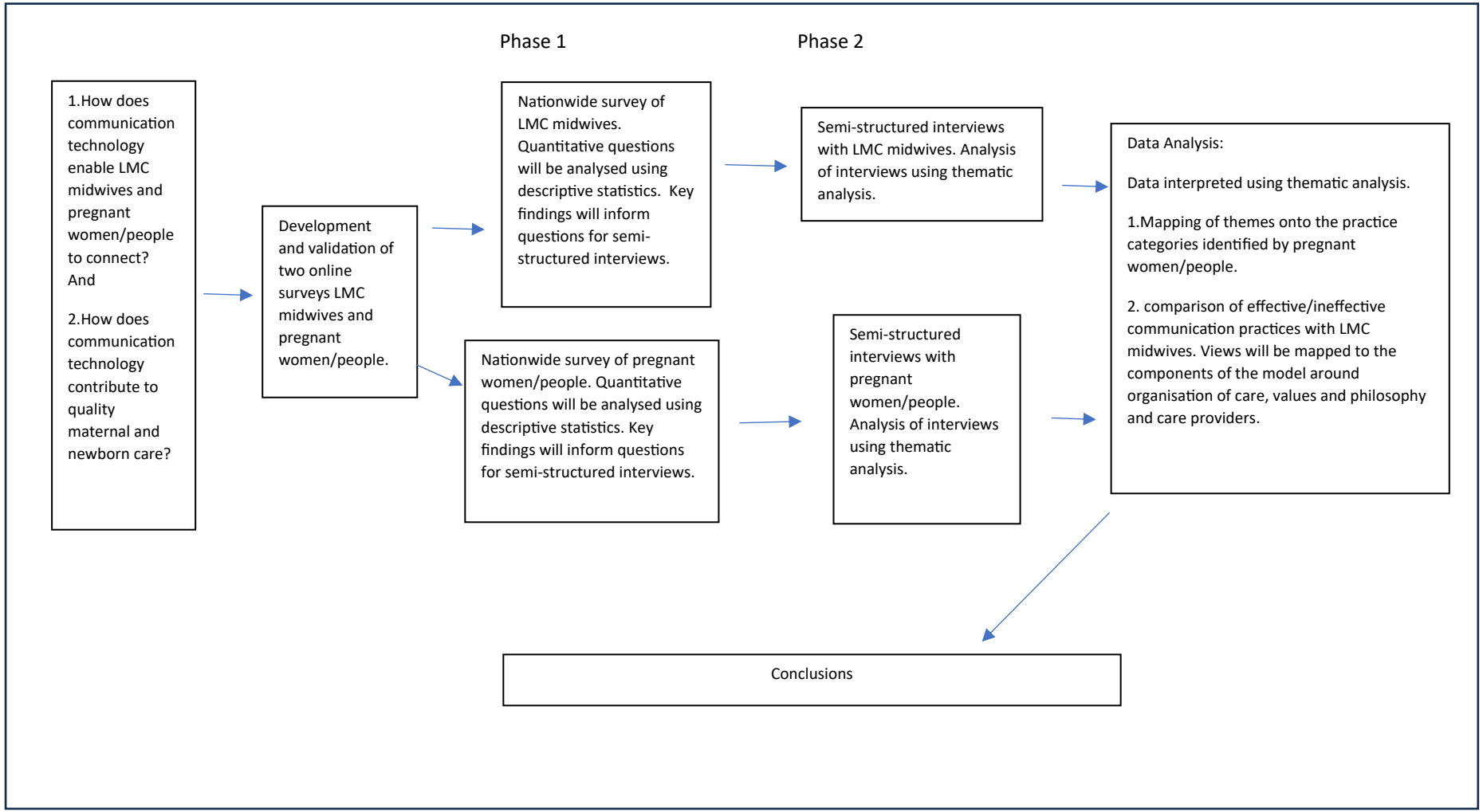
aspects of safety and care and how communicating in this way impacts on the relationship that is developed between the midwife and pregnant person. There is social relevance to this question, as communication technology is transforming the way people communicate with one another (Floridi, 2014). How this communication works within a health context may have quite different expectations and consequences to how this could be considered within a non-health and social environment.

While Sakata (2023) highlights a messiness to using mixed methods research with the combining and integrating quantitative and qualitative approaches, and where findings may both support and contradict each other within a single study, a pragmatic approach offers a flexible way of conducting the research, which can be adapted to work with the overall design (Haynes-Brown, 2023). A sequential design where each aspect of the study can be considered separately, and then drawn together as part of the overall discussion, offers flexibility with which to answer the research questions. This 'messiness' will be further contained through using the QMNC as a theoretical framework. A pragmatic approach informs each step of the research process. This begins with the choice to use a multi-phase sequential transformative design, to answer the research questions and will be explained further in the next section.

Mixed method multi-phase sequential transformative design

To understand what is meant by a mixed method multi-phase sequential transformative design, definitions are provided regarding each aspect of the design. A mixed-method multiphase design combines "*concurrent and/or sequential collection of quantitative and qualitative data sets over multiple phases of a programme of study"* (Creswell & Plano Clark, 2011, p. 73). For this PhD study, a mixture of methods was undertaken over two phases, using a sequential design. In a sequential design, the data collected from one phase is reliant on or informs the data collected from another phase (J. Creswell & Plano clark, 2018; Teddlie & Tashakkori, 2009). A sequential design is not necessarily determined by the first method used to collect data, and priority can be given to either the quantitative, qualitative or both phases (Tashakkori & Teddlie, 2003). In this study, the findings from data collected from the nationwide survey of LMC midwives and pregnant women/people in phase 1 A & B informed questions for the semi-structured interviews with LMC midwives and pregnant women/people in phase 2 A & B. The interviews enabled a deeper exploration of the themes or issues identified by the participants in the survey. One of the strengths of this design is that it is a straightforward way of conducting the research as each phase of the study can be reported on separately with a final discussion bringing results together (J. Creswell & Plano clark, 2018; Teddlie & Tashakkori, 2009). Figure 1 outlines the process taken for the multi-phase study.

Figure 1: Mixed-method research design model showing phases of data collection and analysis.



In a sequential transformative design, the quantitative and qualitative methods are guided by using a theoretical framework (Tashakkori & Teddlie, 2003). In this study the theoretical framework was the Quality Maternal and Newborn care framework as it seeks to give 'voice' to pregnant women/people and midwives through a transformative lens and an advocacy perspective. A transformative lens "ensures improvement in human interests and society through addressing issues of power and social relationships" (Sweetman et al., 2010, p. 441). Mertens (2003) describes a five-step process when using a transformative design which is involved in each aspect of the research design; 1) defining the problem and searching the literature, 2) identifying the research design, 3) identifying data sources and selecting participants, 4) identifying or constructing data collection instruments and methods and 5) analysing, interpreting, reporting, and using results. For this PhD research, the steps described by Mertens were undertaken throughout the research process and are outlined below.

Step One:

The first step in defining the problem and searching the literature involved an awareness first of the potential issues around the use of communication technology and how this might impact on the safety of care and relationships that midwives develop with their pregnant clients. An integrative literature review enables reviewing, analysing and comparing studies which use a variety of research methodologies to explore the problem (Snyder, 2019). In doing so, recognises the different ways of exploring an issue and would ensure a more rounded process than just using quantitative or qualitative methods on its own.

Step Two:

In step two, identifying the research design, the mixed methods multi-phase sequential transformative design enables the exploration of the research question through using the QMNC framework that is fundamentally concerned with empowering 'women' through identifying what is needed in a health context to ensure care is tailored to meet the needs of the person and quality care (Renfrew et al., 2014). The Quality Maternal and Newborn Care (QMNC) framework was developed by leading midwifery researchers who undertook a multi-methods study using qualitative systematic reviews to develop a framework to explore women's perspectives of maternity care and health providers perspectives on the effectiveness or ineffectiveness of practice delivery (Renfrew et al., 2014). Their framework sought to identify what it is that health systems need to ensure high quality care and how this care meets the needs of women and their babies. This framework therefore was an ideal choice to identify and explore how communication technology when used between midwives and pregnant women/people would contribute towards quality care (K. Wakelin, McAra-Couper, & Fleming, 2023; K. J. Wakelin et al., 2023). Further detail will be provided when discussing the theoretical framework used to inform the study later in this chapter.

Step Three:

In step three of Merten's process, the data sources are Lead maternity carer (LMC) midwives and pregnant women/people. Within Aotearoa New Zealand, the midwifery model of care is one of partnership based on continuity of care from early pregnancy, throughout the childbirth continuum until discharge around four - six weeks postpartum (New Zealand College of Midwives, 2015). Therefore, exploring how communication technology is used between midwives and pregnant women/people will give 'voice' from both perspectives.

Step Four:

In the fourth step of the transformative design process, phase one of the study involved an online survey to collect data from both midwives and pregnant women/people. To assess the reliability and validity of questions to be used in the surveys, a panel of midwifery experts with experience in both instrument design and midwifery practice was sought (and presented as a published paper in chapter four of the thesis) (K. Wakelin, McAra-Couper, Fleming, et al., 2023). This again is in keeping with a transformative design, where 'voice' is given to marginalised groups who haven't traditionally been used to validate tools. In phase two of the study, face-to-face interviews using an online platform to gather data from both midwives and pregnant women/people who took part in the online survey was sought to explore further any issues identified from phase one of the study. The description of the process involved in undertaking face-to-face online interviews in phase two of the study is presented as a published paper in chapter seven.

Step Five:

The fifth step identified by Mertens involves the analysing, interpreting, and reporting of results. The analysis and interpretation of the findings has been informed by the QMNC framework which is the theoretical framework guiding this PhD study and will be discussed in the next section. The QMNC framework is concerned with empowering and strengthening women (Renfrew et al., 2014). In taking an advocacy perspective which Sweetman et al. (2010) outlined above as 'improving human interests and society through addressing issues of power and social relationships', this PhD sought to do this by publishing the experiences of midwives and pregnant women/people throughout the research process. In this way, a PhD thesis with publication, honours the voices of the pregnant women/people and midwives. Further to this, in using the term pregnant women/people, also gives voice to those people who may not identify as 'woman'.

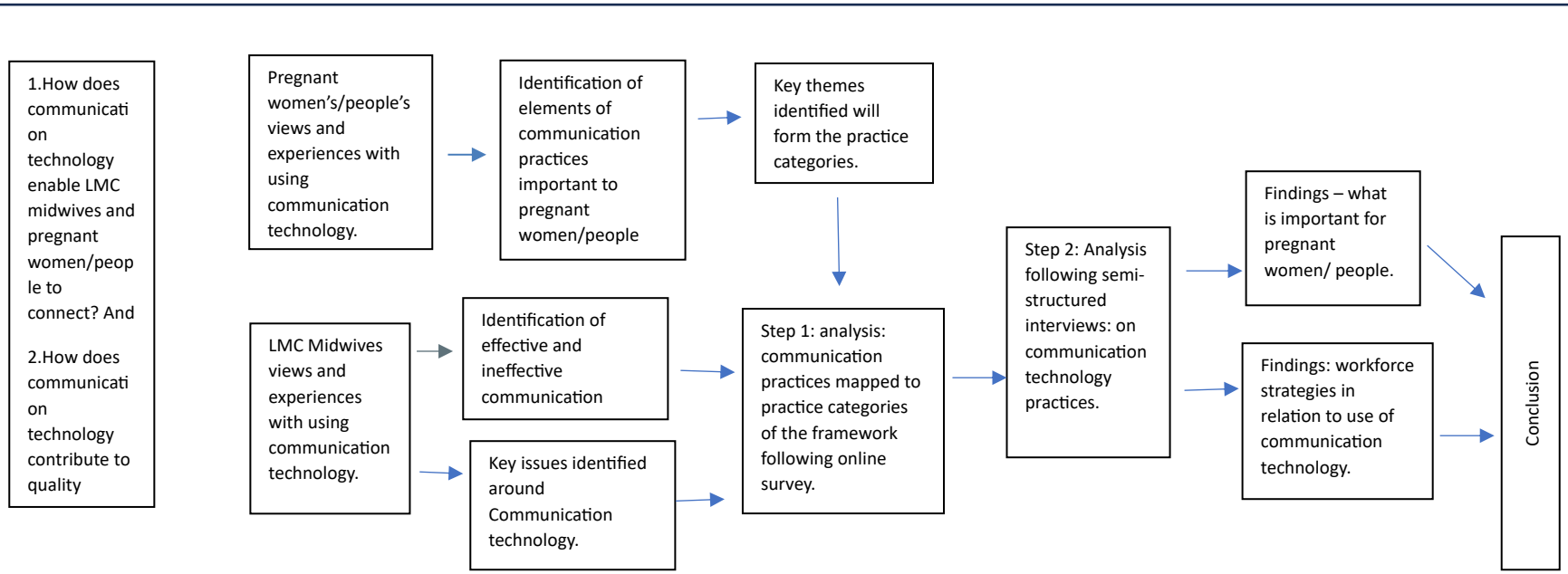
Theoretical framework to inform the study:

Quality Maternal and Newborn Care (QMNC) Framework

The QMNC framework is the theoretical framework guiding this multi-phase mixed methods sequential transformative design. The researchers used a multi-methods approach which incorporated synthesising findings from systematic reviews of women's perspectives and experiences of maternity care (Renfrew et al., 2014). Practices in maternal and new-born care were considered along with workforce groups providing aspects of maternity care. Five essential characteristics were developed to inform the QMNC framework which consisted of: (1) Identification of practice categories; (2) organisation of care; (3) values; (4) philosophy; and (5) characteristics of the care providers. Their findings showed that when this care was provided in a respectful and individualised manner, and tailored to meet the woman's needs, then women felt empowered and strengthened (Renfrew, et al., 2014). Care, which is individualised and tailored to the woman/person, aligns with the partnership model of continuity of care which is the philosophical underpinning of midwifery care in Aotearoa New Zealand (New Zealand College of Midwives, 2015). Using the QMNC framework, therefore, provides an opportunity to explore how communication technology is being used within a continuity of care model to determine what is working well, and to identify areas that need further strengthening. Using the QMNC framework in this way has similarly been used in other studies as reported on in the introduction section of the thesis (Cummins et al., 2019; Symon et al., 2018, 2019). Figure 2 outlines the components of care from the QMNC Framework that are used to inform the theoretical underpinnings of this PhD study.

Using the QMNC framework as a theoretical framework underpinning the research enabled exploration of how communication technology is used between LMC midwives and pregnant women/people. It will investigate how the technology has been used effectively in enabling pregnant women/people and midwives to connect, identify what challenges there are with using the technology and to then identify recommendations that can be made for future practice.

Figure 2. Adaption of the midwifery and quality care framework: (Renfrew et al, 2014).



Framework for quality maternal and newborn care: maternal and newborn health components of a health system needed by childbearing women/people and newborn infants.

Practice Categories	Elements of communication technology that are important to pregnant women/people
Organisation of care	How does communication technology enable access and connection?
Values	How does communication technology contribute towards respectful relationships.
Philosophy	Why do midwives / women choose to communicate in the way they do. Underlying beliefs around communication practices.
Care Providers	How are midwives combining clinical knowledge and skills with interpersonal and cultural competence when using communication technology?

Methods

The methods used in each of the two phases of the study are presented as published papers and will be outlined below as phase one and phase two. The recruitment of participants in each of the phases are provided as published papers for chapter five, six, and chapter eight point three, papers accepted for publication in chapter eight point two and papers under review in chapters eight point one and nine. Ethical approval was obtained and granted by the Auckland University of Technology Ethics Committee (AUTEC) on the 25th of September 2020: reference 20/279 (See Appendix B).

Phase one: online survey with LMC midwives and pregnant women/people

In chapter four, detail around the development and validation of a tool used for questions for the online surveys with LMC midwives and pregnant women/people are provided as a published paper (K. Wakelin, McAra-Couper, Fleming, et al., 2023). Further information is provided below around more specific details relating to phase one of the survey data collection process with LMC midwives and pregnant women/people.

Creation of the online surveys

The questions for the survey were created using an online Research Electronic Data Capture tool REDCAP (Harris et al., 2019). Information and help with creating the questions in the online format were sought from the Auckland University of Technology REDCAP administrator. Discussions with the administrator included formation of the different types of questions, inclusion of the participant information form at the beginning of the survey and the creation of a link at the end of the survey for LMC midwives and pregnant women/people. This last question asked participants if they would like to take part in a further interview as part of phase two of the study. If they selected 'yes', participants were taken to a separate question where they could provide their contact details. This additional question was not part of the survey and therefore their information could not be linked to their survey responses.

Recruitment

Permission to advertise on the closed Facebook groups was granted by the respective administrators of the Facebook sites. Recruitment of LMC midwives was advertised via closed midwifery Facebook pages in Aotearoa New Zealand (See Appendix C.1). Recruitment of pregnant women/people was advertised through closed pregnancy Facebook groups in Aotearoa New Zealand (See Appendix C.2).

Participant information form

A link on the advertised post on Facebook took participants to a participant information form at the start of the online survey.

- LMC midwives (See Appendix D.1)
- Pregnant women/people (See Appendix D.2)

Consent process for online surveys

Participants consented to take part in the online survey by clicking on a link advertised through a closed Facebook group, which took them to the participant information form and survey. An advantage with an online consent is that "*participants are less likely to feel pressure to enter into or remain in the study and are therefore more likely to enter and participate in the research freely*" (Eynon et al., 2017, p. 7). A statement was included at the start of the survey, that participants were consenting to take part by continuing with the survey.

Analysis of the data

A combination of structured and unstructured questions was used in the survey. Descriptive statistics were used to analyse the quantitative questions using the Statistical Package for Social Sciences (SPSS) for Windows version 27 while qualitative responses were analysed using a basic form of thematic analysis (Braun & Clarke, 2022). Help with interpreting the descriptive statistics was sought from the statistician at Auckland University of Technology. Further detail is provided in the published papers in chapters five and six (K. Wakelin et al., 2022; K. Wakelin, McAra-Couper, & Fleming, 2023).

Phase two: online face-to-face interviews with LMC midwives and pregnant women/people

In phase two of the study, face-to-face interviews were conducted via an online platform and presented as a published paper in chapter seven. As discussed in the methodology section, the questions for the interviews were informed by the findings from the online surveys conducted in phase one. The initial ethics approval had required an amendment to be submitted with an outline of the indicative questions to be used in the interviews. Ethical approval for this first amendment was granted by AUTEC on the 23rd of August 2022 (see Appendix B.1).

Recruitment

The LMC midwives and pregnant women/people who had taken part in the online survey and had indicated they were happy to be interviewed, were emailed by me to see if they were still

happy to be involved in the interviews. Fourteen midwives had agreed to participate, and this number was deemed adequate for the second phase. However, only two pregnant women/people had indicated they were happy to be interviewed. A further amendment was submitted to AUTEC for permission to recruit via Facebook and a third party (such as midwives). Further ethical approval from AUTEC was granted on the 15th of November 2022 for this phase of the study (see Appendix B.2). Recruitment for further participants took place via pregnancy Facebook sites (see Appendix E) and through a third party such as midwives (see Appendix E.1). Three pregnant women/people responded to the invitation to take part in an interview (giving a total of five participants). The difficulties with recruitment were discussed with my supervisors, and it was decided that five participants would be sufficient given the data already obtained through the survey in phase one.

Participant information form and consent process

Once participants had responded that they were happy to be interviewed, the following participation form and consent form were emailed to participants.

- Participation form for LMC midwives (see Appendix F.1)
- Participation form for pregnant women/people (see Appendix F.2)
- Consent form for LMC midwives and pregnant women/people (see Appendix G)

Further detail relating to participation and the consent process are outlined in the unpublished papers in chapters seven, eight and nine.

Analysis of the data

Analysis of the data was undertaken using thematic analysis as outlined in the six-phase process by Braun & Clarke (2022). Further detail outlining the analysis of data is provided in the unpublished papers in chapters eight, nine, ten and eleven.

Conclusion

A mixed method multi-phase sequential transformative design incorporates both quantitative and qualitative methods to be used to answer the questions. Using an evidenced informed quality maternal and newborn care framework, which has its underlying philosophy on strengthening women's capabilities, is an ideal framework to explore how communication technology is being used by LMC midwives and pregnant women/people within a continuity model of midwifery care. The QMNC framework has been used as an evaluation tool for use with focus groups and systematic reviews, however it has not been used with data collected from surveys or individual interviews. This PhD research therefore will contribute to the body

of knowledge around relationships developed between midwives and pregnant women/people and communication technology practices within midwifery. It will also contribute to further understanding how the QMNC model can be utilised as a theoretical framework for exploring midwifery research within a New Zealand midwifery continuity of care context. Along with this, a significant contribution is made to the methods used with undertaking research using online platforms. Further discussion around the methods used and their application within this PhD thesis are described in the following chapters.

Chapter 4: Methods

A process for assessing the reliability and validity of questions for use in online surveys

Chapter Overview

This chapter outlines the process taken in assessing and validating questions designed for use in two online surveys (phase 1 of the multi-phase study) and is presented as a published paper. The validation of questions was undertaken using a tool created for use by a panel of midwifery experts with experience in survey design and midwifery practice. Ethics approval related to the study was obtained and granted by the Auckland University of Technology Ethics Committee (AUTEC): 20/279 (See Appendix B).

The references are presented in this chapter as APA 7th edition, in keeping with a standardised formatting requirement for submission of the thesis through Auckland University of Technology. This is different to the published version (See Appendix H.2 for the journal PDF print copy). There were also some minor revisions to wording in this chapter which were required by the examiners of the thesis which happened after publication of the paper.

Author contributions

This co-authored paper was the second publication submitted for this PhD research. The bibliographic details of this co-authored paper are:

Wakelin, K., McAra-Couper, J., Fleming, T., & Erlam, G. (2023). A process for assessing the reliability and validity of questions for use in online surveys: Exploring how communication technology is used between Lead Maternity Carer midwives and pregnant people in Aotearoa New Zealand. *Methodological Innovations*, *January*, 1–11. https://doi.org/10.1177/20597991221148401%0A%0A

My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), Dr Tania Fleming (Secondary Supervisor) and Dr Gwen Erlam (Assistant Supervisor) involved: preparing and submitting the ethics application, conceptualisation, formal Analysis, investigation, and writing of the original paper.

Signed:

Karen Wakelin Date: 7th May 2024

Countersigned: Date: 7th May 2024

Co-author and Principal Supervisor: Professor Judith McAra-Couper

Countersigned: Date: 7th May 2024

Co-author of paper and Secondary Supervisor: Dr Tania Flemming

Countersigned: Date: 7th May 2024

Co-author and Assistant Supervisor: Dr Gwen Erlam

Introduction

The continuity of care model of midwifery practice within Aotearoa New Zealand (NZ) is unique. It is based on partnership which involves the midwife (known as a Lead Maternity Carer), the childbearing person and their family working together sharing knowledge, decision making and trust to enable the best outcomes for mother and baby (Guilliland & Pairman, 1994). This model of care within Aotearoa NZ came about with the passing of the Nurses Amendment Act 1990 which returned autonomy to midwives enabling them to practice in any setting whether it be home or hospital without medical supervision (Department of Health, 1990). Care is provided by the midwife from early pregnancy, during labour and birth through to six weeks postpartum following the birth of the baby (New Zealand College of Midwives, 2015) and is recognised internationally as providing one of the best systems of maternity care in the world (Ministry of Health, 2013). There were 58659 live births registered in Aotearoa NZ in 2021 (Stats NZ|Tatauranga Aotearoa, 2022), with 93% of childbearing people receiving care from a Lead Maternity Carer midwife (LMC) (Ministry of Health|Manatū Hauora, 2022). Midwives as LMC's make up 38% of the midwifery workforce in Aotearoa NZ (Midwifery Council |Te Tatau o te Whare Kahu, 2022).

There is growing use of communication technology, in Aotearoa NZ. Ninety one percent of adults aged between 18-34 years own a smart phone (Research New Zealand, 2015) and 89% were active internet users (Hughes, 2019). More often childbearing people are connecting with their midwife through using communication technology during their pregnancy. What is unknown however, is how this technology is being used between midwives and pregnant people to ensure quality maternal and newborn care within a continuity model of midwifery care.

Surveys offer an opportunity to gather information on attitudes, beliefs, opinions, behaviours, and characteristics of an area of interest and therefore are ideal to use when little is known of a phenomenon (Borbasi & Jackson, 2016; Safdar et al., 2016). There are many problems identified with instrument design such as questions which are poorly worded or vague, long, or with inappropriate response options (Sue & Ritter, 2007; Sullivan & Artino, 2017). Using an expert panel of reviewers with expertise in a particular topic area is one way to evaluate the reliability and validity of an instrument design (Davis, 1992; Lynn, 1986). Reliability refers to the consistency of survey responses over time, while validity refers to the extent to which the measurements of the survey provide the information needed to meet the study's purpose (Tavakol & Dennick, 2011). While using a tool for validating question design within midwifery are not new (Jenkinson et al., 2021; Milne et al., 2016) it's application within a midwifery continuity of care context, whilst aligning questions to an internationally recognised evidenced

informed Quality Maternal and Newborn Care (QMNC) framework developed by leading global midwifery researchers (Renfrew et al., 2014) is less well known. The QMNC framework focuses on strengthening people's capabilities and ensuring care is tailored to meet their needs. It does this through identifying what is needed within a healthcare system to provide high quality care (Renfrew et al., 2014). Communication technology is widely used throughout Aotearoa (Hughes, 2019; Research New Zealand, 2015), and communication is an important aspect of the midwife/pregnant person relationship within a continuity model of midwifery care (Midwifery Council |Te Tatau o te Whare Kahu, n.d.-a). Identifying what aspects of communication technology are working well and how or what communication technology services need improving upon will be important to ensure services are meeting the needs of the pregnant person. Using an expert advisory group (EAG) of midwives with expertise in survey design and midwifery knowledge adds to the building of scholarship within the midwifery research community. It does this by situating the survey designed by midwives for midwives and pregnant people within a midwifery body of expertise and knowledge. Content Validity Index and Cronbach's Alpha Coefficient provide a reliable way to critique the validity and reliability of the question design for use in online surveys with LMC midwives and pregnant people in Aotearoa New Zealand. This is validated further by qualitative comments provided by the EAG, to give robustness and certainty to the two survey instruments. The purpose of this paper is to discuss an innovative approach for assessing the reliability and validity of questions for use in online surveys and the contribution this makes to instrument validation within a midwifery context. It does this through asking midwifery experts, to use a tool alongside their review of questions for two online surveys.

Aim:

To assess reliability and validity of questions designed for use in two online surveys to explore how communication technology is used between LMC midwives and pregnant women/people in Aotearoa New Zealand. The validation of questions was undertaken using a tool created specifically for use by a panel of midwifery experts with experience in survey design and midwifery practice. Analysis of the tool using Content validity Index (CVI), Cronbach's alpha coefficient (CAC) and comments by the expert midwifery group are used to ensure the survey instruments are both valid and reliable.

Method:

Innovative method for validating surveys

An innovative approach taken to validating the two online surveys is demonstrated by adding qualitative rigour to what would otherwise be considered a quantitative approach. In so doing, "*recognises the patriarchal and colonial roots of knowledge production and dissemination"*

(Newnham & Rothman, 2022, p. 178) which is otherwise associated with quantitative survey designs. This is achieved through using an expert advisory group of midwives with experience in survey design and midwifery practice to rate questions used in a survey, along with providing comments to support their scoring. This gives voice to the expertise of midwifery knowledge and builds a community of scholarship within the midwifery domain, to inform midwifery research. The questions for the survey have been specifically designed by midwives, for midwives and pregnant people in Aotearoa NZ within the context of an internationally respected model of midwifery care. These questions were then validated by midwives using a tool to provide a level of expertise and rigour that would otherwise not be possible to achieve. Questions designed for midwives and pregnant people are aligned with a midwifery evidenced informed quality maternal and newborn care framework which was developed by midwifery researchers, and is the first such midwifery framework to be published in the Lancet journal (Renfrew et al., 2014). The development and validation of the survey questions are outlined below.

Development and validation of the survey questions

The development and validation of the two online surveys was carried out using a two-stage process. (1) questions were developed from findings of an integrative literature review, mapped with the Quality Maternal and Newborn Care (QMNC) framework (Renfrew et al., 2014) and (2) a tool was developed for use with validating questions by an expert advisory group (EAG) of midwifery academics and analysed using Content validity index (CVI), Cronbach's alpha coefficient (CAC) and review of comments made by the EAG. Content validity is the extent to which a study establishes a trustworthy cause and effect relationship between a treatment and an outcome (Pallant, 2016). It asks the question, "Does it accurately measure what you want it to?" Cronbach's alpha tests the reliability of the instrument asking the question, "Does it return the same or similar results each time it is used?" The higher the Cronbach's alpha, the greater the internal consistency (reliability) of the instrument (Pallant, 2016). A Cronbach's alpha of greater than 0.8 is preferable.

Stage one: development of survey questions

In stage one, development of questions for the two online surveys were informed from findings of an integrative literature review conducted in preparation for the study (K. Wakelin et al., 2022) and then mapped with the QMNC framework (Table 1). The QMNC framework was selected specifically as it was developed by midwifery researchers for use within a maternity setting and offers an opportunity to explore how LMC midwives and pregnant people are using communication technology when communicating with one another within a continuity model

of midwifery care. Questions were designed to sit within each of the four categories of the QMNC framework; organisation of care; values; philosophy; and care providers.

Organisation of care:

The themes from the integrative literature review were mapped across the 'organisation of care' category related to 'connecting' and 'access to health care.' Questions around location of care and access to care were addressed.

Values:

Questions were designed to focus on how communication technology had been tailored to meet the pregnant person's needs, and how satisfied midwives and pregnant people were with the way they each responded to one another using the various communication technology platforms.

Philosophy:

To highlight the importance of communication and connection, the questions sought to investigate how communication technology is used to promote health and wellness for pregnant people. Relevant themes from the integrative review include connecting, privacy and confidentiality.

Care providers:

The category 'care providers' is concerned with how practitioners combine clinical knowledge and skills with interpersonal and cultural competence. Questions were designed to explore measures that midwives and pregnant people would take to ensure they had the necessary skills and knowledge when using communication technology. The findings from the integrative literature review identified both midwives and pregnant women lacked skills when using communication technology and had concerns around privacy and confidentiality.

Table 1: Mapping of questions to the categories on the QMNC Framework

		Themes from integrative literature review	Rationale for question
Practice Categories	*Elements of communication technology that are important to women*	• Access to health care	
Organisation of care	*Organisation of care within the QMNC framework focuses on the availability and access of acceptable good quality services and adequate resources.* For midwives, question design related to location of midwifery practice, how midwives provide care; whether this is continuity or shared care arrangements and where antenatal assessments usually take place. For pregnant people: questions asked about usual place of residence, access to communication technology e.g. internet, mobile phone	• Connecting • Access to health care	LMC midwives provide care to women in both urban and rural settings throughout New Zealand, with some providing continuity of care while others are working in shared care arrangements with other midwives or health professionals. Access to internet or Wi-Fi services may be problematic and may impact on how midwives and women connect and communicate with one another.
Values	*Values within the framework focus on how care has been tailored to meet women's circumstances and needs.* Question design related to how communication practices are tailored to meet the pregnant person's needs. The questions for midwives asked how they use communication technology to undertake assessments and whether they were able to connect with the pregnant person in a satisfactory way. E.g: Please indicate which communication technologies you ask pregnant people to use when contacting you for urgent or non-urgent communications or changing planned appointments? The questions for pregnant people asked how satisfied they were when their midwife uses different technology options to contact them.	• Connecting	Trust is an important value within relationships. How use of communication technology enables trusting relationships to be maintained between LMC midwives and pregnant people will be explored.

	Where do antenatal appointments with your midwife usually take place?		
Philosophy	*The QMNC Framework focused on how optimising biological, psychological, social and cultural processes strengthened women's capabilities.* Survey questions focus on whether the use of communication technology is negotiated and whether communication technology is used to promote health and wellness for pregnant women/people. Questions for pregnant people asked questions relating to face to face or online interactions. Which technologies pregnant people use to obtain information regarding their pregnancy.	• Connecting, • Privacy and confidentiality	The underlying philosophy of New Zealand midwifery is that midwifery care is undertaken in partnership and actively promotes and protects wellness and health awareness of the woman, her whanau and baby (New Zealand College of Midwives, 2015).
Care Providers	*This aspect of the QMNC Framework focused on practitioners who combined clinical knowledge and skills with interpersonal and cultural competence. The authors looked at the division of roles and responsibilities based on need, competencies and resources*. Questions focus on exploring the measures midwives (and pregnant people) take to ensure they have the skills and knowledge around using different communication platforms to connect with one another. Questions addressed the comfort level of LMC midwives and pregnant people with using technology. Eg for both midwives and pregnant women/people: do you use any privacy protection software on your communication device(s)? Pregnant women/people: Eg: Do you have any concerns about your privacy when using technology to connect with your midwife? For midwives: Eg: How do you normally record or document	• Skills and knowledge, • Privacy and confidentiality	The Midwifery Council of New Zealand sets down competencies for practice which all midwives in Aotearoa New Zealand must adhere to. There are other regulatory bodies such as the Health and Disability Commission which outline the consumers code of rights when receiving / accessing health care.

	face to face assessments and care planning with pregnant people? How do you normally record or document other non-face-to-face communication episodes with pregnant women/people?		

Stage two: validation of questions for use in the two online surveys:

A tool for validating questions is recommended to assess whether the development of survey instruments are both valid and reliable (Tavakol & Dennick, 2011). Content validity refers to how well an instrument measures the construct under study (Zamanzadeh et al., 2014). The validity of the instruments is discussed using the content validity index (CVI). Polit et al., (2007) discuss the use of a CVI for individual items as well as the content validity of an overall scale. Experts are asked to rate each item using a rating scale to enable reviewers to assess each item separately (Davis, 1992). This is achieved through scoring obtained from each item within an instrument and can be used to evaluate the clarity of the question used in a survey instrument (Polit & Beck, 2006).

Reliability of a survey instrument refers to the consistency of measurement and whether the items of the scale are all measuring the same underlying construct (Pallant, 2016). Reliability of the two survey instruments is discussed using Cronbach's alpha coefficient (CAC). Cronbach's alpha coefficient is commonly reported on 'as an indicator of instrument or scale reliability or internal consistency'(Taber, 2018, p. 1284) and provides 'a measure of the internal consistency of a scale and is expressed as a number between 0 and 1' (Tavakol & Dennick, 2011, p. 53).

Once the questions for the survey were developed, the tool for validating questions was created and emailed to an expert advisory group (EAG) consisting of seven midwifery academic research colleagues with experience in both quantitative and qualitative research designs, and midwifery practise. An EAG consisting of between three to ten reviewers is considered reasonable when reviewing a survey instrument (Lynn, 1986). Davis (1992) suggest using experts with experience in instrument construction techniques or with experience in a particular topic area as this 'maximises the likelihood of having an instrument that is both well-constructed and content-valid" (p. 194).

When deciding on what questions to retain in a survey, there seems to be some agreement to retain questions if reviewers reach agreement on questions rated as quite relevant or highly relevant (Davis, 1992; Lynn, 1986). For this tool, strongly agree – agree was used as an indication for retaining questions (De Castellarnau, 2018). A 4-point rating scale ranging from strongly agree to strongly disagree was used by the EAG to evaluate the level of agreement or disagreement

with each of the survey questions. For the two instruments, reviewers from the EAG were provided with a tool for validating questions and asked to score each question based on three categories or items: (1) appropriateness of question; (2) relevance of question; and (3) question stated clearly (Table 2). In determining whether the question was appropriate, relevant, or stated clearly, scoring is based on whether reviewers 'agree' or 'strongly agree' with each item.

There are two ways of calculating the CVI score – one method which relies on universal agreement for each item between reviewers and the second, relying on an average item score (D. F. Polit & Beck, 2006). For the purposes of this tool an average item score was used alongside review of comments from the EAG. Addressing the validity of the question was undertaken in three ways. 1. an individual item score (i-CVI) was calculated by counting the number of reviewers who agreed/strongly agreed with each individual item and then divide the score by the number of reviewers, 2. a question score (q-CVI) was calculated by adding up the three individual item CVI scores for each question and dividing by three (this then gives an overall score for the validity of the question) and 3. an overall scale score (s-CVI) was calculated by adding up each of the overall q-CVI scores and dividing by the number of questions. This gave an overall instrument score. Polit & Beck (2006) comment that different approaches can lead to different values and therefore not always easy to calculate. To continue with the innovation of the method, a column for comments was added to the tool which would enable the EAG to provide feedback or comments on the wording of the question (Table 2). DeVellis (2017) recommend experts review the survey to rate the relevance of each question, to evaluate the clarity and conciseness of the questions and to provide further comments on other options that may have been missed. Using midwifery expert knowledge in this way, contributes to the validation of the survey instruments by giving a voice to midwives, and ensures questions are relevant and appropriate.

Table 2: Tool used by expert advisory group for validating survey questions

Item	Strongly Agree	Agree	Disagree	Strongly Disagree	Comment
Appropriateness of the question for the category it is classified in.					
Relevance of question for assessing use of communication technology					
Question stated clearly					

An individual item (i-CVI) score of 0.78 and above with six or more reviewers is considered acceptable (Davis, 1992; Lynn, 1986) while an overall scale (s-CVI) score of ≥0.9 is considered

acceptable (D. F. Polit & Beck, 2006). For this reason, any questions scoring below 0.78 for the i-CVI or 0.9 for the q-CVI and s-CVI have been highlighted in tables three and four.

The responses from the EAG were initially recorded into Excel and then transposed into SPSS version 27, for analysis. The initial plan to assess reliability was to use Cronbach's coefficient alpha (CAC) which would provide an indication of the average correlation among the items scale (Pallant, 2016). When CAC was applied to the survey for LMC midwives and pregnant people respectfully, the scoring was more difficult to interpret possibly due to only having three items per question. Pallant (2016) suggests less than 10 items in a scale can result in low scoring. In view of this, using CVI in conjunction with CAC and comments from the EAG would provide a better overall analysis of results.

Results:

The EAG were asked to review 22 questions from the survey developed for LMC midwives (Table 3) and 13 questions for the survey developed for pregnant people (Table 4). For each question, the EAG were asked to evaluate the question based on (1) the appropriateness of the category it was classified in, (2) the relevance of the question and (3) whether the question was stated clearly.

The survey developed for LMC midwives included 22 questions, with three items per question giving a total of 66 items. Seven items (i-CVI) from a total of 66 scored under the acceptable score of 0.78. The overall question (q-CVI) score for each question reached the acceptable level of ≥ 0.9 for all but three questions where the range in scores were 0.76-0.85. The overall scale (s-CVI) score for all 66 items was 0.92. When Cronbach's alpha coefficient was applied to the whole survey (66 items), an overall score of 0.78 was achieved.

The survey developed for pregnant people included 13 questions, with three items per question giving a total of 39 items. An item (i-CVI) score was given for each item, along with an overall question (q-CVI) score for each question. Only two items from a total of 39 items scored under the accepted score of 0.78. The overall q-CVI score for each of the questions reached the acceptable level of ≥ 0.9 except for two questions, where a score of 0.85 was achieved. The overall scale (s-CVI) score for all 39 items was 0.938. When CAC was applied to the whole survey (39 items), an overall score of 0.83 was achieved. While Pallant (2016) suggests a score of 0.7 or above will provide reliability and validation for a question, due to the small number of items per question being measured, the accuracy is less clear.

Where scoring on CVI and CAC did not reach acceptable levels, comments and suggestions on wording made by the EAG enabled the question to be either reworded or removed altogether. For example, a question asked of pregnant people:

"Have you sent pregnancy related photos to your midwife during your pregnancy?"

This required a yes or no response. If 'yes' was indicated, a following question would ask "*how did your midwife respond*", with options provided such as 'via text, phone call or not at all'. Following feedback from the EAG, it was decided to include a text box within the survey as this would enable participants to provide information if they had sent more than one pregnancy related photo.

Similarly, an initial question in the survey for midwives would require a yes or no response:

"Do you use any privacy protection software on your communication devices?"

Following feedback and suggestions from the EAG, if 'yes' was indicated, participants would have an option to indicate in a text box any privacy protection measures that they used.

Discussion

Using a tool to validate questions for use in two online surveys by an expert advisory group of midwives was a first step in a larger mixed methods multiphase study which seeks to explore how communication technology is used between LMC midwives and pregnant women/people in Aotearoa New Zealand.

Polit and Beck (2006) discuss two concepts behind the development and validation of instruments; (1) the developer has conceptualised and analysed the items to be used in the instrument and (2) the evaluation of the relevance of the instrument using an expert panel. The conceptualisation of the two survey instruments were informed by findings from an integrative literature review undertaken as part of the multi-phase study (K. Wakelin et al., 2022) and then mapped against the midwifery evidence-informed Quality Maternal and Newborn Care framework (Renfrew et al., 2014). The evaluation of the two instruments were analysed using Content Validity Index (CVI) and Cronbach's Alpha Coefficient (CAC) scoring, alongside comments from the EAG. Using content validity index scoring to rate individual item scores (i-CVI) and overall question scores (q-CVI) provided an opportunity to review and revise the few questions which did not achieve the acceptable validity score. These questions required minor tweaking or removal and were considered alongside comments and suggestions from the EAG. The overall scale CVI score (s-CVI) for both instruments achieved the acceptable level of ≥ 0.9 (Polit & Beck, 2006) giving confidence that overall, the instrument design was valid.

Interpreting results using CAC was challenging given, there were several items where the overall reliability score was 0. Difficulty in interpreting results using CAC has been reported when small numbers of items are used (Pallant, 2016; Taber, 2018). Each question had only three items which may explain the inaccuracies when analysing results using CAC. Taber (2018) suggests for this reason it is sometimes used alongside other tools as was done in this case, with using CVI. Calculating the CVI score was straightforward, doesn't require statistical knowledge, and therefore adds to the ease of interpreting results. Used alongside comments from the EAG of midwives, provided an additional layer in which to consider each question, and therefore added to the validity and reliability of the two survey instruments.

A challenge in the development of questions was around whether to include questions on Covid 19. While the analysis of the survey questions based on scoring from CVI and CAC would suggest the two surveys were valid and reliable, consideration was also given to comments made by the EAG. For example, there were initially a series of questions related to Covid-19.

> For LMC midwives*: "Were you affected by the Covid-19 alert level 3 lockdown?" and "Has the way you communicate with antenatal clients changed as a result of Covid-19?"*
>
> For pregnant people: *"Were you affected by the Covid-19 alert level 3 lockdown? Has the way you communicated with your midwife changed as a result of Covid-19? How challenging was it to use communication technology when connecting with your midwife during Covid-19?"*

The comments and suggestions made by the EAG, were that these questions could lead to confusion given that at the time the survey instrument was constructed, New Zealand was not currently in a lockdown and therefore the questions may not be relevant.

Another question asked under the heading of Covid 19 was "how concerned are you that use of communication technology will lead to complaints?" The i-CVI score was lower than 0.78 on both the appropriateness of the question and the clarity of the question. The q-CVI for the question also scored lower than 0.9. The EAG were able to make suggestions for either rewording or removing the question altogether. As a result of this feedback, the sub heading of Covid 19 was removed and instead the question was reworded to "How concerned are you that using communication technology with pregnant people may lead to complaints to Midwifery Council?"

Taking into consideration comments from the EAG provided greater insight into the scoring and was an important step in the design of the two online survey questions. Polit et al., (2007) suggests qualitative feedback can be indicative of content capability and commitment to the project. We would argue it is more than this. Increasingly looking to expertise within professions who haven't traditionally been used to validate tools, establishes a scholarly body of knowledge for those professions. The development of this tool was innovative in its approach of seeking the

midwifery voice to validate tools and thus begin a scholarly body of knowledge. In this instance, an EAG of New Zealand midwives were reviewing questions for two online surveys designed by New Zealand midwives for use within a New Zealand midwifery continuity model of care using a QMNC framework, developed by leading midwifery researchers. The validation of the tool using Content validity index and Cronbach's alpha coefficient scoring was further validated by comments from midwifery experts in survey question design and midwifery practice. This in effect, provided an extra layer in the validation of survey instruments. It also builds a community of scholarship within midwifery (Newnham & Rothman, 2022). A similar approach was taken by Milne et al, (2016) in using cultural Indigenous experts in the development and validation of questions for an online survey which sought to measure nursing and midwifery academics' awareness of cultural safety. This approach is equally applicable to other smaller allied health professions who seek to establish a scholarly body of knowledge within their respective professions. Newnham and Rothman (2022) argue that the quantification of midwifery research is limiting midwifery knowledge, and therefore research methods which seek to give voice, and hold space for qualitative expertise is for the betterment of the profession. The feedback from the EAG enabled validation of the survey questions and provided a level of reliability and certainty that the questions would elicit appropriate responses. As the overall scoring of the survey instruments were considered within an acceptable range for validity and reliability, revalidation of the survey instruments was not sought from the expert advisory group.

Limitations:

Analysis of results using CAC were at times difficult to interpret due to small numbers of items within each question. It was not possible to seek feedback from pregnant people with the survey design, however the EAG were able to offer constructive feedback with their expert midwifery knowledge and experience of survey instrument design. A further limitation is acknowledged in not seeking further validation from the EAG once changes to wording of questions were undertaken. This information could have provided further validation and reliability of items which hadn't initially met the acceptable scoring range.

Conclusion

Creating a tool for validating questions developed by midwives for an expert group of midwives recognises and values the knowledge and expertise from this professional group, and gives voice to midwifery, which traditionally has been marginalised by more patriarchal research paradigms. The findings from the EAG were analysed using Content Validity Index and Cronbach's alpha

coefficient scoring. This provided validation that the questions were appropriate, relevant, and stated clearly. Further validation was provided by comments and feedback from the EAG of midwives which added an extra layer of confidence with tweaking the final rendition of the two online surveys. This provided the assurance needed to move to the data collection phase of the study to explore how communication technology is used between LMC midwives and pregnant people in Aotearoa New Zealand.

Table 3: LMC midwife validation survey on a 22 question/66 item rating scale by seven experts: items rated as agree or strongly agree

Adapted Categories from QMNC Framework	Themes from integrative literature review	Questions from MW survey matched to categories from framework	Item	Number of experts who agree/strongly agree (n=7)	Item CVI (i-CVI)	Overall CVI for question (q-CVI)	Cronbach's Alpha
Organisation of care: *The focus is on the availability and access of acceptable good quality services and adequate resources.*	• Connecting • Access to health care	Please indicate whether your main area of practice is: urban, rural, semi-rural, remote rural	Appropriateness of question	7	1.00	0.95	0.5 (negative covariance)
			Relevance of question	6	0.85		
			Question stated clearly	7	1.00		
		Please indicate whether you provide: continuity of midwifery care (antenatal, labour & birth and postnatal care), shared care arrangement with other midwives, GP or obstetrician. If you provide shared care, please indicate whether you provide: antenatal care only, labour and birth care only, postnatal care only, antenatal and postnatal care	Appropriateness of question	7	1.00	0.90	0.75
			Relevance of question	6	0.85		
			Question stated clearly	6	0.85		
		Where do assessments with antenatal clients usually take place?	Appropriateness of question	7	1.00	0.90	0.83
			Relevance of question	6	0.85		
			Question stated clearly	6	0.85		
		In your area of practice, how would you describe your access to the following: internet, connection, cell phone signal, landline connection ○ Excellent ○ Good ○ Poor ○ Do not have access	Appropriateness of question	7	1.00	0.95	0.89
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		How difficult is it to communicate with antenatal clients where Wi-Fi access is problematic? (Please rate on a scale from 1-5 where 1 is not difficult and 5 is very difficult).	Appropriateness of question	6	0.85	0.85	0.67
			Relevance of question	7	1.00		
			Question stated clearly	5	0.71		
Care Providers: *Questions focus on identifying the measures*	• Skills & knowledge • Privacy and confidentiality	How would you rate yourself when using the following communication technology? ○ Novice	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		

midwives took to ensure they had the skills and knowledge for using the various communication platforms.	• Access to health care	○ Intermediate ○ Expert					
		If you needed to upskill yourself, how would you go about doing this?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		When receiving a text message from antenatal women/people, how would you rate your level of concern with regard to: ○ Sending and receiving text messages ○ Privacy and confidentiality of text messages ○ Interpreting text messages	Appropriateness of question	7	1.00	0.90	0
			Relevance of question	7	1.00		
			Question stated clearly	5	0.71		
		How do you normally record or document face to face assessments and care planning with antenatal clients?	Appropriateness of question	7	1.00	0.95	0.83
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		How do you normally record or document other communication episodes with antenatal clients?	Appropriateness of question	7	1.00	0.95	0.83
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
Values: *Values within the framework focus on how communication practices have been tailored to meet the pregnant person's needs.*	• Connecting • Access to health care	Please indicate how frequently (within the last two weeks) you used the following technology when contacting antenatal clients in your practice (please tick all that apply)	Appropriateness of question	7	1.00	0.90	0
			Relevance of question	6	0.85		
			Question stated clearly	6	0.85		
		From your responses to the question above, please indicate how satisfied you were with using communication technology when communicating with pregnant women/people.	Appropriateness of question	7	1.00	0.90	0
			Relevance of question	7	1.00		
			Question stated clearly	5	0.71		
		What are the main forms of communication technologies that pregnant women/people use when contacting you?	Appropriateness of question	7	1.00	1.00	0
			Relevance of question	7	1.00		
			Question stated clearly	7	1.00		
		Have antenatal women/people ever sent you pregnancy related photos during their pregnancy?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		Have antenatal women/people ever sent you pregnancy related video clips during their pregnancy?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
			Appropriateness of question	7	1.00	1.00	0

		Have you undertaken assessments with antenatal clients using video technology?	Relevance of question	7	1.00		
			Question stated clearly	7	1.00		
Philosophy: *Questions focus on how the use of communication technology is negotiated and used to promote health and wellness for pregnant women/people*	• Connecting • Privacy and confidentiality	Please indicate which communication technologies you ask women to use when contacting you for urgent or non-urgent communications or changing appointments:	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		Do you consider communication technologies have positively influenced the way you communicate with antenatal women/people?	Appropriateness of question	7	1.00	1.00	0
			Relevance of question	7	1.00		
			Question stated clearly	7	1.00		
		Were you affected by the Covid-19 alert level 3 lockdown?	Appropriateness of question	6	0.85	0.76	0.83
			Relevance of question	6	0.85		
			Question stated clearly	4	0.57		
		When connecting face to face with antenatal clients, was there a preference for: Face to face in person or face to face via video link?	Appropriateness of question	6	0.85	0.80	0.86
			Relevance of question	6	0.85		
			Question stated clearly	5	0.71		
		Has the way you communicate with antenatal clients changed as a result of Covid 19?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		How concerned are you that use of communication technology will lead to complaints?	Appropriateness of question	5	0.71	0.76	0.84
			Relevance of question	6	0.85		
			Question stated clearly	5	0.71		
		Overall Question/item rating score for 66 items				**(s-CVI) 0.92**	**0.78**

Table 4: Pregnant people validation survey on a 13 question/39 item rating scale by seven experts: Items rated as agree or strongly agree

Adapted categories from QMNC Framework	Themes from integrative review	Questions from pregnant women/people survey matched to categories from framework	Item	Number of experts who agree/strongly agree (n = 7)	Item CVI (i-CVI)	Overall question CVI (q-CVI)	Cronbach's Alpha
Organisation of care: *focuses on the availability and access of acceptable good quality services and adequate resources.* Organisation of care	• Access to health care • Connecting • Skills and knowledge	How would you describe your access to the following: Internet connection, cell phone signal, landline connection? ○ Excellent ○ Good ○ Poor ○ Do not have access	Appropriateness of question	7	1.00	0.90	0.75
			Relevance of question	6	0.85		
			Question stated clearly	6	0.85		
		How comfortable are you with using the following communication technologies?	Appropriateness of question	7	1.00	0.90	0
			Relevance of question	7	0.85		
			Question stated clearly	6	0.85		
		How challenging was it to use communication technology when connecting with your midwife during Covid-19?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
Practice categories: *Questions focus on the aspects of communication technology that are important to pregnant women/people*	Access to health care	How frequently do you use the technology below when contacting your midwife?	Appropriateness of question	7	1.00	1.00	0
			Relevance of question	7	1.00		
			Question stated clearly	7	1.00		
		Were you affected by the Covid 19 alert level 3 lockdown?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		Has the way you communicate with your midwife changed as a result of Covid -19?	Appropriateness of question	7	1.00	0.95	-0.316
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
Values: *Values within the framework focus on how communication practices have been tailored to meet the pregnant person's needs.*	• Connecting • Access to health care • Privacy and confidentiality	How frequently does your midwife use communication technology when contacting you?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		How satisfied are you with the way your midwife contacts you using communication technology?	Appropriateness of question	7	1.00	1.00	0
			Relevance of question	7	1.00		

			Question stated clearly	7	1.00		
		Have you sent pregnancy related photos to your midwife during your pregnancy?	Appropriateness of question	6	0.85	0.85	0.76
			Relevance of question	7	1.00		
			Question stated clearly	5	0.71		
		Have you sent pregnancy related video clips to your midwife during your pregnancy?	Appropriateness of question	6	0.85	0.85	0
			Relevance of question	7	1.00		
			Question stated clearly	5	0.71		
Philosophy: *Questions focus on how the use of communication technology is negotiated and used to promote health and wellness for pregnant women/people.*	• Connecting • Skills and knowledge	Do you believe the communication technologies you have used with your midwife have had a positive effect on your relationship with your midwife?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		Please indicate where you have sourced information from regarding your pregnancy (Please tick all that apply).	Appropriateness of question	7	1.00	0.95	0.894
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		From the list provided, please indicate on a scale from 1-5 how helpful were your sources of information? (With 1 being not helpful to 5 being extremely helpful).	Appropriateness of question	7	1.00	1.00	0
			Relevance of question	7	1.00		
			Question stated clearly	6	1.00		
		Overall Question/item rating score for 39 items				**(s-CVI) 0.938**	**0.832**

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Chapter 5

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

Chapter Overview

This chapter presents the findings from the online survey with LMC midwives in phase 1A of the multi-phase study and is presented as a published paper. The aim of this study is to describe midwives' experiences of using communication technology with pregnant women/people in Aotearoa New Zealand. Ethics approval related to the study was obtained and granted by the Auckland University of Technology Ethics Committee (AUTEC): 20/279 (See Appendix B).

The references are presented in this chapter as APA 7th edition, in accordance with a standardised formatting requirement for submission of the thesis through Auckland University of Technology and in accordance with the requirements of the journal in which it was published. (See Appendix H.3 for the journal PDF print copy).

Author contributions

This co-authored paper was the third publication submitted for this PhD research. The bibliographic details of this co-authored paper are:

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My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), Dr Tania Fleming (Secondary Supervisor) and Dr Gwen Erlam (Assistant Supervisor) involved: preparing and submitting the ethics application, conceptualisation, formal Analysis, investigation, and writing of the original paper.

Signed:

Karen Wakelin Date: 7th May 2024

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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; S. Wallwiener et al., 2016). Within midwifery, texting has enabled 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 & 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 & 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 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 woman/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 women/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 multi-phase 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. (K. 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 & Tashakkori, 2009). Ethical approval for the study was granted by Auckland University of Technology Ethics Committee (AUTEC 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 (K. Wakelin, McAra-Couper, Fleming, et al., 2023). Content validity index was used to evaluate the clarity of the instrument (D. 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 & 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 & 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 practising certificate
- Midwives working currently as a Lead Maternity Carer midwife

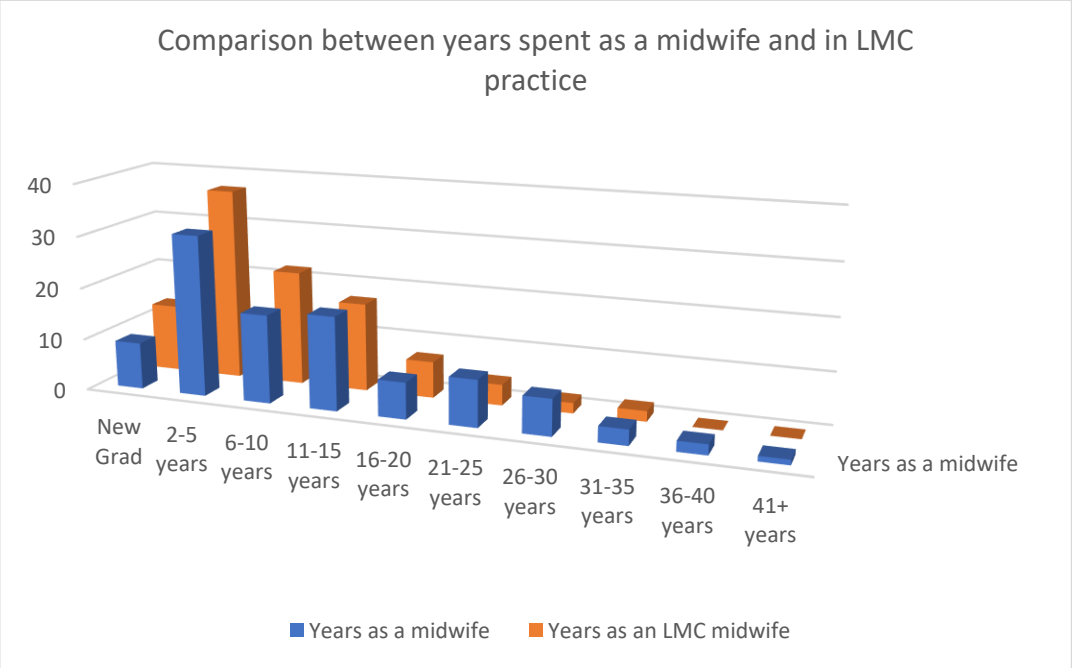
Results

This study reports on findings from phase 1 A of the multi-phase 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 1965-1980) and Millennials (1981-1996) classification. This is consistent with the average age of a midwife being 47 in Aotearoa NZ (Midwifery Council |Te Tatau o te Whare Kahu, 2021).

This study specifically sought the experiences of LMC midwives. Figure 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 2-15 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 |Te Tatau o te Whare Kahu, 2021).

Figure 1: Comparison between years spent as a midwife and years spent in LMC practice.



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: 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

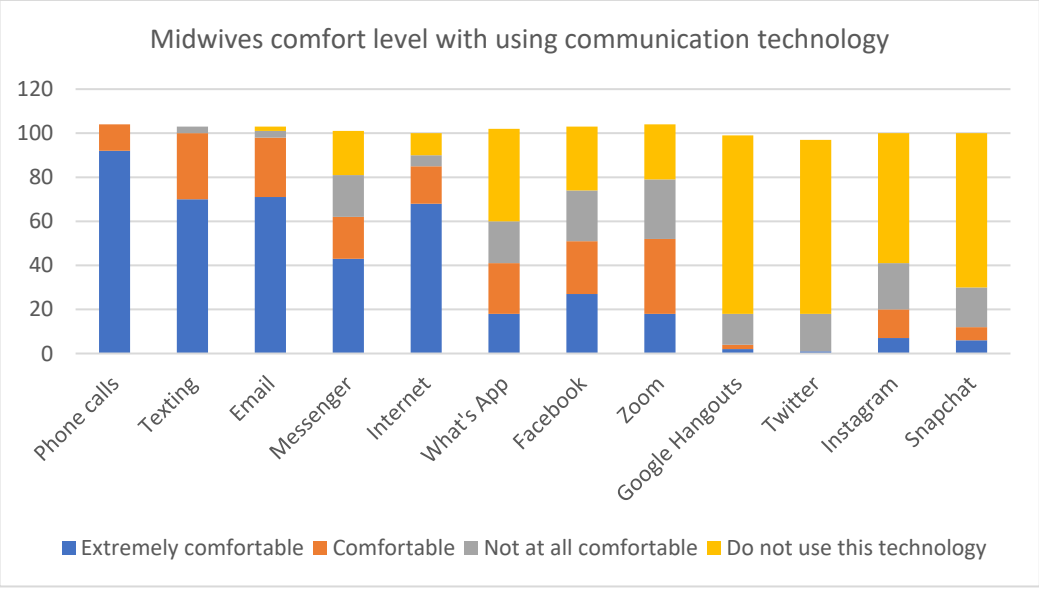
Midwives' knowledge and skills with using communication technology

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. Figure 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 women/people.

Figure 2: Midwives comfort level with using communication technology.



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).

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.

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

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).

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)

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; M. 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 did not 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.

(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 |Te Tatau o te Whare Kahu, 2016). 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.

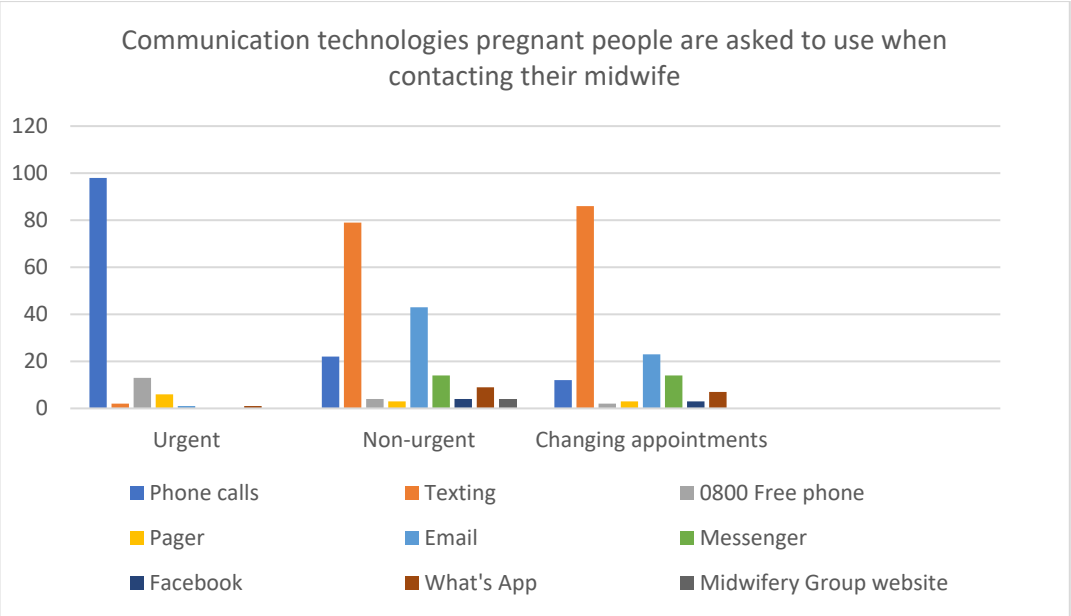
> *"Especially if I misinterpreted the women's communication or she doesn't understand my recommendations or requests" (Qs 23: MW 14).*

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 (figure 3).

Figure 3: Communication technologies pregnant people are asked to use when contacting their midwife.



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 autoreply 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 & 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 whānau.

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 (Te Tatau o te Whare Kahu|Midwifery Council, 2018). This includes how they use communication technology with

their pregnant clients and expectations around for example texting vs a phone call (Midwifery Council |Te Tatau o te Whare Kahu, 2016). 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; K. Wakelin & 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 & 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 autoreply 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.

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Chapter 6

Survey describing pregnant peoples' use of communication technology with their midwife in Aotearoa New Zealand.

Chapter Overview

This chapter presents the findings from the survey with pregnant women/people in phase 1B of the multi-phase study and is presented as a published paper. The aim of this study is to describe the experiences of how pregnant women/people use communication technology when connecting with their midwife. Ethics approval related to the study was obtained and granted by the Auckland University of Technology Ethics Committee (AUTEC): 20/279 (See Appendix B).

The references are presented in this chapter as APA 7th edition, in accordance with the standardised formatting requirement for submission of the thesis through Auckland University of Technology. This is different to the published version (See Appendix H.4 for the journal PDF print copy).

Author contributions

This co-authored paper was the fourth publication submitted for this PhD research. The bibliographic details of this co-authored paper are:

Wakelin, K., McAra-Couper. J., Fleming. T. (2023). Survey results describing how pregnant women/people use communication technology with their midwife in Aotearoa New Zealand. *The Practising Midwife 2*(01), 24-29. https://doi.org/10.55975/HDNG1858

My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), and Dr Tania Fleming (Secondary Supervisor), involved: preparing and submitting the ethics application, conceptualisation, formal analysis, investigation, and writing of the original paper.

Signed:

Karen Wakelin Date: 7th May 2024

Countersigned: Date: 7th May 2024

Co-author and Principal Supervisor: Professor Judith McAra-Couper

Countersigned: Date: 7th May 2024

Co-author of paper and Secondary Supervisor: Dr Tania Flemming

Introduction:

Communication technology, particularly texting, has become a mainstream way to communicate between people. In Aotearoa New Zealand (NZ), 91% of adult users over 18 years own a smart phone (Research New Zealand, 2015) which compares to smartphone use by people in Australia and the United Kingdom (Granwal, 2021; O'Dea, 2021). Within maternity care, communication technology has enabled childbearing people to access a midwife for support and reassurance, change appointments or request health information (Cummins et al., 2019; Gasteiger et al., 2019; Shroder et al., 2018).

An integrative literature review was undertaken of peer reviewed studies between 2010-2021 to explore specifically how pregnant women/people[1] and midwives used communication technology to connect with each another. Five studies met the criteria, with the overarching theme of connection identified (K. Wakelin et al., 2022). This connection occurred regardless of the communication platform used, and whether the connection was synchronous (occurring at the same time) such as face-to-face via video technology or asynchronous (where there is a delay in communication) such as via text or forum post (Gasteiger et al., 2019; McCarthy et al., 2017; Shroder et al., 2018).

Concerns were identified specifically in relation to asynchronous communication and the potential for misinterpretation or information taken out of context which could impact on the safety of care for pregnant people (Dalton et al., 2014).

Effective communication between pregnant women/people and midwives is essential to ensure quality maternal and newborn care, and was an important component identified in an evidence informed Quality Maternal and Newborn Care (QMNC) framework (Renfrew et al., 2014). Women/people felt strengthened and empowered when care was individualised and tailored to meet their needs.

In Aotearoa NZ, midwives work in partnership with the pregnant woman/person and their whānau (family) in a model of continuity of care from early pregnancy through to six weeks postpartum (New Zealand College of Midwives, 2015). What is unknown is how pregnant women/people are using communication technology with their midwife in this model and how this contributes towards quality maternal and new-born care.

[1] In supporting use of inclusive terminology, pregnant women/people is the term used even though this term may not have been used by authors in cited studies.

Aim:

The aim of this survey was to describe the experiences of how pregnant women/people use communication technology when connecting with their midwife.

Method:

This study reports the survey findings from phase 1B of a larger three phase mixed methods sequential transformative study, which incorporates both quantitative and qualitative methods using a theoretical framework (Tashakkori & Teddlie, 2003). Phase 1 involved collecting survey data from midwives (1A) and pregnant women/people (1B). The findings from the survey will inform questions for interviews in phase 2 with midwives (2A) and pregnant women/people (2B). These findings from Phase 2 A & B will then inform questions for interviews with maternity stakeholders in Phase 3. Questions for the survey were informed by using the QMNC framework (Renfrew et al., 2014) and findings from an integrative literature review undertaken prior to data collection (K. Wakelin et al., 2022).

Development of the survey tool:

The development of questions for the online survey was undertaken in two stages; (1) from themes identified through an integrative literature review specifically exploring how communication technologies are used between pregnant women/people and midwives and (2) assessing the validity and reliability of questions using an expert advisory group (EAG) of midwifery academics with experience in both quantitative and qualitative research designs (K. Wakelin, McAra-Couper, Fleming, et al., 2023).

Four themes were identified from the review: (1) connecting; (2) access to healthcare; (3) privacy and confidentiality; (4) and lack of skills and knowledge which 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 questions were largely quantitative, however there were text boxes provided for participants to expand on their response to some questions. The online survey was created using an online Research Electronic Data Capture tool (REDCap) (Harris et al., 2019). An example of questions used in the survey are shown in Table 1.

Table 1: Mapping of questions onto QMNC framework

QMNC categories	Questions developed for online survey	Themes from integrative literature review
Practice Categories	Elements of communication technology that are important to women	• Access to health care
Organisation of care: *focuses on the availability and access of acceptable good quality services and adequate resources.*	Pregnant women/people were asked about their usual place of residence, and access to communication technology eg internet, mobile phone. Eg; Please indicate whether your usual place of residence is: urban, rural, semi-rural, remote rural Do you have access to the internet? Do you have a mobile phone which only you can use?	• Connecting • Access to health care
Values: *how care has been tailored to meet women's circumstances and needs.*	Questions were developed to assess whether use of communication technologies is meeting the needs of pregnant women/people. Eg: How satisfied are you when your midwife uses the following technology to contact you? *[A list of technologies is then provided]*	• Connecting
Philosophy: *how optimising biological, psychological, social and cultural processes strengthened women's/people's capabilities.*	*Questions were developed to identify whether using communication technology helped to strengthen women's/people's capabilities and was seen as having a positive effect on their relationship with their midwife.* *Eg: What are the main communication technologies you use when contacting your midwife?* *What types of communication technologies have you used to inform yourself about your pregnancy? [A list of options was provided]*	• Connecting, • Privacy and confidentiality
Care Providers: *The focus is on practitioners who combined clinical knowledge and skills with interpersonal and cultural competence.*	*Adapted to include questions to identify comfort level with various types of communication technologies.* *EG: How comfortable are you with using the following communication technologies? [A list of options was provided.]* *Do you have any concerns about your privacy when using communication technology to connect with your midwife?*	• Skills and knowledge, • Privacy and confidentiality

Recruitment

In recruiting participants, the first author identified herself as a midwife and was granted permission by the administration team to advertise the research on the closed pregnancy

Facebook groups. Pregnant women/people who met the criteria were invited to participate in an online survey.

Inclusion criteria:

- at least 20 weeks' gestation
- at least 18 years of age
- have access to a mobile phone which has text / email / internet capabilities
- booked and receiving care with a midwife from at least 14 weeks gestation.

Data Collection:

In phase 1B, online survey data was collected from pregnant women/people through advertising every two weeks on closed nation-wide pregnancy Facebook groups in Aotearoa NZ from 10th August-13th October 2021. Ethical approval for the study was granted by Auckland University of Technology Ethics Committee (AUTEC 20/279).

Data analysis:

Descriptive data was analysed using Statistical Package for Social Sciences (SPSS) for Windows version 27. Descriptive statistics describe what is happening within a particular population when little is known of a phenomenon (Gillis & Jackson, 2002). For questions, where qualitative responses were required, these were analysed using a basic form of thematic analysis (Braun & Clarke, 2022). Data was initially colour coded by the first author, organised under areas of similarity, and reviewed for commonalities to support the quantitative data. These were then discussed and agreed by the other authors.

Results

Demographic Data

Forty-seven pregnant women/people responded to the online survey with an average age range between 26-30 years so slightly under the average age of 31 years reported by NZ (Stats NZ|Tatauranga Aotearoa, 2022). Just over three quarters of the participants (76.6%) reported NZ European ethnicity, 10.6% Māori, 6.4% Asian, 4% Pacific Peoples and the remainder identified as Other. When compared with the last 2018 New Zealand Census, NZ European were slightly overrepresented, with Māori and Pacific Peoples underrepresented (Stats NZ, 2020).

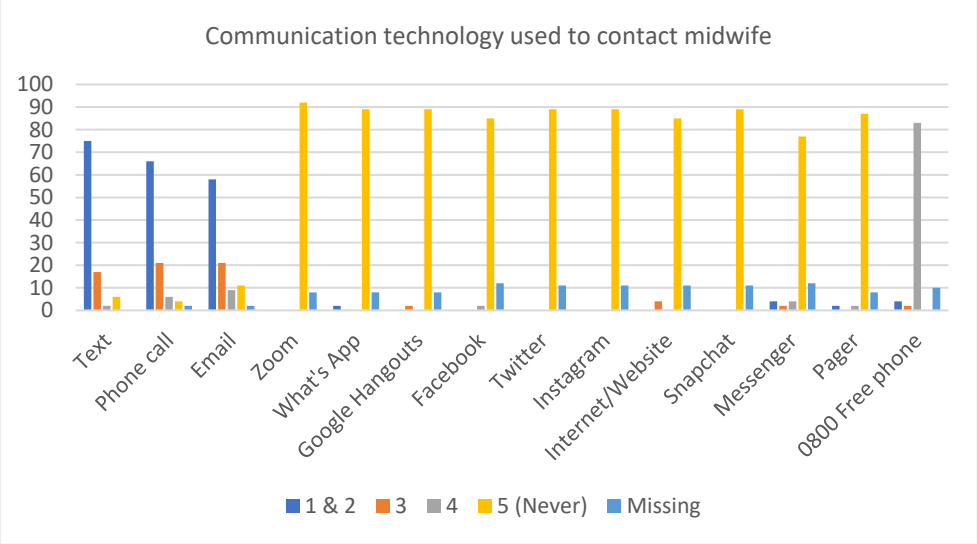
When comparing usual place of residence, almost 80% of participants lived in an urban area, with 8.5% indicating they live in a rural or semi-rural area and 2.1% live remote rural. These findings were similar to those reported by the survey undertaken with midwives in Phase 1A of the multi-phase study.

Access to their midwife using communication technology

All participants indicated they had access to a communication device at home, with all but one participant stating they had access to a mobile phone which only they used.

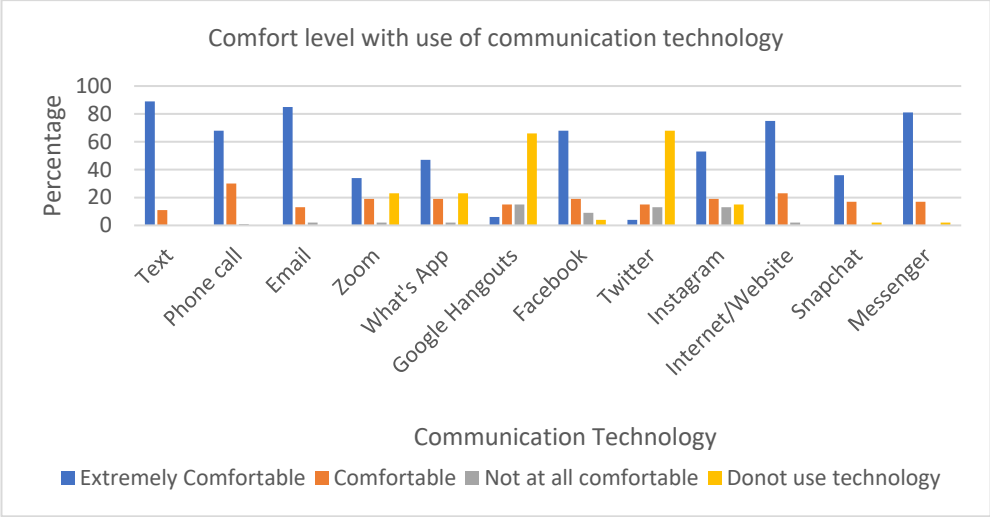
Participants were asked to rank from 1-5 with 1 being most used and 5 never used which communication technology they used to contact their midwife, (figure 1) and their comfort level with using the technology (figure 2).

Figure 1: Communication technology most used by pregnant women/people to contact their midwife.



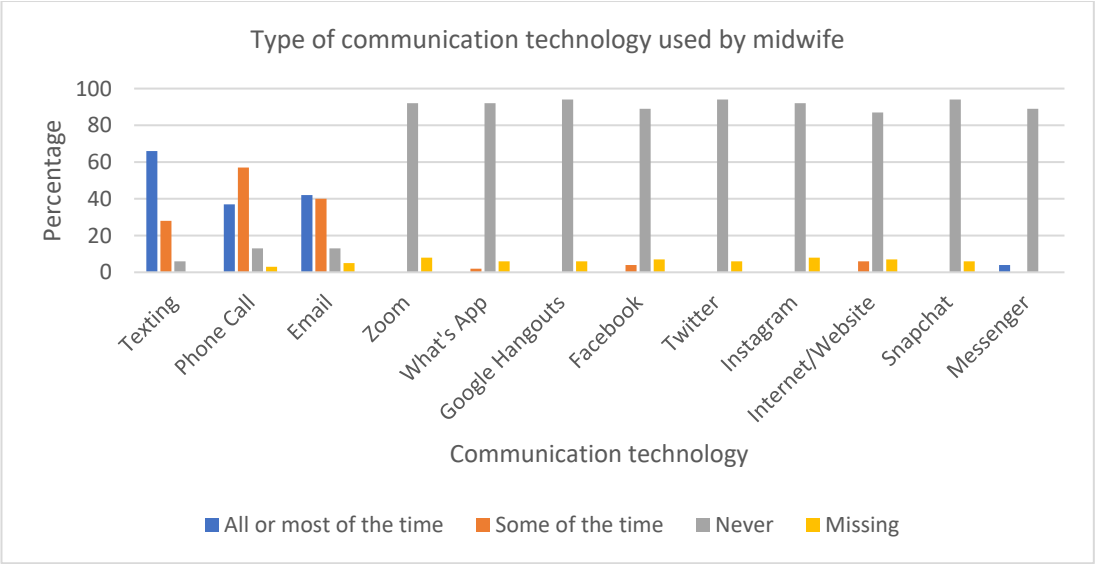
Texting was used by 75% of participants, followed by phone calls (66%) and emails (58%). When comparing comfort level (figure 2), 100% of participants indicated they were either extremely comfortable or comfortable with texting, and 98% with phone calls and email, suggesting that pregnant people are comfortable and happy to use this technology when connecting with their midwife.

Figure 2: Comfort with use of communication technology.



Pregnant women/people indicated that texting, phone calls and emails were often used by their midwife to contact them (figure 3). The results suggest that while there are a variety of communication technologies available, texting, phone calls and email are commonly negotiated for use between the pregnant woman/person and their midwife.

Figure 3: Type of communication technology used by midwife to contact pregnant women/people.

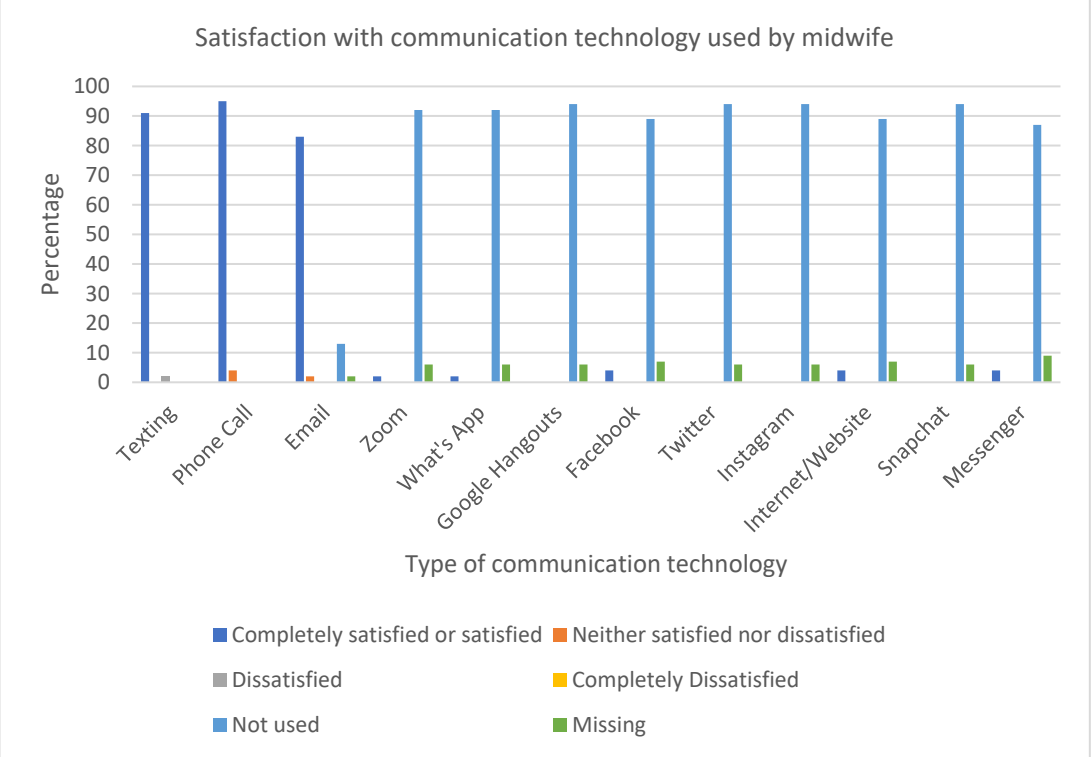


There were other forms of communication technology that participants felt comfortable using, for example, Facebook, Internet/website, and Messenger, however, these technologies were not used by pregnant women/people or midwives when connecting with one another.

Influence of communication technology on the relationships between pregnant women/people and midwives

Pregnant women/people were asked whether they felt using communication technology had a positive effect on their relationship with their midwife. Eighty one percent of participants indicated they strongly agreed or agreed that CT had a positive effect on their relationship. When comparing how satisfied people were with the technology used by their midwife, (figure 4), almost all participants (95%) were completely satisfied or satisfied with their midwife calling them with 91% either completely satisfied or satisfied with their midwife texting. The technologies commonly associated with social media were indicated as not used by midwives or pregnant people when connecting with one another.

Figure 4: Satisfaction with communication technology used by midwife.



Privacy and confidentiality of information

Participants were asked whether they had any privacy concerns when connecting with their midwife.

Ninety-four percent did not have any concerns around privacy of information, however, when asked to leave a comment, in relation to sending photos or video clips, the response was mixed. Thirty-two participants (68%) provided a comment in response to this question.

Of those who responded, 62% were either not concerned about privacy, or did not feel the need to send photos or videos.

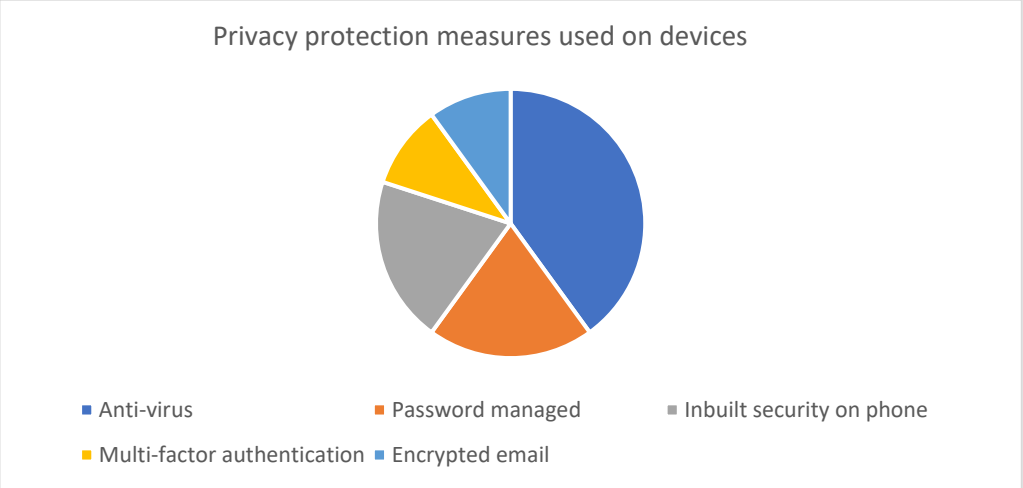
> "I'm not worried about privacy; I just haven't had any need to send a photo or video yet" (QS 17: P:18)

However, for the remaining 38%, privacy was a concern with a preference for face-to-face or phone call contact with their midwife if they had concerns.

> "Wouldn't send anything confidential that way, would wait to show at face-to-face visit" (Qs 17: P: 32)

When participants were asked about privacy/security measures on their devices, the majority (79%) did not use any. Of those that did, antivirus software was the main protection used (figure 5).

Figure 5: Privacy protection measures used on devices



This general lack of concern around privacy when using technology seems to be out of sync with concerns raised by health professionals (Leahy et al., 2017; Nettrour et al., 2019) and will be explored further in the next phase of the study.

Discussion

Texting was the most common form of communication technology used by pregnant women/people and midwives to connect with one another which has similarly been reported in other areas of maternity (Gasteiger et al., 2019; Shroder et al., 2018). It is possible that pregnant women/people are aware of how busy their midwives are, and texting offers a way to connect in a non-intrusive manner. While pregnant women/people indicated they were satisfied with their midwife using phone calls, texting, and email, it is difficult to draw

conclusions on the impact this had on the relationship. It does suggest however, that technology, which is negotiated in an individualised manner, is tailored to meet the person's needs. Within a midwifery model of continuity of care, this contributes towards a relationship of trust. Trust, individualised care and empowerment have shown to be strengthened through a model of continuity of midwifery care (Perriman et al., 2018) which contributes towards ensuring quality maternal and newborn care (Renfrew et al., 2014).

The importance in negotiating how communication technology is used is highlighted by conflicting results in relation to privacy and confidentiality of information sent. While most participants indicate not having any concerns, and do not use any specific privacy protection software, over a third indicated they would not send photos, videos, or confidential information. Participants preferred to speak face-to-face or have a phone conversation with their midwife. For some, communication technology provides distance to enable questions or concerns to be raised which might otherwise not be done face-to-face (Gasteiger et al., 2019; Gleeson et al., 2019). While for others, there appears to be a tangible need to be seen or heard which cannot be achieved through virtual means. Communication which engages the senses has been identified within the literature as being important to assist clinicians with diagnoses and decisions around care (Botrugno, 2019). So while in some instances images may be useful in helping practitioners make decisions (Nettrour et al., 2019), midwives need to negotiate and individualise how this communication occurs based on what is important for the individual.

Limitation:

The small number of participants in this study and missing data with some questions is a limitation. Advertising on Facebook may not reach the targeted childbearing population, particularly those aged between 18-25, and along with the frequency of postings on Facebook sites may mean posts quickly become overtaken by newer posts. Consideration will therefore be given to other forms of recruitment in future studies.

Implications for midwifery practice and future research

The findings from this study have helped to identify gaps which will be explored in interviews with pregnant women/people in the next phase of this mixed methods study (Teddlie & Tashakkori, 2009).

These include exploring further:

- the impact communication technology has on developing relationships between pregnant women/people and midwives within a midwifery continuity model of care,

- issues around privacy and confidentiality of information when using devices.

Conclusion:

Communication technology contributes towards quality maternal and newborn care through enabling pregnant women /people to connect with their midwife. Caution is needed however in ensuring privacy of information is protected when using devices. This study highlights the need for wider professional discussions around this area. If pregnant women/people are comfortable and satisfied with how technology is being used, they are more likely to reach out to their midwife if they have concerns and feel confident their midwife will respond in a manner that is acceptable to them.

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Chapter 7

Using an online platform for conducting face-to-face interviews.

Chapter Overview

This chapter outlines the experiences I had in conducting face-to-face interviews using an online platform (phase 2 of the multi-phase study) and is presented as a published paper. The aim of this paper is to further the discussion on the growing body of knowledge around conducting interviews using an online platform. These discussions highlight the valuable contributions that online interviewing offer as a valid research tool that differs to that of in-person face-to-face interviews. An amended ethics application relating to phase two of the study was obtained and granted by the Auckland University of Technology Ethics Committee (AUTEC): 20/279 (See Appendix B).

The references are presented in this chapter as APA 7th edition, in accordance with the standardised formatting requirement for submission of the thesis through Auckland University of Technology and in accordance with the requirements of the journal in which it was submitted to. (See Appendix H.5 for the journal PDF print copy).

Author contributions

The co-authored paper was the fifth publication over the course of this PhD study. The bibliographic details of this co-authored paper are:

Wakelin, K., McAra-Couper, J., Fleming, T. (2024). Using an online platform for conducting face-to-face interviews. *International Journal of Qualitative Methods, 23.* https://doi.org/10.1177/16094069241234183.

My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), and Dr Tania Fleming (Secondary Supervisor), involved: preparing and submitting the ethics application, conceptualisation, formal analysis, investigation, and writing of the original paper.

Signed:

Karen Wakelin Date: 7th May 2024

Countersigned: Date: 7th May 2024

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Countersigned: Date: 7th May 2024

Co-author of paper and Secondary Supervisor: Dr Tania Flemming

Introduction:

Interviews are a way to explore in greater detail with participants their experiences, understandings, and opinions of a particular issue than would otherwise be possible through a questionnaire or survey (Burns & Grove, 1993; Gillis & Jackson, 2002). Traditionally, interviews have taken place in-person however, due to the ubiquitous nature of communication technology, a variety of online methods and platforms have arisen such as podcast interviews (Jorgensen & Lindgren, 2022; Newman & Gallo, 2019), or asynchronous and synchronous online interviewing (Bampton et al., 2013; Lobe & Morgan, 2021; Mirick & Wladkowski, 2019; H. O'Connor & Madge, 2017). Online interviews can take place either asynchronously through emailing questions to participants and gathering responses that way (Bampton et al., 2013), or via synchronous (real-time) means such as using an online chat room, face-to-face (FTF) via video technology which mimic an in-person FTF interview (Lobe & Morgan, 2021).

Online interviews are increasingly being used via online platforms such as Skype, Facetime, Google Hangouts and Zoom and enable people in different geographical locations to communicate in real-time (Deakin & Wakefield, 2014; L. M. Gray et al., 2020; Hanna & Mwale, 2017; Jenner & Myers, 2019; Mirick & Wladkowski, 2019; Tucker & Parker, 2019). There are mixed responses within the literature regarding the advantages or disadvantages with online FTF interviews vs in-person FTF interviews. While online FTF interviews offer the opportunity to visually see the person and pick up on body language, the visual cues are limited due to only seeing the person from the shoulders up (Hanna & Mwale, 2017). 't Hart (2023) argues that the importance of being physically in the same space as someone else is necessary for an emotional connection that is 'fostered by the interviewer and participant sitting together in silence and communicating via the physicality of body cues' which is missing when moving to an online format (p. 23). Other studies have identified no differences between the two and found that participants are more likely to share when FTF online rather than in-person due to the space and distance with which the interview is taking place (Jenner & Myers, 2019; Self, 2021). For people who are socially awkward, or who feel uncomfortable interacting in-person, the online platform is possibly liberating as it enables connections to occur in a less confronting or intimidating manner than being in-person (Allred & Atkin, 2020). Online interviews have also been shown to be advantageous in enabling the participant to feel more comfortable without having to worry about inviting the researcher into their home or workplace (De Villiers et al., 2021).

Prior to the global Covid-19 pandemic, online FTF interviewing in comparison to in-person FTF interviewing was still considered relatively uncommon (Deakin & Wakefield, 2014; H. O'Connor

& Madge, 2017), however, in response to restrictions on in-person FTF interactions, researchers needed to adapt the way they collected interview data during this time (’t Hart, 2023; O’Sullivan et al., 2021; Self, 2021). Technology is continually evolving, and alongside this, developments, and improvements in infrastructure to ensure equity and access to the technology. In New Zealand for example, there is recognition around the need for equity and accessibility to technology which will result in 99.8% of the population expecting to have access to broadband and mobile coverage by 2023 (New Zealand Health and Disability System Review, 2019). Globally, the need for connectivity is recognised as a basic human right, with the need to *“develop the infrastructure for information and communication technologies…to promote equitable, affordable and universal access”* (World Health Organization, 2021, p. 4). With the move to promoting equitable and affordable access to digital technologies, there is likely less tolerance towards undertaking costly travel to attend in-person meetings/interviews, if these can instead be conducted in an online format, and especially when considering the impact travel has on climate change. In November 2016, the legally binding international treaty on climate change known as the Paris Agreement came into force with the aim of limiting global warming to 1.5°C above pre-industrial levels by substantially reducing greenhouse gas emissions (United Nations Climate change, n.d.). As a result, New Zealand have set goals around reducing petrol and greenhouse gas emissions (Ministry for the Environment, 2022). So, moving qualitative data collection techniques to online forums has potential to contribute towards sustainability of our planet.

As people become more comfortable with accessing and using technology, they are potentially becoming less comfortable and more anxious with in-person FTF situations (Allred & Atkin, 2020; Rotondi et al., 2017). Further to this, society has become more familiar with using video technology to connect and communicate with one another as a result of Covid-19 restrictions on in-person contact both on a personal level and in the move to ‘work from home’ (Costa et al., 2022; Green et al., 2020). Use of video-technology has increasingly been used within healthcare through Telehealth which requires a video consultation between a health professional and health consumer (Lupton & Maslen, 2017; Ministry of Health, 2020b). This could be considered not too dissimilar to interviews being conducted online by a researcher and participant.

The world is changing around how people are communicating with one another. Consideration is therefore needed on how to combine the best parts of in-person interviews with the best parts of communication technology to create valid and reliable ways of gathering data that not only captures the essence and benefits that comes with being ‘in-person’, but that are sustainable and economically beneficial for all concerned. There is a need therefore to open

and develop further dialogue around how this might look when conducting qualitative FTF research. Is there a need for in-person interviews when they can just as easily be conducted in an online format? Can FTF interviews conducted in an online format still capture the 'essence' or 'nuances' of in-person connections, and if so, how can this be achieved? The implications are such, that problems with connectivity that were identified early on with technology may not be so prevalent in the 2020's given the improvements in infrastructure to create a more accessible and equitable service.

This paper reports on the experiences of the first author in conducting online FTF interviews with fourteen midwives and five pregnant women/people on how they use communication technology to connect with one another. It is important to note that asking participants about their experiences with being interviewed online did not form part of the interview schedule. Instead, the insights offered are based on the experiences with using an online platform to conduct the interviews. Any comments made by participants came up as part of the interview indirectly, however, they provide further insight into the overall discussions around how using an online format for conducting interviews can be considered a valid research tool that is different from in-person FTF interviews.

Aim:

The purpose of this paper is to highlight the first author's experiences with using an online platform to conduct FTF semi-structured interviews with midwives and pregnant women/people in New Zealand. The online FTF interviews provide insight into the valuable contribution that online interviews offer as a valid research tool that differs to that of in-person FTF interviews.

Methodology:

A mixed methods multi-phase sequential transformative design was used to explore how communication technology is used between midwives and pregnant women/people in New Zealand. The theoretical framework guiding the research is the evidenced informed Quality Maternal and Newborn Care (QMNC) framework developed by leading midwifery researchers (Renfrew et al., 2014). The researchers undertook a meta-synthesis of qualitative studies which explored women's/people's perspectives and experiences of maternity care. A systematic review of studies reporting on workforce groups providing maternity care was also undertaken to identify effective and ineffective practices. The results from these analyses identified five essential characteristics that were needed to ensure high quality care that would meet the

needs of women/people and their babies. The five categories informing the framework are (1) Identification of practice categories (aspects that were important to women); (2) organisation of care; (3) values; (4) philosophy; and (5) characteristics of the care providers. Their findings showed that when care was provided in an individualised and respectful manner, women felt strengthened and empowered (Renfrew et al., 2014). The framework therefore was ideal to explore how communication technology contributes towards quality maternal and newborn care through the identification of effective and ineffective communication technology practices used by midwives and pregnant women/people.

A transformative lens has also been taken throughout this mixed-methods research to 'give voice' to the participants in the study. A transformative lens "ensures improvement in human interests and society through addressing issues of power and social relationships" (Sweetman et al., 2010, p. 441). An opportunity to highlight a transformative approach is shown through identifying the potential contribution that FTF online interviews can make within the field of qualitative research. This is important, particularly within a culture of changing communication technology practices, where participants may not feel comfortable within an in-person setting (Biglbauer & Korajlija, 2023; Floridi, 2014).

Methods

Online semi-structured interviews were conducted with midwives and pregnant women/people during the second phase of a mixed method multi-phase sequential transformative study. In keeping with a sequential design, the findings from the online survey in phase one of the study informed questions for the semi-structured interviews in phase two of the study (J. Creswell & Plano clark, 2018; Teddlie & Tashakkori, 2009).

Setting

The online FTF interviews were conducted using Microsoft Teams with midwives and pregnant women/people in New Zealand from September 2022 – May 2023. The first author and participants were geographically dispersed around the country, and each connected online to the interview from their own homes.

Participants

In this second phase of the mixed methods multi-phase study, participants who had previously undertaken an online survey in phase one, had indicated they were happy to take part in an interview by clicking on the last question of the survey. This question took them to a separate window which asked them to provide contact details. Fourteen midwives and five pregnant

women/people indicated they were interested in taking part in an online interview. The first author then emailed the participants inviting them to take part in an online interview. Once they had agreed to be interviewed, a participant information form and consent form were then emailed to participants and a time was then negotiated for the online interview. Online interviews took between 40-60 minutes.

Piloting the online interviews

Prior to commencing online interviews, a 'test run' using the Microsoft (MS) Teams platform was undertaken with a midwifery colleague who had not been involved in the online survey nor would be a participant in the online interview. Microsoft (MS) Teams was selected due to the first author's familiarity with using this platform. Despite this, there was still uncertainty around how conducting an online interview using the recording and transcription service would perform. Familiarity and comfort with the technology and interview guide are important prior to conducting interviews to identify any potential difficulties with the software (De Villiers et al., 2021; L. M. Gray et al., 2020; Hanna & Mwale, 2017; Tucker & Parker, 2019). Piloting the interview was beneficial as it enabled the first author to not only test the questions, but importantly, to identify if there were any issues with either the connectivity, recording or transcription function when using the platform.

Analysis

Thematic analysis was used to analyse the data. Braun & Clarke (2022) outline a six-step process which includes 1) familiarisation with data, 2) coding, 3) generation of initial themes, 4) developing and reviewing themes, 5) refining, defining, and naming themes, and 6) write up. The first author undertook the analysis of the data and met regularly with the other two authors to discuss the coding and development of themes.

Findings from the interviews are not included in this paper and are under review for publication in other journals. This paper however, reports on the experiences and insights gained from the first author in using an online platform to conduct FTF interviews. Ethical approval was obtained and granted by Auckland University of Technology Ethics Committee (AUTEC 20/279).

Findings and discussion

Two key areas were identified by the first author that could potentially contribute towards the value of online interviews within the field of qualitative research. These areas highlight the

benefits and challenges with online interviews. There are benefits with conducting online interviews through the potential to 'capture the essence of the person' and through the flexibility of the technology in enabling FTF connections. Challenges were noted around connectivity and participants' preferences for in-person interviews. The following highlight how these contributions are made using online FTF interviews. It is important to reiterate, that the findings and discussions are presented as insights that were gathered from the first author when conducting online FTF interviews with midwives and pregnant women/people.

Benefits with online interviewing

Capturing the 'essence of the person'

Online platforms such as MS Teams which include videoconferencing as one of its features enables both the participant and the researcher to connect from different locations and to 'be seen' synchronously in real time. When conducting the online interview, participants could choose whether to have their video camera on or switched off and all participants were asked whether they were happy for the interview to be recorded. These choices are part of a person's right to self-determination and autonomy (Borbasi & Jackson, 2016). Only one participant chose to keep their video off, and for this interview, the recording was solely audio-recorded, though the researcher kept their video on so was visible to the participant. Being visible to participants has been shown to be important in enabling participants to respond to the researcher's non-verbal cues as well as contributing towards establishing rapport (Archibald et al., 2019). It is acknowledged however, that there was not an ability for the researcher to pick up on visual cues during this interview, which could potentially impact on the quality of the interview, (Novick, 2008), however, the focus then became reliant on the intonations used with the participants voice, as would be the case if the interview was conducted over a telephone (Novick, 2008).

One of the main advantages with videorecording the online interview was being able to focus on what the participant was saying during the interview knowing that the visual cues and non-verbal/body language would be captured during the recording. Interviews with midwives and pregnant women/people were only conducted online, so it is not possible to make comparisons between in-person FTF or online FTF. However, there is evidence to suggest that when researchers have conducted both, there is little difference noted between the gathering of information between the two situations.

Jenner and Myers (2021) found that their Skype interviews closely resembled the in-person FTF interviews in terms of depth of data and information shared by participants. In a similar manner, Sedgwick & Spiers (2009) noted that their use of videoconferencing for interviews with students were conducted in a conversational type of manner due to the ability for participants to be FTF. This would suggest, that 'the essence' of being in the same space during the interview was able to be captured using an online format through the ability to visually respond to the participant's cues, maintain eye contact and conduct 'active listening' responses with umms and ahhs as would normally occur in an in-person FTF context. De Villiers et al. (2021) found that researchers use facial expressions and other forms of body language to build rapport when conducting interviews online via a videocall. This was the case for interviews with midwives and pregnant women/people. Maintaining eye-contact via a screen was enhanced by strategically placing the interview schedule in front of the laptop in an unobtrusive manner which encouraged asking and responding to questions in a more natural and conversational manner. This enabled eye contact to be maintained during the interview with just a quick glance to ensure areas were covered. Towards the end of the interview, the first author made a reference to the interview guide to ensure nothing had been missed.

Co-present, or absent presence are terms used to describe people being present but not physically in the same space (Gergen, 2002; Haddouk, 2015). Haddouk (2015) discusses the notion of presence at a distance, and the emotional connection that is still made despite not physically being in the same space as a person. Each of the participants in our study had been asked about their comfort when using technology, to gauge if there was a connection between usage and comfort level. All participants responded to being comfortable with using a variety of platforms when connecting with others. There is evidence to suggest that the more a person uses technology, the more comfortable and satisfied they are with using this technology (Swanson et al., 2018). There is further evidence to suggest that the more people use communication technology, the less comfortable they feel when in in-person situations (Biglbauer & Korajlija, 2023; Rotondi et al., 2017). Floridi (2014) suggests how we use communication technology is changing the way we communicate which may potentially impact on future generations' comfort with in-person interviews. Online FTF interviews may be beneficial in helping to connect people who otherwise feel uncomfortable when in an in-person situation. The benefits in using the technology to enable these connections to occur can be highlighted further through the flexibility and convenience of the technology when undertaking online FTF interviews.

Flexibility and convenience in enabling face-to-face connection.

One of the key findings in our study conducted with midwives and pregnant people on how they use communication technology to connect with one another, highlighted the flexibility and convenience of the technology in enabling these connections to happen (K. Wakelin, McAra-Couper, & Fleming, 2023; K. J. Wakelin et al., 2023). In a similar way, the flexibility and convenience with how the technology was used was noted when undertaking FTF interviews using an online platform.

There was flexibility offered for participants to connect via technology through a link emailed to them. They could then join the interview via a computer, lap-top or mobile phone. This was advantageous as it enabled the researcher and participant to 'be present' virtually without the associated costs required in time and travel that would be required to attend an in-person interview (Archibald et al., 2019; L. M. Gray et al., 2020; Lobe & Morgan, 2021; Mirick & Wladkowski, 2019; Sedgwick & Spiers, 2009). As well, as having potential environmental benefits such as reducing greenhouse gas emissions (Ministry for the Environment, 2022).

The flexibility with using communication technology for online interviews has occurred all the way through the process. This began with emailing participants the information and consent forms prior to the interview beginning, using the online platform screensharing facility, and using the videorecording and transcription functions that are then easily downloaded onto a password protected device. The screen sharing facility on MS Teams enabled the first author to go through the participant information form and consent form with the participant at the beginning of the interview (just as they would if the interview was being conducted in-person FTF). Advantages of screensharing has also been identified with other online interviews (L. M. Gray et al., 2020).

Having conducted a trial run interview with a colleague prior to the first interview provided the first author with an ability to trust the functionality of the online platform. This trust provided a sense of freedom during the interview knowing that there would be opportunity to review the interview in its entirety at a later stage and to observe again verbal and non-verbal body language. This ability to relive the interview has similarly been identified as an advantage over in-person or telephone interviews (Sedgwick & Spiers, 2009). Being able to relive the interview through watching the videorecording was invaluable during both the familiarisation and coding phases as part of thematic analysis (Braun & Clarke, 2022). The first author was able to be

transported back to the interview and listen and observe the nuances, facial expressions, and body language of the participant during the interview.

Following the recording, the transcription was downloaded onto an electronic word document. The videorecording was then reviewed against the transcription. The video recording function enabled play forward 10 seconds, and play backwards 10 seconds along with pause, play and stop functions. It was convenient to be able to rewind by 10 seconds, as this was often all that was needed if there was a word that was slightly inaudible, or if the transcription had incorrectly scribed a word. In these situations, rewatching the video provided an ability to lipread while listening to what the participant was saying so that the correct word could be identified. Without this ability to view the recording, transcribing would have been more difficult and potentially more time-consuming while trying to play and replay to capture the inaudible word. For example, in the interview with pregnant woman/person, Jane (not her real name), the original transcript from the Teams recording was:

> "I kind of said to her if it was ever an emergency or mastering that I wanted to know, I would call" (Jane).

The word 'mastering' didn't seem to be in context, however, when the recording was reviewed, the first author was able to lip-read while listening to Jane. In doing so, was able to correctly identify that what Jane said was:

> "I kind of said to her if it was ever an emergency or a fast thing that I wanted to know, I would call" (Jane).

The term a 'fast thing' made sense, as Jane was discussing what she would need to do if she needed to contact her midwife quickly.

While reviewing the transcription still took time (approximately three hours for a 45-minute interview), being able to capture both the video recording and transcription at the same time using the functions available on the computer was an efficient way to collect data. Further to this, having an ability to relive the interview by watching the recording gave the first author a sense of being back in the interview when transcribing and analysing the data. It was also convenient to make notes in a comment box using the 'review' tab on the word document alongside the transcriptions as various thoughts came to mind, adding to the convenience with using technology.

The convenience with attending an online interview which could be attended by the participant from their own home, meant all participants attended the interview. Deakin and Wakefield

(2014) also found a similar finding in their study with all participants showing up to online interviews. The flexibility and convenience with using technology was further highlighted when communicating with a participant who had been unable to attend their initial interview due to an adverse weather event which had cut electricity and internet. A follow-up email was sent to the participant by the researcher, and another day and time was negotiated. In another incident, a midwife was running late due to the on-call nature of midwifery practice and had texted the first author. The online interview was delayed by half an hour. In these situations, the challenges brought about in using communication technology could have impacted on the interview, however, the convenience with the technology meant it was easy to re-connect and re-schedule for a later time. The convenience with being able to communicate and reschedule appointments were similar findings reported by participants in our study when using communication technology to connect with one another (K. J. Wakelin et al., 2023).

Challenges with online interviewing

While online interviews were conducted with 19 participants, only one of the participants in our study indicated they would have preferred an 'in-person' interview rather than online due to an inability to fully get a sense of the person. As indicated earlier, participants weren't asked about their experiences with being interviewed online, however Alana (not her real name) offered this insight during the interview.

> *"I wanted to do it [interview] in person because there's a whole lot of nuances from you that I can't read. There's your body language that I can't read. I can see you like you see me from here up, but that's only a quarter of the picture. There's a whole lot of communication that's just not here. And to me, I'm only getting a little bit, I suppose, because I'm such a visual person with my complexities around reading and writing" (Alana).*

't Hart (2023) suggests that the screen acts as a barrier as there is a lack of emotion when not physically present with another person and reduces the connection to a disembodied one, where the person is visualised from the shoulders up. Hanna & Mwale (2017), would agree with having identified the online video call as limiting the ability to pick up on the essence of the person. While Alana's preference would have been for an 'in-person' interview, she also accepted that due to the challenges and uncertainty around isolation requirements with Covid-19, online FTF interviews were the next best thing to being in-person, as you can still 'see the person'. De Villiers et al, (2021) also found a similar finding in their study, when in-person FTF interviews were unable to be conducted.

The initial uncertainties presented by Covid-19 and the potential for social distancing requirements, was potentially problematic with conducting in-person FTF interviews. However, it has highlighted how using an online format to conduct FTF interviews is not only a valid way to gather data but can be a preferable option for participants when given the choice. Once Covid-19 isolation restrictions were lifted, participants were offered an opportunity for online or in-person interviews. These later participants chose to be interviewed online and negotiated for these interviews to take place when they were at home during the day. This would suggest that participants felt more comfortable and relaxed being interviewed in their own environment.

There is evidence to suggest that being interviewed at home via an online platform can be challenging if there are interruptions or distractions (Deakin & Wakefield, 2014; Seitz, 2016). Brief interruptions were noted with some of the interviews taking place in the participants' homes. In one of the interviews, the participant's dog began barking (in another room), another participant responded to a phone call during the interview, and in a third situation, the participant was expecting a delivery. In the first situation, the recording continued while the participant attended to their dog. In the second situation, the researcher paused the recording during the phone call, out of respect for the private conversation between the midwife and their client. In the last situation, the participant asked for the interview to be stopped while they attended to the delivery matter and then reconnected afterwards. In each of these situations, the flow of the conversation was interrupted, and therefore there was potential for this interference to have impacted on the integrity of the interview. However, the participants seemed able to pick back up on the discussion with prompting from the researcher.

The first author when reflecting on the interviews noted, that in the first two situations, the participants didn't ask for the recording to be stopped or paused. It appears they had almost forgotten the recordings were taking place. It may be, that due to the 'Covid times', people had become use to connecting online with family and friends while continuing with their normal routines. Or possibly, because the interviews were not taking place in-person, the disruptions seemed less obvious to the participants. For example, had the phone call happened during an in-person interview, the participant may have excused themselves to another location to undertake the conversation, as the researcher would have been physically sitting in the same room as the participant. Lee (2004) noted in their review on the use of recording devices with interviews, that the unobtrusive nature of the tape recorder when used for interviews may serve to desensitize a participant's experience. This could be one explanation for why the

participants seemed unaffected by the online videorecording of the interview, and why pausing of the recording was not asked for by the first two participants in the scenarios described above.

A potential challenge around the functionality of using video technology when conducting online FTF interviews, is the reliance on the connectivity or the internet. Poor internet connections can be problematic in that it can interfere with the flow of the interview and can therefore compromise the quality of the data collection (Deakin & Wakefield, 2014; Hanna & Mwale, 2017; Mirick & Wladkowski, 2019). However, in the online interviews conducted with midwives and pregnant people, this was only an issue in one of the interviews and once the researcher became aware, was able to repeat the question. The video had frozen but not the audio connection. There didn't appear otherwise to have any disruption to the flow, and in fact, it provided the researcher with another opportunity to ask the question and the participant an opportunity to expand further on what they had initially been saying.

Limitations

A limitation of this paper is that the findings and discussion draw on the insights identified by the first author while interviewing participants in phase two of a larger mixed methods multi-phase study. This paper is unable to report actual findings around the participants experiences with being interviewed in an online format. However, they do highlight the potential for further research opportunities around using online platforms for conducting FTF interviews.

One participant chose not to have their video on during the interview. Further exploration around 'camera off' within the context of an interview, could be further explored.

Recommendations

There are two recommendations to be made which support using an online platform when conducting FTF interviews.

1. For participants who may not feel comfortable with in-person FTF interviews, online interviewing offers an opportunity for people to feel comfortable when connecting with a researcher. This is important, as it perhaps provides an explanation for why offering interviews using an online platform are a valid and beneficial way to gather data.

2. Using an online platform for conducting interviews should not be considered a 'poor relation' to in-person FTF interviews, but instead can help contribute towards the growing body of knowledge around online interviewing as a valid research tool that is different from FTF.

Recommendations for further research

This paper highlights the valuable role online platforms offer when conducting FTF interviews. Further research is needed to validate this method which could also help with achieving global environmental and climate goals through reducing the need for extensive travel. This could include:

1. Interviewing researchers on their experiences with using online platforms when conducting in-person interviews.
2. Interviewing participants on their experiences when interviewed by a researcher using an online platform.

Conclusion:

The decision to undertake online interviews FTF via video technology with midwives and pregnant women/people was initially a pragmatic one due to the challenges with the global Covid-19 pandemic and restrictions around in-person contact. However, given the changing landscape with how communication technology is used to enable people to connect, the first author's experiences with conducting FTF interviews via an online platform, highlights the valuable contribution that online platforms offer as a valid research tool. They enable the essence of the person to be captured through responding to visual and auditory cues from the participant and to conduct the interview in a conversational type of manner. The ability to visually lip read what the participant is saying if there were missed words during the recording was valuable in contributing towards the analysis and interpretation of data that was used in phase two of the mixed methods multi-phase study with midwives and pregnant women/people. There is convenience in being able to conduct interviews online FTF from geographically dispersed locations which saves time and resources for both the researcher and participant and helps to contribute towards meeting global environmental goals. While connectivity and disruptions were identified in a few of the interviews, these appeared to have minimal impact.

This paper highlights the valuable contribution that online FTF interviewing can potentially offer when conducting interviews, and to be considered as a valuable option for data

collection alongside in-person FTF interviews. There will always be some people who prefer the in-person experience, however, for others, having the ability to conduct interviews FTF via an online platform is just as effective and in fact may be preferable.

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Chapter 8.1

Enabling connection: Midwives' experiences with using communication technology with their pregnant clients.

Chapter Overview

This chapter presents the findings from interviews with LMC midwives in phase 2A, of the multi-phase study and is presented as a paper under review for publication. The aim of this paper is to report on the first theme 'enabling connection' which was one of three findings from interviews conducted with LMC midwives. As this is a paper under review, reference to previous publications, are indicated as XXXX to ensure anonymity. Ethics approval related to the study was obtained and granted by the Auckland University of Technology Ethics Committee (AUTEC): 20/279 (See Appendix B:1).

The references are presented in this chapter as APA 7th edition, in accordance with the standardised formatting requirement for submission of the thesis through Auckland University of Technology and in accordance with the requirements of the journal in which it was published.

Author contributions

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My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), and Dr Tania Fleming (Secondary Supervisor), involved: preparing and submitting the ethics application, conceptualisation, formal analysis, investigation, and writing of the original paper.

Signed:

Karen Wakelin Date: 7th May 2024

Countersigned: Date: 7th May 2024

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Co-author of paper and Secondary Supervisor: Dr Tania Flemming

Introduction:

Text messages, email, internet and videoconferencing are increasingly being used within healthcare to connect consumers with health professionals (Alianmoghaddam et al., 2019; Dobson et al., 2017; Gasteiger et al., 2019; Gurney et al., 2021; Leahy et al., 2017; McCarthy et al., 2017; K. J. Wakelin et al., 2023). Primarily due to the convenience and efficiency with which messages can be sent and received electronically. The nature of asynchronous communication, such as texting is less intrusive than a phone call, which adds to the efficiency and convenience when maintaining connections to people, without having to reply immediately (Goldfarb et al., 2016; Leahy et al., 2017). This convenience and efficiency with using communication technology has resulted from mobile devices being carried on the person. This however comes with, an expectation, that the response will be instantaneous, mimicking face-to-face responses with the immediate and reciprocal exchanges that take place between the people texting (Gunraj et al., 2016). This is often referred to as k-synchronous (where asynchronous communication is treated synchronously) (Robinson & Stubberud, 2012).

The efficiency and convenience of communication technology is not just limited to communication between two people, but also in the ability to store and access health information electronically. The ability to share health information via electronic health systems or client portals serves two purposes, one in enabling health professionals to upload information and document directly into the electronic notes system and secondly, to enable consumers of health services access to their information (Elers & Nelson, 2018; McBeth, 2021). Health professionals have an ability to send electronic referrals, prescriptions or access notes, which all lends itself towards a streamlining approach to healthcare for consumers who are accessing these services (Elers & Nelson, 2018; Laukka et al., 2020). Within Aotearoa New Zealand (NZ), patient or client portals have been established by general practitioner practices as well as maternity provider organisations (Expect, n.d.; Manatū Hauora|Ministry of Health, 2021). The convenience with these applications is they can be used on mobile devices, with information able to be sync'd to cloud base storage.

The convenience and flexibility with offering online health services have been further shown in the increasing numbers of Telehealth care services that have been set up in NZ (Manatū Hauora|Ministry of Health, 2021). These were established to enable consumers to access a health professional particularly if they live in rural location, in response to the global Covid-19 pandemic, where in-person face-to-face contact was minimised due to isolation rules and due to the difficulty in finding a health care professional.

The flexibility with which communication technology can be used particularly within maternity care, has implications for midwives and pregnant women/people, particularly in relation to information sharing and ensuring access for pregnant people. Effective communication practices are an essential and key element in providing women/person centred care within the continuity of care model of midwifery practice in NZ (New Zealand College of Midwives, 2015). Communication was also identified as a key component within the Quality Maternal and Newborn Care (QMNC) framework developed by leading midwifery researchers (Renfrew et al., 2014).

In phase 1 of a study undertaken by the authors, effective communication technology practices were shown to enhance and support the relationships that midwives develop with their pregnant clients by ensuring pregnant women/people were able to connect and have access to their midwife while at the same time, enabling midwives to use their time efficiently (XXXX 20XX). What is less clear, is how this connection is enabled and therefore how it contributes towards quality maternal and newborn care. This is the focus of interviews with midwives in this second phase of a multi-phase study.

Aim:

The aim of this paper is to report on the findings from interviews with lead maternity carer (LMC) midwives on how communication technology is used with pregnant clients. Three themes were identified from the study: 1) enabling connection, 2) facilitating quality care, and 3) finding balance. This article will report and discuss the findings from the first theme: enabling connection. The findings from the other two themes have been submitted as separate publications.

Methods:

This study reports on the findings from phase 2A of a multi-phase study. The multi-phase sequential transformative design uses a theoretical framework to guide the study with data collected from one phase informing the data collected from another phase (Teddlie & Tashakkori, 2009). The guiding framework for this multi-phase study is the Quality Maternal and Newborn Care (QMNC) framework (Renfrew et al., 2014). Questions for the semi-structured interviews were informed by the findings from an online survey with LMC midwives in phase 1A of the multi-phase study. A pragmatic decision was made to collect data via face-to-face online interviews due to the challenges with the global Covid-19 pandemic and potential restrictions around in-person contact during the time the study took place.

In phase 2A, data was collected via online interviews with LMC midwives using the online platform Microsoft TEAMS. The first author was familiar with using Teams as this is a platform that is used daily within their workplace as a midwifery educator. Hanna and Mwale (2017) comment on the importance of knowing and being familiar with your software prior to undertaking an online interview, so this familiarity was important when considering which online platform to use. The online interviews took between 40-60 minutes.

Piloting the online interview is recommended to ensure there aren't any technical difficulties with the software (L. M. Gray et al., 2020). The interview questions and recording through Teams was piloted through interviewing a midwifery colleague (who had not taken part in either the online survey or online interview). Piloting the online interview in this way meant the first author was able to see 'behind the scenes', what happened with the recording and to download and save the recording to the password protected computer. The transcription service within Teams was helpful however, it did require the researcher to go through listening carefully and amending words as accent and unfamiliar words such as the occasional use of Te Reo Māori were not transcribed accurately. Following this piloted interview, the researcher felt comfortable that this would be an efficient way to record the online interviews. The interviews were transcribed by the first author and returned to participants to ensure accuracy of the recorded interview within one week of the interview taking place. Ethical approval for the study was granted by XXXX Ethics Committee (XX 20/279).

Setting

Online interviews took part using Microsoft Teams with lead maternity carer midwives in NZ from September – October 2022.

Participants

In phase 2A, midwives who had previously undertaken an online survey in phase 1A and had expressed interest in participating further in an online interview, were provided a separate link as part of the last question on the survey where they could provide their contact details. Initially 33 midwives indicated they would be happy to take part in a further interview. The first author emailed the midwives, with fourteen responding to the email invitation. It is unclear why the remaining midwives did not respond; however, 12 months had passed from the initial online survey in phase 1A so it may be that midwives were either no longer practising or were not able to take part. The fourteen midwives who agreed to take part in a further interview were representative of the current midwifery workforce in average age, ethnicity, location and

years of experience as an LMC midwife (Midwifery Council |Te Tatau o te Whare Kahu, 2021). A further email was then sent to the participants with information regarding the platform to be used, how to connect along with attachments of the participant information form and consent form. A day and time for the online interview was then negotiated. Midwives had already met the criteria by participating in phase 1A of the study.

Criteria included:

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

Analysis of data

Thematic analysis was used to analyse the data from the semi-structured interviews with LMC midwives. Braun & Clarke (2022), identify a six-step process for undertaking analysis which includes 1) familiarisation with data, 2) coding, 3) generation of initial themes, 4) developing and reviewing themes, 5) refining, defining and naming themes and 6) writing up.

Analysis of the interviews was undertaken by the first author, however, during each phase as outlined below, regular meetings were held with the other two authors (who were also the first author's supervisors) to discuss the coding and development of themes.
During the familiarisation phase, transcribing the interviews by the first author enabled the author to fully immerse themselves in the interview. The video recording enabled visual cues to be identified. Once interviews were transcribed and returned from the participants, a first read through enabled initial thoughts to be identified through comments made in comment boxes. The interviews were then read through again and colour coded for similarity of data.
Braun and Clarke (2022), recommend using a coding table to help make sense of the data. A coding table was created using an excel spreadsheet to capture segments of data and the coded description. This was also found to be an efficient way to move across large collections of data with each coded category having their own page. Forty code categories were identified from the coding descriptions during this phase. In the third phase of the analysis process, the coded categories were reviewed against the research questions. A series of mind maps were undertaken which resulted in preliminary themes. In phase four, potential themes and sub themes were developed and reviewed. Quotes from midwives were incorporated into the themes and sub-themes and reviewed again. In the fifth phase, the themes and sub-themes

were refined and then emailed through to the first authors supervisors for review. Because the other authors had not been intently involved in the coding process, they were able to bring a more critical approach to the process which helped to ensure the themes and data segments were valid and representative of the midwives' experiences. The themes and sub-themes were refined further following comments until the researchers felt the themes were reflective of the data. Table 1 outlines the development of themes.

Table 1: Development of themes

Enabling Connection	Enabling connection through giving space and distance	Time to consider messages and respond.	*"They text questions because they can communicate better and then they can take their time to understand the reply. It's like a table we both eat at. I can put the offering on the table, and they can take their time to consume it and really assimilate it" (Linda).*
		Provides opportunity to ask questions non-face-to-face	*"And the benefit is I'll get more communication from women that might not ever ask you anything or engage with you because if they had to call you, they wouldn't. You're more relatable if you're able to communicate via a medium in which they feel comfortable. In being relatable means you're approachable, and that's what you wanna be" (Sarah).*
		Enabling connection while giving space during early pregnancy loss.	*"But sometimes I actually think that's why they say, ohh that's fine, we can talk on the phone. You don't need to come because I don't think that they are particularly at that point in their journey, you've only met them once or twice. So, like you haven't got that same relationship with them. And so, I think they almost want to be protected from you seeing them like this" (Renee).*
	Enabling connection through flexibility	Setting up autoreplies in response to text messages.	*"People will send something off and expect an immediate response and that's where the auto response comes in. I couldn't live without it now because people get an immediate response. It reminds then I do still get that" (Adrianne).*
		Variety of platforms for information sharing	*"I've got a save file on my phone with different links for different things that I'll send and then they can go and have a look or watch YouTube videos or PDF link so that they can read it themselves…" (Renee).*
		Ability to share information with colleagues	*"I'd ask if I could share a photo with my colleagues to see if anyone had, anything else they could add. It worked well for us. We could share information,*

			if need be, to get a better outcome. A better answer maybe (Dengar).

Findings

In phase 2A, of the mixed methods multi-phase study, LMC midwives were interviewed to explore how they used communication technology to connect with their clients and how communication technology was used to ensure quality maternal and newborn care.

Enabling connection

The theme enabling connection was identified by the way communication technology enabled midwives to connect with their pregnant clients. These connections happened in two ways; firstly, through space and distance and secondly through the flexibility and convenience of the technology itself in ensuring midwives were accessible to their clients.

Enabling connection through giving space and distance

One of the main benefits with communication technology, particularly asynchronous communication, is enabling connection through space and distance. This juxtaposition occurs due to the nature of the asynchronous communication, where communication is not occurring in real time. Midwives identified that texting or emailing gave them space and distance to consider information before responding to their clients, as well as providing clients with space to consider responses by their midwife. This space was important in enabling midwives to work within different contexts depending on the situation.

> *"It was good having people being able to e-mail me for non-urgent things. Just that I could like kind of take the time to reply" (Bella).*
>
> *"They text questions because they can communicate better and then they can take their time to understand the reply. It's like a table we both eat at. I can put the offering on the table, and they can take their time to consume it and really assimilate it" (Linda).*

Midwives recognised that there were times when their clients may not be able to respond to them or speak with them. In these situations, texting provided an opportunity for midwives to maintain connections, to let their clients know they were there while also giving them the space they needed.

> *"She didn't answer the phone, so I just left a message...So I feel that's sometimes important not to talk to people because they need that barrier or space" (Denise).*

LMC midwives in this study provided continuity of care to their clients and so had developed a relationship with their clients over many months. Despite this, the asynchronous nature of

communication technology enabled pregnant clients to contact their midwife and ask questions that they otherwise may not have been able to do via phone or when face-to-face.

> *"And the benefit is I'll get more communication from women that might not ever ask you anything or engage with you because if they had to call you, they wouldn't. You're more relatable if you're able to communicate via a medium in which they feel comfortable. In being relatable means you're approachable, and that's what you wanna be" (Sarah).*

The distance provided in non-face-to-face communication was also beneficial in enabling midwives and their clients to connect when working through grief and loss. Renee explains this when communicating with a pregnant client who experienced an early pregnancy loss. The distance provided a protective barrier from dealing with the raw emotion. In this situation, the midwife took their clients lead, as 'face-to-face' was too confronting, and they needed space to work through their grief, while taking on board the information the midwife was sharing with them.

> *"But sometimes I actually think that's why they say, ohh that's fine, we can talk on the phone. You don't need to come because I don't think that they are particularly at that point in their journey, you've only met them once or twice. So, you haven't got that same relationship with them. And so, I think they almost want to be protected from you seeing them like this" (Renee).*

There also appeared to be recognition that texting enabled connections and contributed towards a relationship of trust by what the midwife describes as 'relationship banter'. It's not always about the clinical information that is shared, but the space to communicate without the intensity of a synchronous communication.

> *"There's a little bit of relationship banter that keeps, women feeling supported, but me not having to spend a lot of labour-intensive time on the phone" (Kelly).*

Communication technology would appear to be beneficial in enabling space and distance between the midwife and pregnant woman/person when communicating in non-face-to-face situations. With asynchronous communication, there is time to consider and respond to messages. A phone call was also just as beneficial in providing distance for a client to work through their grief. Giving space would appear to be an important aspect of the communication technology which is enabled through the flexibility of the technology itself.

Enabling connection through flexibility

The flexibility of the technology itself enables midwives to share information, seek clarification or offer referrals in a convenient or efficient manner. The potential for use in emergency situations is highlighted by the way the technology is used to make connections with colleagues or get help.

The flexibility of communication technology provided opportunities for the midwife to share information using a variety of platforms depending on the situation in an efficient way. There was recognition by midwives of the importance for pregnant women/people to have access to this information, not only for themselves but so they can easily share it with others.

> *"I've got a save file on my phone with different links for different things that I'll send and then they can go and have a look or watch YouTube videos or PDF link so that they can read it themselves... and then it's up to them if they're going to take it and use it. Plus, it means that they can share it, to their partner or whatever they need to as well" (Renee).*

> *"I'll get the results through for the MSS1 and I process it on the system then I'm messaging them at the same time. Just a heads up your results back and it's fine, and it's on the portal. It's quick, it's easy and if they want more information. They can go and have a look" (Denise).*

Linda highlights how communication devices such as a smart phone can also be a useful tool for capturing teaching moments when sharing information with clients during an antenatal appointment.

> *"I have lots of visual aids on my phone. So, when I'm explaining a concept like cervical dilatation, I'll pull up my picture that shows an undilated cervix with the baby sitting there and then what it looks like when it's open" (Linda).*

Midwives highlighted the flexibility of the technology in enabling autoreplies or responses to text or phone messages. Midwives are not always able to answer or respond immediately so an auto reply can do this instead. Midwives can set up their replies reminding their clients to call if urgent, or who to call if they are away. This connection enables reassurance and acknowledgement that the person's message has been received and will be acted on.

> *"People will send something off and expect an immediate response and that's where the auto response comes in. I couldn't live without it now because people get an immediate response. It reminds then I do still get that" (Adrianne).*

> *"I've got one that automatically comes up out of hours. I don't need to remember to put it on if I'm physically off and there's somebody covering me, there's a text about that and the number of who to call. It's all pre-programmed" (Linda).*

The flexibility in being able to share information such as a photo with midwifery or obstetric colleagues identifies the community of practice which has developed around using communication technology in this way. Midwives highlighted examples where they were able to seek clarification from midwifery colleagues to help with informing decisions around care with their client. There was also recognition of the convenience for midwives to be able to consult with a medical colleague by sharing information through a photo. This ultimately meant the client was able to access the necessary care needed without physically having an in-person face-to-face consultation, saving them time and travel.

> *"I'd ask if I could share a photo with my colleagues to see if anyone had, anything else they could add. It worked well for us. We could share information, if need be, to get a better outcome. A better answer maybe (Dengar).*

> *"She'd sent a message and I said, do you mind if I flick this through to our obstetrician on call and she's like, no, that's fine. And I messaged it through to him. And then he rung. When I told him the clinical thing he was sitting at the computer, 'I'll flick her through a script cause she needs some antibiotics', and she was happy because she didn't have to come into the hospital to be checked and she got antibiotics and it was sorted" (Renee).*

The flexibility with how communication technology can be used particularly in a rural environment in an emergency where the midwife might otherwise be working in isolation, meant that virtual face-to-face connections with colleagues could happen in real time, to support the midwife.

> *"And when we have an emergency at home, we'll FaceTime with the obstetric team to show them what's going on real time. So now we have somebody else in the room with us... to be able to Face Time in an emergency if it's appropriate, has been a game changer, because suddenly you're not alone" (Linda).*

Midwives highlighted the convenience and flexibility with using communication technology particularly when using electronic notes with documentation. The electronic notes system could be set up by the midwife to efficiently assist them with tailoring the information shared based on the person's gestation or needs.

> *"I have auto text within my programme. So, when I'm doing antenatal notes, I can tick that we've discussed, and it populates a couple of sentences about what we've discussed as well as within the care plan. It'll have more links to specific websites for more information" (Adrianne).*

> *"I set, how I do my documentation and the portal notes that I use as my IT system. It's structured and flexible, to whatever they need. It has a bunch of links per gestation period, so 18 to 22 weeks, there will be information that I'll text in that period for the antenatal" (Kelly).*

However, while client portals were set up by midwives for their clients to use, not all used this function, due to the client portal from maternity notes not integrating with client portals established by doctor's practices. This led to confusion for some pregnant people especially when trying to access results from blood tests offered by their midwife.

> *"There's the software for using maternity notes and there's a client portal so it is similar to 'Manage my Health' [General Practice patient portal]. People can sign up for their own client portal and it means they can access their notes… but to be honest, people didn't really use it that much. They would always be asking about their blood results… most people just sort of forgot, whereas Manage my Health it's sort of in the mainstream, everyone knows about it" (Bella).*

While the electronic portals were a way for enabling further connections between the midwife and their clients, there was recognition around the limitations and lack of flexibility when various portals do not interface with other health systems.

The flexibility around documentation meant that midwives could upload or take screenshots of text messages to add to the clients' electronic notes to support information they have shared. It also provided proof of information shared in case midwives needed to refer to this information later or in case there were complaints made against the midwife.

> *"I will screenshot and then upload it as an attachment to the notes…I don't delete any of my texts. So, there's thousands. Women have sent me videos through WhatsApp and again, they're just there. I don't want to delete something that I may need some time later" (Kelly).*

> *"I've got a lot of clients that just don't want to do anything, I will send it by text so that if it goes further, I've got that proof" (Jordan).*

While texting is considered an asynchronous mode of communication, Linda highlights just how valuable and flexible the technology can be in enabling a parallel conversation in real time to occur via text whilst having a completely different verbal conversation.

> *"I went to a young girl's house. There was clearly an adult male asleep with the baby just offside and she's very heavily pregnant and she's talking away, but she's typing on her phone and what she held up on her phone was. He's beaten me really badly. I'm worried about the baby and the light was so dark, I couldn't even see that her face was bruised. So, we had this conversation while we were texting each other. Quite*

impressive...So, for her, having her phone, was our way of having a completely subtext conversation for her safety and for my safety. He was big, big fit man" (Linda).

Midwives appear to have taken on board the flexibility with which communication technology can be used to ensure their pregnant clients can not only connect with them, but to ensure they have access to care. Communication technology is more than just a platform used to communicate one-to-one. The ability to share information via links, to upload or take screenshots of messages to form part of documentation or communicate in a parallel conversation is an all-encompassing way of how the technology enables a flexible way for midwives and their pregnant clients to connect.

Discussion

The discussion focuses on the theme 'enabling connection' which highlights how communication technology enables connections through space and through the flexibility of the technology itself.

The space in-between

The midwives in this study have identified the importance of 'space and distance' when connecting with their pregnant clients. It is a balancing act which requires subtleties and knowing when and how to connect and respond in an appropriate manner. Victor Frankl sums this up with his quote: *"between stimulus and response there is a space. In that space is our power to choose our response. In our response lies our growth and freedom"* (Frankl, n.d.). This space provided by communication technology was recognised by midwives in this study both from their own perspectives, when receiving a message, and having time to consider how they responded to their clients, as well as for the pregnant people themselves, in having space to ask questions they might not feel comfortable asking face-to-face. This space provides an emotional connection which involves the midwife thinking about the person and thereby choosing how they respond to them. There wasn't necessarily an expectation around when a response was required, but it was recognised that the technology enabled this space to occur which Linda identified when she comments that '*It's like a table we both eat at. You know, I can put the offering on the table, and they can take their time to consume it and really assimilate it".* This implies that asynchronous communication has an integral part to play in enabling a connection to occur between the midwife and the pregnant woman/person, whilst at the same time, giving space and distance to the communication, and giving space to consider a response. It doesn't require an immediate response, in fact quite the contrary, it provides space to give a

considered and more informed response which is achieved through having time, and distance. Further to this, it is not considered a one-way interaction, but both the midwife and pregnant person are equally invested in the communication transaction.

An ability to be both present and distant at the same time is often referred to as being co-present. Co-presence is a concept that has been identified in relation to the space and distance which occurs particularly when someone is connecting without physically being present in the same room as the person (Haddouk, 2015). Haddouk (2015), discuss the notion of being co-present which indicates the emotional or psychological connection that a person may have with someone else who is not physically in the same space as them. This feeling of connection would appear to also provide some emotional reassurance that the person is not alone, as was the case for the midwife when connecting virtually with an obstetric colleague while managing an emergency at a client's home. The importance of the midwife in being able to connect virtually with an obstetric colleague not only helped with providing the midwife with information for managing the situation, but it gave the midwife reassurance of being connected and not alone. There was someone else that was able to virtually see what was going on and provide assistance, in a co-present kind of way.

While co-present seems to fit well with a virtual connection, the concept of 'absent presence' has been aligned with asynchronous communication (Gergen, 2002). Gergen comments than in asynchronous communication, 'the present is virtually eradicated by a dominating absence' (2002, p. 231). This would seem to imply, that as this type of communication is used more frequently, the connection that is made by being present with someone in-person is being overtaken by not being present. Milligan & Wiles (2010), discuss this concept around landscapes of care, where they draw on the emotional connection in relation to proximity and distance. They comment that despite being distant from someone, there is an emotional connection which brings a certain closeness to the person. It is this aspect of proximity and distance, that the midwives seem to allude to with respect to the space that is given between the sending and receiving of a text message. Communication technology provided the space for respectful considered connections to take place. It is the space in between that means so much more, and contains so much more, than a just a gap between two messages.

Flexibility to connect

For the midwives in this study, communication technology provided flexibility around how the technology can be used with their pregnant clients. The ability to share photos and information with midwifery or obstetric colleagues identified the flexibility and convenience in enabling a community of practice around how clients can at a distance, access the necessary care they

might need. Telehealth, which provides a flexible way for people to connect with health professionals is often cited as a way for improving access to healthcare particularly in rural or remote areas where access to health care would otherwise be very difficult or non-existent (Lupton & Maslen, 2017). While Telehealth offers an opportunity for a virtual face-to-face appointment between a client and another health professional, what the midwives in this study seemed to suggest, was something different. They identified the convenience and benefit in being able to share and discuss a photo with a medical colleague which resulted in their client accessing care and importantly in this situation, medication without the need for costly travel. So, in effect, acting as a conduit between their client and the obstetrician. This wasn't done as a way of gatekeeping, but in assisting their client with a quick response to a concern that was raised.

The flexibility of communication technology around documentation was highlighted by midwives in this study in several ways. Information sharing and education is an important part of the midwife's role with their antenatal clients. Having the ability to efficiently share information via links, pre-populate electronic notes or upload results to a client portal enabled the midwife to work in a more efficient manner, as well as tailor a response to the person's needs. While tailoring and individualising care is an important component of the QMNC framework (Renfrew et al., 2014), this ability to use the technology in this way highlights how communication can contribute towards enabling quality care. There is a challenge however, when different electronic health systems do not integrate with one another which can lead to confusion for pregnant women/people if they are unsure for instance where to access results. People are becoming more comfortable accessing their results through general practitioner patient portals (Elers & Nelson, 2018), however, when midwives order bloods or scans, these results will only be accessible through maternity client portals or electronic health systems. Another area where lack of integration between electronic health systems is evident and potentially problematic is the non-interfacing of systems between community and hospital systems. Of the three maternity electronic health systems in NZ, only one currently enables real time documenting of clinical care in both the hospital and community (McBeth, 2021). The other systems are primarily community based and do not interface with the hospital system. This study highlights the need for interfacing health systems particularly when LMC midwives are working across community and hospital settings to enable better access, connections and sharing of information, and is an area that would benefit from further work.

The flexibility to set up auto responses was considered a gamechanger for many of the midwives in this study. Having the ability to pre-programme a response which would

automatically be sent to clients provided a connection and acknowledgement to the pregnant woman/person that their message had been received, as well as provide prescriptive information on what to do if there were urgent concerns. Jain et al. (2019), have undertaken work around modelling responses and found that the right response, can help put the sender of the message at ease. We would argue that it not only provides reassurance for the receiver of the message, but for the midwives themselves.

Having an ability to communicate using two different modes of communication at the same time highlights the incredible ability for young people to multi-task and was a real revelation for the authors in this study. Not only, does it provide insight into the skills needed to text and speak at the same time, but it meant that the young woman (in this situation) was able to alert the midwife to a precarious situation and thus ensure safe care for both her and the midwife.

Strengths and Limitations

A strength of this study is in the mixed methods multi-phase design which enables further exploration of issues that had been identified in the first phase of the study. The fourteen midwives who participated in this phase of the study had previously taken part in an online survey. The midwives were therefore able to provide valuable insights into how communication technology enables midwives to connect with their pregnant clients.

A limitation to this study is recognised in presenting only one of the themes identified from the overall study. It was felt however, that to try and condense all the findings into one article may lose some of the valuable information and context shared by midwives of their experiences with using communication technology with their pregnant clients. A further limitation is identified in focussing solely on how LMC midwives used communication technology with their pregnant clients. It is unknown whether the experiences identified by midwives in our study are similar to other community-based midwives aligned with hospitals, or whether there are different issues for midwives when connecting with labouring or postnatal clients. The issues identified by midwives, however, have highlighted further research opportunities particularly around the need for an integrated electronic health system.

Conclusion

Communication technology facilitates quality care. It does this in two ways. Firstly, by enabling an emotional connection through space and distance which provides the midwife and pregnant woman/person time to consider and choose how to respond. Secondly, the technology offers innovative and flexible ways to assist with individualising responses, sharing

information with other health professionals to inform clinical decision making, and enabling access to safe care for pregnant women/people and midwives. It further contributes towards the developing knowledge around Telehealth interactions. Midwives in our study have embraced communication technology and shown how it can be used to ensure pregnant women/people are able to connect and access quality care.

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Chapter 8.2

Communication technology facilitates quality care through a continuity of care relationship: Midwives' experiences with using communication technology with their pregnant clients.

Chapter Overview

This chapter presents the findings from interviews with LMC midwives in phase 2A, of the multi-phase study and is presented as a paper which has been accepted for publication. The aim of this paper is to report on the second theme 'facilitating quality care' which was one of three findings from interviews conducted with LMC midwives. Ethics approval related to the study was obtained and granted by the Auckland University of Technology Ethics Committee (AUTEC): 20/279 (See Appendix B:1).

The references are presented in this chapter as APA 7th edition, in accordance with the standardised formatting requirement for submission of the thesis through Auckland University of Technology and in accordance with the requirements of the journal in which it was published.

Author contributions

The co-authored paper has been accepted for publication. The proposed bibliographic details of this co-authored paper are:

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My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), and Dr Tania Fleming (Secondary Supervisor), involved: preparing and submitting the ethics application, conceptualisation, formal analysis, investigation, and writing of the original paper.

Signed:

Karen Wakelin Date: 7th May 2024

Countersigned: Date: 7th May 2024

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Introduction

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 used a multi-methods approach which incorporated synthesising findings from systematic reviews of women's perspectives and experiences of maternity care. Findings showed that when care was provided in an individualised and respectful manner, women felt strengthened and empowered. Their findings align with the midwifery model of continuity of care which is the cornerstone of midwifery care within Aotearoa New Zealand (NZ) which came about with the passing of the Nurses Amendment Act 1990 which returned autonomy to midwives enabling them to practice in any setting be that hospital or community without the supervision of a medical practitioner (Department of Health, 1990). Since that time, midwives have been providing care to childbearing women/people from early pregnancy, during labour and birth and up to six weeks postnatally following the birth of the baby (Te Tatau o te Whare Kahu|Midwifery Council, n.d.-b).

Communication is an important part of the relationship that midwives develop with their clients, and none more so, than with the increasing and ever adapting ways in which people use communication technology to connect with one another. Ever since the first text message was sent in 1992 (Kleinman, 2022) the way society communicates and connects with one another has evolved. In 2019, 88% of New Zealand's population were active internet users, with 92% of the population having access to a mobile phone (New Zealand Health and Disability System Review, 2019). Connecting and communicating in this way has therefore changed the landscape of communication which prior to this, was either in-person face to face, speaking over the phone or in written form such as a letter.

While access to internet or mobile services are available to a vast majority of the population within NZ, there are still pockets, where access is challenging due to geographical locations, or financial inequities (Crowther & Smythe, 2016; McAra-Couper et al., 2020; New Zealand Health and Disability System Review, 2019; White et al., 2019). Further to these challenges, potential issues of safety were identified in a recent survey undertaken in NZ, where Lead Maternity Carer (LMC) midwives were concerned with inappropriate use of text messages when pregnant women/people text them for urgent concerns (K. J. Wakelin et al., 2023).

There is evidence to support the beneficial effects when providing midwifery continuity of care (Sandall et al., 2016). Bradford et al. (2022) undertook a review of midwifery-led continuity of care models and acknowledged there were difficulties identifying specifically what elements are beneficial to recipients of care due to the complex nature with which continuity of care was being provided. From this position, the use of communication technology within a midwifery continuity of care model will be explored in phase two of a multi-phase study to determine how communication technology contributes towards effective communication and therefore towards quality maternal care.

In phase 1 of a study undertaken by the authors, effective communication technology practices were shown to enhance and support the relationships that midwives develop with their pregnant clients by ensuring pregnant women/people were able to connect and have access to their midwife while at the same time, enabling midwives to use their time efficiently (K. J. Wakelin et al., 2023). Understanding how communication technology contributes towards quality maternal and new-born care within a midwifery continuity of care relationship is less clear and is the focus of interviews with midwives in the second phase of a multi-phase study.

Aim:

The aim of this study is to show the valuable role communication technology plays in contributing towards quality maternal care when used within a midwifery model of continuity of care. This is highlighted through interviews conducted with lead maternity carer (LMC) midwives to explore how they use communication technology with their pregnant clients.

Methods:

This study reports on the findings from semi-structured interviews with lead maternity carer midwives in phase 2A of a mixed methods multi-phase sequential transformative design which uses a theoretical framework to guide the study (Teddlie & Tashakkori, 2009). The QMNC framework is the guiding framework for this multi-phase study (Renfrew et al., 2014). A qualitative descriptive approach has been taken for this phase as it enables participants to describe their experiences with findings situated close to the data (Sandelowski, 2010). As such, it is ideal for exploring further with midwives, their experiences with using communication technology with their pregnant clients and to additionally enable a deeper dive into some of the issues that were identified from the survey in phase one of the mixed methods multi-phase study. For this reason, it is often used within mixed methods studies to

help explain or explore further quantitative findings (Doyle et al., 2020). Further to this, a qualitative descriptive approach can contribute towards quality improvements within clinical settings (Chafe, 2017). This therefore aligns with using the QMNC framework as the theoretical framework for our study which explores how communication technology contributes towards quality maternal care.

Questions for the semi-structured interviews were informed by the findings from an online survey with LMC midwives in phase 1A of the study. Table 1 outlines an example of the indicative questions used in the interviews.

Table 1: Questions to inform semi-structured interviews with LMC Midwives

Findings from the online survey with LMC midwives indicated that Wi-Fi can be problematic. • How do you negotiate contact with your pregnant clients when this is the case? • What strategies do you use if you are out of 'cell phone' or 'Wi-Fi' coverage?
How do you use communication technology in your day-to-day practice? • Do you use communication technology to reinforce information shared or to provide health messages? • Do pregnant clients share information with you outside of scheduled appointments?
What have been some of the main concerns for you when using communication technology to connect with your pregnant clients?
Can you tell me how you have managed concerns if pregnant clients contact you in a way you deem to be inappropriate?
How have you used communication technology to sustain yourself in practice? Are there some platforms that work better for you than others?
Do you have any concerns around privacy or confidentiality of information if shared over online platforms? Do you use security protection measures with your communication devices?
Have you needed to adapt the way you contact your pregnant clients?

Semi-structured interviews were conducted using Microsoft Teams, with interviews taking between 40-60 minutes. Ethical approval for the study was granted by Auckland University of Technology Ethics Committee (AUTEC 20/279).

Setting

Online interviews took part using Microsoft Teams with lead maternity carer midwives in NZ from September – October 2022.

Participants

In phase 2A, fourteen LMC midwives who had completed an online survey in phase 1 of the study had expressed an interest in participating further in online interviews. (Midwives who

were happy to take part in interviews were asked a final question in the online survey which would take them to another link where they could provide their contact details). Midwives were then emailed a participant information form outlining the purpose of phase two of the research, the process for participation and withdrawal, how privacy will be protected, dissemination of results from research and contact details if participants had further questions. Further information was emailed on how participants connect to the online platform, and the consent form. All fourteen midwives agreed to be interviewed. A day and time for the interview was then negotiated.

Ensuring trustworthiness of data

There are various terms used to describe the trustworthiness or rigor required of qualitative research. Lincoln and Guba refer to credibility, transferability, dependability and confirmability as four general criteria used to ensure trustworthiness of qualitative research (Stahl & King, 2020) while Morse (2015) refers to reliability, validity and generalizability. The development of the questions for the semi-structured interviews were informed from the findings form the survey with midwives in phase one of the study (K. J. Wakelin et al., 2023). The transcripts were initially returned to participants for member checking before commencing analysis of data (credibility). In determining transferability and dependability of the research, a methodical process for data analysis was then followed using Braun and Clarke's six step process for undertaking thematic analysis (see below) (Braun & Clarke, 2022). The coding of data was undertaken by the first author which provided consistency when applying colour codes to data segments from each of the interviews (reliability). The interview transcripts and recordings were reviewed several times to ensure familiarisation. The ability to review the recordings enabled the first author to pick up on non-verbal cues to assist with the interpretation of the data. The other two authors had not been involved with the coding of data and therefore were able to bring a 'fresh eyes' approach to ensure the codes, themes and participant quotes were valid. The transferability of findings across other areas of health may not be completely applicable given the nature of the continuity of midwifery model of care used within NZ, however, it provides valuable insight into issues that were experienced by the midwives in our study that maybe applicable to other areas and models of care.

Analysis of data

Analysis of the data was undertaken using a six-step process as outlined by Braun & Clarke (2022). This process involves 1) familiarisation, 2) coding, 3) generation of initial themes, 4)

developing and reviewing themes, 5) refining, defining and naming themes and 6) writing up. Transcribing of the interviews was undertaken by the first author as part of the familiarisation phase as this enabled a re-immersion into the interview. Once the interviews were transcribed, they were returned to participants as member checking to ensure accuracy. All participants returned the interview transcripts, with only one interview requiring minor changes to wording. In the second step, the first author re-read the transcripts and reviewed the video recording of the interview several times to gain familiarity with the data. The interview transcripts were then colour coded depending on similarity. In step three, a coding table was created using an Excel spreadsheet. This enabled the colour coded segments of data to be tabled in one place and made it easier to review large amounts of data, which was required for generating themes as part of step four. Once initial themes were generated, the first author provided examples of code descriptions, data, and provisional themes to be reviewed and critiqued by the other two authors (who were the first author's supervisors). This formed step 5 of the thematic analysis process. The themes were reviewed again, and refined further until the final themes and sub-themes were identified and deemed to be reflective of the data, before writing up began. Table 2 outlines the development of themes.

Table 2: Development of themes

Communication technology facilitates quality care through a continuity of care relationship	Connectedness and being known	Adapting to communication	*"The benefit is that you're with women you know. You have to move with the times and embrace the technology. It means that you understand the world that your clients live in now and you can communicate with them on the same sort of level, which is nice, you're not so much of a dinosaur" (Barbara).*
		Establishing respectful communications	*"I always felt if you respect their time, they generally respect yours, whether it's a communication or, whatever..." (Ruby)*
			"People are very mindful; they seem to be very respectful of home time and often in a text would apologise for contacting at the weekends" (Barbara).
		Negotiating safe and appropriate means of contact	*"Well, part of our setup when I do my booking visit is to establish how we're going to communicate because there are times where it's completely inappropriate to text me.." (Linda).*
	Awareness of challenges- strategies for	Financial challenges or inequities	*"We have an 0800 number ...and then they can press the option of which midwife they want to talk to" (Amy).*

	ensuring quality care		*"Messenger has made it a lot more accessible...just go up to McDonalds or something" (Ruby).*
		Internet/cell phone coverage challenges	*"If I know that I'm going somewhere where it won't be a signal, then I'll just divert my phone temporarily while I'm out to one of my colleagues…" (Renee)*
			"I'll use my phone to make a better hotspot so then I can run my computer to do the notes, but obviously, it chews through your data" (Sarah).

Findings

In phase 2A, of the mixed methods multi-phase study, LMC midwives were interviewed to explore how they used communication technology to connect with their clients and how communication technology was used to ensure quality maternal care. The socio-demographic details of participants were consistent with the national midwifery workforce data in relation to average age of participants, ethnicity, location (covering urban, rural and remote rural) and years spent in LMC midwifery practice (Te Tatau o te Whare Kahu|Midwifery Council, 2021).

Facilitating quality care

Communication technology was shown to facilitate quality care in two ways; 1) connectedness and being known and 2) development of strategies for ensuring quality care. The continuity of care relationship enabled midwives to readily provide recommendations on how communication technology could be improved upon to ensure safe communication and connections for their clients when accessing midwifery care.

Connectedness and being known

Adapting to communication

The importance of the continuity of care relationship is the knowingness of the person that develops over the continuum of the relationship. Midwives are invested in this relationship which is shown through recognising their need to adapt and use technology to ensure they were connecting and relating to their clients in a manner that would meet the needs of their clients.

> *"The benefit is that you're with women you know. You have to move with the times and embrace the technology. It means that you understand the world that your clients live*

in now and you can communicate with them on the same sort of level, which is nice, you're not so much of a dinosaur" (Barbara).

"Women want to communicate in different ways and because now we're so into texting or social media, they are more comfortable with texting. The benefit is I'll get more communication from women that might not, ever ask you anything, or engage with you because if they had to call you, they wouldn't. They'll more often text and relate to you. You're more relatable if you're able to communicate via a medium in which they feel comfortable. In being relatable means you're approachable, and that's what you wanna be" (Sarah).

These connections occurred even if it meant midwives communicated through texting when a phone call or face-to face would be preferable for them. Midwives recognised the importance of the knowingness that came through the continuity of the relationship and in maintaining connections.

"A lot of my clients are young people. So, it's very much the vernacular that I have to work in now and where I would like to have a face-to-face chat or a phone call. The reality is, is everybody texts or messages and I have to follow suit (Linda).

Further to this, it would seem it is the knowingness that is developed through the continuity of care relationship that pregnant people then feel they can text or communicate with their midwife at any time. Knowing the person and understanding the importance that a response would make is in part why some midwives chose to respond out of hours, or in Barbara's case, to not put boundaries or barriers around responding.

"I'm happy to flip back a text if it's sort of 7:30 at night, just so that they've got an answer straight away" (Sarah).

"I don't put a whole lot of big rules around it. I don't say you can only ring me between 9:00 and five. Or you can't do this, or you can't do that. If you say to them, look, if you're worried about something, it's so easy just to get in touch. There's always somebody at the end of the phone. We're always here for you. And they don't abuse it" (Barbara).

While this raises potential issues around sustainability and work/life balance (which will be explored further in another publication), communication technology would appear to enable a continuation of connectedness as it continually builds on a relationship of knowingness and trust which is important within midwifery continuity of care.

Establishing respectful communications

The knowingness that is developed through a continuity of care relationship was shown through the respectful way midwives used communication technology to send quick messages to their clients prior to going away, or if they were running late. The ability to use communication technology in this way contributes towards the continuity of communication within continuity of care relationships.

> *"I want all my clients to know in advance this is my weekend off, just FYI." (Renee).*

> *"I always felt if you respect their time, they generally respect yours, whether it's a communication or, whatever...And for me, I would generally have an ish time. 11 ish, and if it was gonna look a little bit further out from there, I would communicate [text] that actually, I'm really sorry, I'm running late and I'll probably be another 30 minutes" (Ruby).*

The importance of being known within a continuity of care relationship often meant that the communications were reciprocated by pregnant women/people who also respected the midwife's time. This would be prefaced with an apology for texting out of hours.

> *"People are very mindful; they seem to be very respectful of home time and often in a text would apologise for contacting at the weekends" (Barbara).*

For others though, this wasn't the case. The knowingness and connectedness that comes within a continuity of care relationship, partnered with the expectation that communication technology enables connections 24/7 highlights a challenge when people use the technology at inappropriate times. Amy suggests that because of this, people have lost the art of being respectful.

> *"These days they sort of text at all hours of the night, backwards and forwards. They're constantly messaging each other. I think we've lost the art of being respectful. I don't wanna know at midnight that you need a scan referral for tomorrow morning" (Amy).*

Adrianne however suggests that communication technology has enabled people to more easily connect and therefore become normal for people to connect at any time of day or night. She seems to imply that the knowingness and connectedness that comes about through the development of a continuity of care relationship is different when the relationship is in the early stages.

> *"Every time you get new clients, you've always got ones that'll push those boundaries and especially with the younger generation. Expecting immediate answers and sending off a text in the middle of the night is normal to them" (Adrianne).*

In contrast, when the pregnant person is contacting a midwife who is unknown to them, the messaging content of the conversation is more transactional, where a message is sent to obtain the necessary information required. As Linda states, there's a certain anonymity about messaging someone who is unknown to them.

> *"If they know that you're covering another midwife, you're really anonymous and they'll just flick you a question. It's random. And that's interesting how the style of communication has changed for me… what I'm getting is 'what time's my appointment tomorrow', and I won't know who that's from" (Linda).*

The examples suggest there are differences in the respectful way communications happen depending on the knowingness and connectedness between the midwife and their pregnant clients. This knowingness and connectedness are deepened further through midwives' ability to negotiate appropriate means of connecting when using communication technology within a continuity of care relationship.

Negotiating safe and appropriate means of contact

Negotiating how to use communication technology appropriately was an important part of the continuity of care relationship that midwives develop with their clients. This negotiation would happen early in the relationship and continue throughout with reinforcing messages around urgent/non-urgent contact. At times these messages were quite prescriptive, to ensure safety of care around the communication.

> *"It's putting boundaries in place. How they communicate, what is texting and how does that work in regard to clinical care and when it's basically not appropriate for clinical conversations or questions" (Adrianne).*
>
> *"Well, part of our setup when I do my booking visit is to establish how we're going to communicate because there are times where it's completely inappropriate to text me...so from a safety aspect, we always establish what's appropriate in terms of how we communicate with each other (Linda).*

Despite midwives negotiating appropriate means of communication throughout the relationship, the knowingness and connectedness that came about through a continuity of care relationship provided midwives with an awareness that their pregnant clients may not know what constitutes an urgent concern. This was highlighted by midwives continuing to screen and respond to texts despite having provided quite prescriptive information on what to do if they have an urgent concern.

"Clients may not realise that it's urgent, they may not and that's okay, but I will say to them that if you don't get a response from me and you are still worried about something, then you need to ring" (Adrianne).

"After hours, if they were concerned, they wouldn't often ring, they might send a text and go, this is happening. Do we need to do anything now or can this wait till tomorrow" (Dengar).

The knowingness that comes about within a continuity of care relationship also means midwives are aware of challenges faced by their clients. This awareness contributes towards strategies developed by midwives to ensure their clients can connect and access their midwife.

Strategies for ensuring quality care

The awareness midwives have of challenges faced by their pregnant clients when using communication technology would seem directly attributable to the continuity of care relationship that is developed over the duration of the pregnancy and the 'knowingness' that comes with it. This would appear to give midwives insights into challenges faced by their clients which in turn enables them to develop strategies to overcome these challenges.

Financial challenges or inequities

Accessing midwifery care in NZ is free for childbearing women/people, however, there are still barriers for some people in accessing this care. Midwives often live and work in the same area as their clients and therefore have an awareness of some of the financial challenges faced by their clients. As a result, they had developed strategies to ensure their clients were always able to contact their midwife. This was done by using an 0800 free phone number which meant the person could contact their midwife without any cost to the person, or they would develop plans with their clients to call and hang up. The removal of financial barriers was enabled due to various communication technology options and in midwives 'knowing their clients'.

"We have an 0800 number ...and then they can press the option of which midwife they want to talk to" (Amy).

"If it's urgent, they have to ring. They have to have $5 credit on their phone... If you put good clear ground rules in place, then that's fine. In the daytime, I'm always happy for them to text and I'll ring them back. Or they can ring two times and hang up and I know who it was, and I'll ring them back. So yeah, got some strategies" (Irihapeti)

Many places in NZ have free Wi-Fi, so for pregnant women/people who may not have credit on their phone to call a midwife, they can access this free Wi-Fi data instead. Midwives were open

and flexible with their clients using a variety of platforms to ensure they were able to access and connect with their midwife.

> *"WhatsApp is useful for people who have limited funding because it's free. So, they can text or call me on WhatsApp for free" (Dengar)*
>
> *"Messenger has made it a lot more accessible...just go up to McDonalds or something" (Ruby).*

While there was recognition of financial challenges relating to use of Wi-Fi or cell phone connectivity, there was also awareness of challenges with accessing internet connectivity due to location.

Internet/cell phone coverage challenges

The continuity of care relationship that midwives developed with their clients, meant that midwives were aware of locations where their clients lived that had poor cell phone or internet coverage. Pre-planning formed an important part in strategizing how these connections would occur and always in partnership with their clients.

> *"The families themselves are great at knowing what their capabilities are. Even if we're not looking at a home birth, they'll always be a safety plan in place if something happens. We don't have Internet here, what's our plan and it could be that they get a booster in or short term they have satellite phones. If something happens during your pregnancy, we still need to have a plan, I need to understand what the comms are there. So, we pre plan it really" (Linda).*

This challenge with accessing internet coverage also extended to the midwives themselves and involved measures taken by midwives to ensure their clients were able to access them. Midwives would divert their phone to a colleague to ensure their clients have access to a midwife if needed or take measures themselves to ensure they were connected to access or document in electronic notes.

> *"If I know that I'm going somewhere where it won't be a signal, then I'll just divert my phone temporarily while I'm out to one of my colleagues. If it's urgent, they'll ring and then they'll get diverted" (Renee).*
>
> *"I'll use my phone to make a better hotspot so then I can run my computer to do the notes, but obviously, it chews through your data" (Sarah).*

When working within a continuity of care relationship, midwives can identify firsthand what is needed to assist with ensuring communications and connections are safe, particularly when

living and working within a remote rural location. For Linda, having satellite phones funded for rural midwives would be a step in the right direction.

> *"Remote rural midwives should have satellite phones funded. There should be technology like an EPIRB (Emergency Position-Indicating Radio Beacons). If I press the button because I'm in the middle of nowhere, it would activate say Saint John calling me, to see what was the emergency" (Linda).*

Another aspect that Linda identified is a need for technology to step up and automatically translate into a person's language within the electronic health notes. Being able to communicate in a language that is understood by the pregnant person offers a potential for improving client safety.

> *"Technology could catch up if we could auto translate to a person's language straight away. I can put into my notes in English, and it would auto translate to whatever language would be appropriate for her to read it in…for those mums where English isn't their first language, they can see what's written in the notes and if they can converse back to me in their language and I can also translate. Things like safety issues may be picked up or concerns that's going to improve the outcome of their pregnancy" (Linda).*

Continuity of care and the knowingness this brings, enables midwives to relate and connect with their clients. In being aware of some of the challenges, midwives were not only able to adapt their care and take measures to ensure safe communications, but to identify recommendations for how communication technology can be improved upon.

Discussion

The findings in this article focus on how communication technology facilitates quality care through enabling a sense of connectedness between LMC midwives and their pregnant clients within a continuity of care relationship. When considering what quality care entails, the QMNC framework identifies this through focussing on strengthening women's capabilities and ensuring care is tailored to meet women's needs. It does this through "identifying what a health system needs in order to provide high-quality care and how it delivers its functions and meets its goals within any particular context" (Renfrew et al., 2014, p. 11). Within the context of our study with LMC midwives, the quality of this care was enabled through the ability for midwives to use communication technology to tailor messages specifically to their pregnant clients, and through 'knowing' their clients, they were able to develop strategies to ensure access to care. This philosophy of midwifery care within NZ is one of partnership which is based on the midwife and childbearing women/person working together sharing knowledge, decision making and trust to enable the best outcomes for the pregnant person and their baby

throughout the childbirth continuum (Guilliland & Pairman, 1995). We acknowledge we have focussed on one aspect of the continuum, namely communication between LMC midwives and pregnant women/people during pregnancy. However, it is the strength of the relationships that are developed between midwives and pregnant women/people that are enabled through familiarity of the LMC midwife and are highlighted through the respectful way midwives use communication technology to communicate with their clients. It is this connectedness through being known that contributes towards midwives negotiating safe and appropriate means for contact. It is also this knowingness within the continuity of care relationship that enabled midwives to identify challenges with use of communication technology and develop strategies to ensure quality care through effective communication. An example here is with LMC midwives choosing to use a free 0800 number, to ensure their clients are always able to contact them.

'Effective communication involves a shared understanding between the sender and receiver of all verbal and non-verbal messages, successfully interacting by considering all responses and then responding appropriately' (O'Toole, 2016, p. 4). It is this shared understanding of the exchange that is considered important, and particularly so, when using asynchronous communication such as texting. What the midwives in our study have shown, is that continuity of care provides midwives with opportunities throughout the pregnancy to negotiate ways for using communication technology and it is the knowingness between the midwife and the pregnant woman/person that enables this connectedness.

In our study, midwives took opportunities throughout the pregnancy journey to reiterate appropriate means for contact and especially in relation to the use of text messaging. Midwives recognised their clients may not be aware of what constitutes an urgent response, and so would often screen and respond to text messages after hours, despite having previously provided prescriptive information on what to do if the person had concerns. This responding to urgent texts was enabled due to the continuity of care relationship that midwives have with their client's, and the emotional connection they have through a shared relationship of trust and respect.

Continuity of care provides an emotional connection between midwives and their pregnant clients which aids in the communication etiquette per say. When calling someone over the phone you would initially say hello and likely ask how the person is. Linda identified challenges she faced when working as a locum midwife and received what could be described as a functional or transactional text message which was devoid of any emotional content. Baggio (2016), comments that "texting allows for targeting and exchanging information in ways that

voice and face-to-face just do not support" (p. 114). In this instance, Linda was an unknown midwife, and therefore a sense of anonymity existed for the person in contacting her. There were no niceties, as there was no relationship established. O'Toole (2016) would suggest in these situations that the quality of the communication diminishes when there is a lack of face-to-face interaction. Park et al. (2014), would agree when describing the moral disengagement which occurs when a person disengages from their usual moral behaviour because of lack of immediate consequences. While Park, discusses this in relation to online content, it could just as easily be applied to the anonymity associated with sending a text message to someone who is unknown to them. Or equally, when less well known as highlighted by Adrianne in our study. In these instances, relationship continuity had not been established, and therefore is the point of difference when considering the quality and effectiveness of communication technology, when used within a continuity of care relationship. While our study has focussed on communications in the antenatal period, it is the establishment of these relationships and the knowingness that comes from it that have been highlighted in showing how communication technology facilitates the continuity of care relationship. Without this continuity, the communications, as highlighted by Linda, were impersonal and there is potential to therefore miss the nuances of what is being communicated. The negotiations around expectations with communication technology that would normally take place between the midwife and the pregnant woman/person when known to one another, had not occurred.

Baumeister & Leary (1995), suggest relational connections require two things, first, the need for frequent personal contacts or interactions with another person and second, a perceived need that there is a continuation of the relationship into the future. These relational connections are enabled through the continuity of care relationship established between midwives and their pregnant clients. When the midwife and pregnant person are known to each other, they are more likely to communicate in a respectful manner, due to the emotional investment in the relationship, and therefore more likely to communicate effectively. Miller and Bear (2023) suggest that the way midwives and their clients communicate with one another is 'a powerful indicator of the way the relationship is progressing' (p. 359).

For midwives in our study, continuity of care enabled a knowingness that meant they were more approachable which lends itself to opportunities for more effective communication. However, there were instances, where being connected and approachable was perceived as contributing towards communications that lacked respect due to people texting or messaging their midwife at inappropriate times. Floridi (2014), suggests that this is in part due to the changing realities that communication technologies enable. McKee & Porter (2017), also support this notion and ask 'what it is about the way we communicate that needs to change to

keep up with the dramatic changes in communication technologies' (p. 2). We would argue, that as a starting point, within midwifery, communication technology when used within a continuity of care relationship, enables midwives to connect with their clients and negotiate what this communication will look. In a recent study exploring pregnant people's use of communication technology with their midwife, pregnant people were satisfied with the way their midwife used the technology to connect with them, and this fostered a relationship of trust (K. Wakelin, McAra-Couper, & Fleming, 2023). It is the 'knowingness within the relationship' that in turn leads to effective communication and therefore quality care.

Chitongo et al. (2022) identified continuity of carer models as potentially beneficial in aiding midwives to understand barriers faced by women in ethnic minority groups. Barriers such as financial inequities or poor internet/cell phone connection were identified by midwives in our study. This recognition came about due to midwives knowing their clients and identifying barriers to accessing care. They mitigated ways around this by using an 0800 free phone number which was free for their clients to use, diverting phones to a colleague if they knew they were going to be out of cell phone contact, or pre-planning care where there were known internet or cell phone challenges. In doing so, they recognised what was needed within the health care system when providing quality care thus ensuring their pregnant clients were able to connect and access care from their midwife. There was also a recommendation however for the need for technology to be able to translate in real-time into a person's own language. There is already scope for implementing machine translation services within documents as shown by for example with Google translate (Vries et al., 2018). However, with the developing technology particularly with regard to Artificial Intelligence (AI), Deep L Translator has shown promising results with their ability to accurately translate medical articles from one language to another (Takakusagi et al., 2021). While Vieira et al. (2021) acknowledge that caution is needed when using translation services within health care settings due to the complex nature of language within these settings, AI potentially offers an opportunity to help bridge gaps where language maybe a barrier to accessing care. How this could be incorporated into electronic maternity health systems is something to consider.

Midwives were often living and working in the same area as their clients so were aware of the internet and cell phone challenges due to living in rural or remote locations. When midwives are aware of challenges, they have developed innovative strategies, using mobile technology to assist with education or connecting with colleagues (White et al., 2019). In a similar way, midwives in our study used communication technology to connect with midwifery colleagues and other health professionals to inform decision making or ensure access to services for their clients. What was different, however and highlighted through the importance of continuity of

care, was the development of strategies especially when living in rural areas. Linda explained how she works in partnership with families to develop a plan around how they will use communication technology to ensure safe care. This planning in partnership with one another is part of an emotional connectedness that LMC midwives and their clients have when living in rural communities (Crowther & Smythe, 2016), and is strengthened through the continuity of the relationship. Linda also recognised the need for midwives working in remote rural locations to be funded for satellite phones due to the challenges with poor internet or cell phone coverage in these areas. As part of a review into internet and cell phone connectivity issues within rural areas of NZ, 99.8% of the population are expected to have access to broadband and mobile coverage by 2023 (New Zealand Health and Disability System Review, 2019). This still however means that for 0.2% of the population, there will still be a need for further assistance – and the funding of satellite phones for midwives could be a viable option.

Strengths and Limitations

A strength of the study is the fourteen midwives participated in the interviews, had also taken part in the online survey for phase one of this research. The midwives were therefore able to expand further on issues that had been identified from the first phase of the multi-phase study and provide further insights into the valuable role that communication technology plays within a midwifery continuity model of care.

Limitations for the study are recognised in reporting on one of the themes identified from the overall study. There is potential that some context may be missing such as how midwives balance maintaining connections with pregnant clients while also protecting their own boundaries. These findings will however be reported on in another publication.

There is a further limitation in only reporting the findings from interviews with LMC midwives. Interviews were undertaken with pregnant women/people, and these have been presented in another publication.

Conclusion

The findings from this study have shown that communication technology facilitates quality care through the continuity of care relationship. It is the knowingness that comes about through the continuity of the relationship that enable midwives to connect and to adapt if necessary to meet the needs of their clients. Continuity of care privileges midwives with knowledge of challenges faced by their clients which in turn enables them to develop strategies to ensure

communications and connections with their clients are undertaken in a safe manner. It is these aspects of communication technology that specifically benefit recipients of continuity of care and therefore contribute not only towards quality maternal care, but to the body of knowledge associated with midwifery models of continuity of care.

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Chapter 8.3

It's about getting the balance right: Midwives' experiences with using communication technology with their pregnant clients.

Chapter Overview

This chapter presents the findings from interviews with LMC midwives in phase 2A, of the multi-phase study and is presented as a paper which has been accepted for publication. The aim of this paper is to report on the third and final theme 'finding balance' which was one of three findings from interviews conducted with LMC midwives. Ethics approval related to the study was obtained and granted by the Auckland University of Technology Ethics Committee (AUTEC): 20/279 (See Appendix B:1).

The references are presented in this chapter as APA 7th edition, in accordance with the standardised formatting requirement for submission of the thesis through Auckland University of Technology and in accordance with the requirements of the journal in which it was published. The published version in 'Early view' is available via the following link: https://connect.springerpub.com/content/sgrijc/early/2024/04/12/ijc-2024-0004

Author contributions

The co-authored paper is the sixth publication over the course of this PhD study. The bibliographic details of this co-authored in-press paper are:

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My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), and Dr Tania Fleming (Secondary Supervisor), involved: preparing and submitting the ethics application, conceptualisation, formal analysis, investigation, and writing of the original paper.

Signed:

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Introduction:

The Quality Maternal and Newborn Care (QMNC) framework is designed to be used to assess the quality and effectiveness of care within a maternity context (Renfrew et al., 2014). O'Toole (2016), suggests that for communication to be effective, there needs to be a shared understanding between the sender and receiver of verbal and nonverbal messages, with appropriate and considered responses. Use of communication technology such as texting, or sending photos is rapidly evolving. This is due to the asynchronous nature of messaging which enables people to connect easily with one another from anywhere at any time. As a result of this, Floridi (2014), suggests that the digital age is not only changing how we communicate, but how communication technology is changing us and in doing so, reshaping our sense of self, our identity, and the way we relate to society.

There are four potential concerns around communicating in this way which can have implications on the way midwives and pregnant women/people communicate with one another. The first being in the quality of relationships that people are developing, and the potential for becoming less skilled at communicating within an in-person face-to-face environment (Allred & Atkin, 2020; Biglbauer & Korajlija, 2023). This is due to the ease and convenience with communicating in the asynchronous space where there is a delay between the sending and receiving of messages. Communication technology provides a screen behind which people can potentially hide and can develop a persona which may be different to one they portray in-person (Baggio, 2016). As people become more comfortable interacting in the asynchronous space, they may become more uncomfortable and less able to pick up on visual cues when interacting in face-to-face in-person situations. Further to this, is the potential for misinterpreting text messages due to an inability to detect tone or other non-verbal cues from the message (Baggio, 2016). This was an issue identified by midwives in an online study conducted by the authors in phase 1 A of their multi-phase study (K. J. Wakelin et al., 2023).

The second issue that results from the way people in society use communication technology is in the need to 'always be connected' which has been posited as being due to a 'fear of missing out' (Roberts & David, 2020). Because of this need to be connected, there has become a blurring of boundaries between work and home, personal and professional and private and public spheres (McKee & Porter, 2017). This 'blurring' potentially creates significant challenges for lead maternity carer (LMC) midwives in Aotearoa New Zealand (NZ) who provide continuity of care to their clients. LMC midwives reported receiving texts for non-urgent concerns regardless of the time of day or night (Wakelin et al., 2023).

This leads to the third issue for LMC midwives, with how they maintain their work/life balance when their pregnant clients can access them 24/7 through use of communication technology. The midwifery model of continuity of care in NZ means that the midwives' clients have their contact details. Despite midwives providing quite prescriptive information on when and how to be contacted, the ease of the technology meant midwives would often receive text messages out of hours for non-urgent matters (Wakelin et al., 2023). There were no perceived boundaries around the need for always being connected, which had implications for midwives in how they maintained their work/life balance.

The fourth issue relates to the security of people's personal and private information and who has access to this when communicated through the cyberspace of texting, emailing, and online social media platforms. Globally numbers of scams, cyberattacks and ransomware demands have increased particularly since the Covid-19 global pandemic where increasing numbers of people were working remotely from home due to the need for isolation (Al-Qahtani & Cresci, 2022). In a recent statement released by the Office of the Privacy Commissioner in NZ, all agencies whether big or small are recommended to introduce two-factor authentication to protect the security and privacy of their client's information (Privacy Commissioner|Te Mana Mātāpono Matatapu, 2023). This would be considered reasonable steps to take in protecting client's information. If reasonable steps have not been taken, organisations could be found in breach of the Privacy Act (Privacy Commissioner|Te Mana Mātāpono Matatapu, 2023).

Lead maternity carer (LMC) midwives in NZ are therefore having to balance the convenience with using communication technology with how these impact on the relationships they develop with their clients, how they maintain boundaries around work and personal life. An additional concern is how they ensure they are protecting their client's information. These issues were identified in interviews with LMC midwives with how they use communication technology when connecting with their pregnant clients in phase 2 A of the multi-phase study.

Aim:

The aim of this paper is to report on the findings from interviews with LMC midwives on how communication technology is used with their pregnant clients. This article will report and discuss the findings from the third theme, finding balance. The findings from the other two themes have been submitted as separate publications.

Methods:

This present study reports on the findings from semi-structured interviews with lead maternity carer midwives in phase 2A of a mixed methods multi-phase sequential transformative design which uses a theoretical framework to guide the study (Teddlie & Tashakkori, 2009). The Quality Maternal and Newborn Care (QMNC) framework is the guiding framework for this multi-phase study (Renfrew et al., 2014). Questions for the semi-structured interviews were informed by the findings from an online survey with LMC midwives in phase 1A of the study. The interviews were piloted with a midwifery colleague who was not involved in the interviews to ensure there weren't any technical difficulties with using the online platform (L. M. Gray et al., 2020). Piloting the questions also served to gauge the natural flow of the interview. An example of the questions used to inform the interviews are provided in table 1. These questions were informed from findings of the online survey with LMC midwives in phase 1A of the study.

Table 1: Questions to inform semi-structured interviews with LMC Midwives

Findings from the online survey with LMC midwives indicated that Wi-Fi can be problematic. • How do you negotiate contact with your pregnant clients when this is the case? • What strategies do you use if you are out of 'cell phone' or 'Wi-Fi' coverage?
How do you use communication technology in your day-to-day practice? • Do you use communication technology to reinforce information shared or to provide health messages? • Do pregnant clients share information with you outside of scheduled appointments?
What have been some of the main concerns for you when using communication technology to connect with your pregnant clients?
Can you tell me how you have managed concerns if pregnant clients contact you in a way you deem to be inappropriate?
How have you used communication technology to sustain yourself in practice? • Are there some platforms that work better for you than others?
Do you have any concerns around privacy or confidentiality of information if shared over online platforms? • Do you use security protection measures with your communication devices?
Have you needed to adapt the way you contact your pregnant clients?

Semi-structured interviews were conducted using Microsoft Teams, which is an online platform the first author was comfortable and familiar with using. The online interviews took between 40-60 minutes. Ethical approval for the study was granted by Auckland University of Technology Ethics Committee (AUTEC 20/279).

Setting

Online interviews took place using the Microsoft Teams platform with LMC midwives in NZ from September – October 2022.

Participants

In phase 2A, midwives who had previously undertaken an online survey in phase 1A and had expressed interest in participating further in an online interview, were emailed an invitation to participate. Fourteen midwives responded to the email invitation. A further email was then sent to the participants with information regarding the platform to be used, how to connect along with attachments of the participant information form and consent form. A day and time for the online interview was then negotiated once they agreed to take part. The fourteen midwives who agreed to take part in the interview were representative of the midwifery workforce in NZ in terms of age (average age 47 years), ethnicity (NZ European, Māori, Pasifika, Asian and other European), years as an LMC midwife (with most having worked between 2-15 years) and geographical location (urban, rural and remote rural) (Midwifery Council |Te Tatau o te Whare Kahu, 2021).

Analysis of data

Analysis of the data was undertaken using a six-step process as outlined by Braun & Clarke (2022). This process involves 1) familiarisation, 2) coding, 3) generation of initial themes, 4) developing and reviewing themes, 5) refining, defining, and naming themes and 6) writing up. As part of familiarisation, the recorded interviews were transcribed by the first author and returned to participants for member checking within one week of the interview taking place to ensure the transcription was accurate (Stahl & King, 2020). The transcription and recording functionality of the platform provided a convenient way to simultaneously listen to the recording while reading the transcript. If errors were noted, the recording was stopped, and the transcript amended. All transcripts were returned and only one interview required a minor change to some wording. The transcripts were then re-read several times by the first author, alongside reviewing the recorded interview with comments made in comment boxes prior to the commencement of coding. Once the initial colour coding began, transcripts were again re-read and then categories were created using an Excel spreadsheet. The spreadsheet was an efficient way to work with substantial amounts of data. Once initial themes were generated, the first author then provided the coding table to the other authors (who were the first author's supervisors) and had not been involved with the coding process. The other authors

were able to take an objective and critical review of the themes, coding categories and data segments to ensure validity of the process. The final themes were then re-reviewed to ensure they reflected the participants experiences.

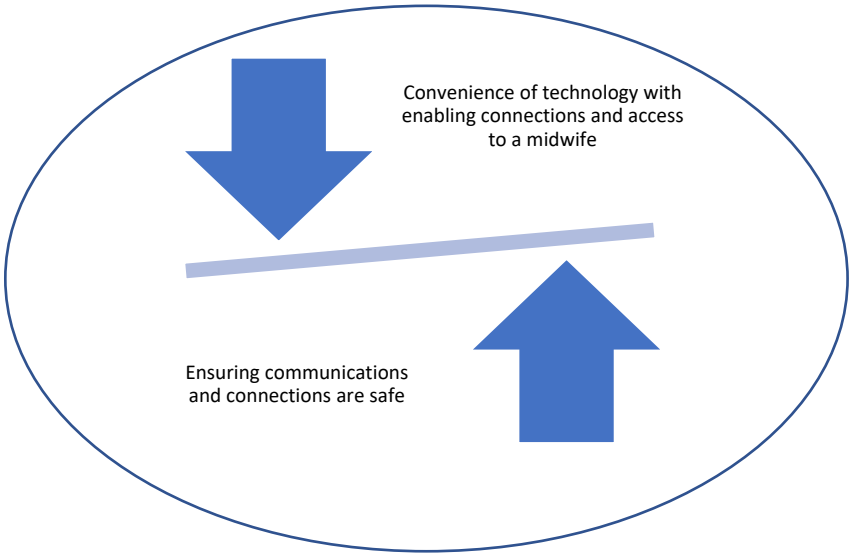
Findings:

In this phase of the study, midwives were interviewed to explore how they used communication technology to communicate with their pregnant clients. There did not appear to be notable differences reported by midwives in the way they used communication technology with their pregnant clients in terms of age, ethnicity, length of time as a midwife, or whether they worked in urban, rural, or remote rural settings. Where these differences were noted, these have been discussed within the findings and discussion sections. All participants expressed comfort with using communication technology, and age of the midwife did not appear to influence their uptake or use of the technology. Reid & Reid (2010) suggest that the ability to use communication technology and feel comfortable using it has more to do with a person's self-efficacy, and belief in their ability to understand and master the use of technology rather than their age. This notion of self-efficacy would appear to be supported by the midwives in our study.

Finding Balance

The findings indicate that what midwives appear to be doing, is finding a balance. They are balancing the convenience of the technology while ensuring communications and connections are safe for their clients, all the while balancing these connections with maintaining and protecting their own work/life balance to ensure they are practising in a sustainable way.

Figure 1: Finding balance



Three sub-themes were identified; (1) balancing the convenience of technology with relationships; (2) balancing convenience with safety of data (privacy/confidentiality); and (3) balancing communications with maintaining work/life balance. Table 2 outlines the development of the three sub-themes with examples from interview text.

Table 2: Development of themes: 'finding balance'

Finding balance	Balancing convenience of technology with relationships	"*Digital technology will never make sense, no matter how clever it gets. It is useful across how we keep our notes, how we communicate with people and how we share information. It can be part of that feast at the table, but it doesn't beat the sitting around and consuming it together and that dynamic that happens when human beings get together… And we have to be careful that we don't deskill our humanness" (Linda).*
		"Some people are very different via text and then you get face-to-face with them and they're very awkward, and you think wow, you don't sound the same at all, like you do on texts. On texts you're very eloquent and you've got a lot of questions and ha-ha emojis and all this sort of stuff but in person, you're super awkward, but I guess it's the whole keyboard warrior culture. There's anonymity in texting or, where they feel more comfortable and able to express themselves but face-to-face there is the awkwardness of one on one" (Sarah).
	Balancing convenience of technology with safety of data (privacy/confidentiality)	*"Some of the apps, once you open a picture, it's automatically downloaded onto my gallery, which is why I prefer, them to use Messenger. Messenger won't do that. But WhatsApp and Viber, they are defaulted to flick it through to your gallery. I don't want these photos on my phone" (Renee).*
		"You can put a woman in a very unsafe position. I will never, ever, ever e-mail any woman, ever, because you don't know who is receiving that. And, that can cause immense unsafe situations, especially if it's a young teen who's not disclosed the pregnancy" (Irihapeti).
	Balancing communications with maintaining work/life balance	*"I've really found that auto responder has been a game changer. I don't have my notifications on at all for text messages. It doesn't light up or anything. There's not even a little symbol that says there's a text messages. I have to go in to check my text messages. So that's been really good" (Adrianne).*
		"The pager gives a sense of separation The client rings the pager number, and then they talk to someone at the call centre. And then that call centre person will put a message across... if I'm off for the weekend or if I went on holiday or sleeping after a birth, my pager is off. So, I don't have to deal with it. I know that it's being covered" (Bella).

Balancing the convenience of technology with relationships

Communication technology has enormous benefits which midwives identified especially in relation to the convenience and efficiency with which they could connect with their clients through texting. Midwives can check their phone for messages at their convenience, choose how and when to respond, share information, and incorporate texts into their documentation (Wakelin et al., 2023). While there is no denying the benefits communication technology has in enabling people to connect, Linda warns of the potential 'deskilling as humans' that may occur because of our reliance and increasing use of asynchronous communication. In doing so, we begin to lose the ability to communicate within an in-person face-to-face interaction.

> "*Digital technology will never make sense, no matter how clever it gets. It is useful across how we keep our notes, how we communicate with people and how we share information. It can be part of that feast at the table, but it doesn't beat the sitting around and consuming it together and that dynamic that happens when human beings get together… And we have to be careful that we don't deskill our humanness" (Linda).*

Sarah further highlights the challenge with trying to communicate with clients when in-person. The ability for people to text or communicate in written form rather than verbalise would appear to provide an avenue for people to express themselves, to hold space for their humanness which they otherwise wouldn't be able to do.

> *"Some people are very different via text and then you get face-to-face with them and they're very awkward, and you think wow, you don't sound the same at all like you do on texts. On texts you're very eloquent and you've got a lot of questions and ha-ha emojis and all this sort of stuff, but in person, you're super awkward, but I guess it's the whole keyboard warrior culture. There's anonymity in texting or, where they feel more comfortable and able to express themselves but face-to-face there is the awkwardness of one on one" (Sarah).*

The awkwardness that Sarah identified whilst communicating face-to-face was also highlighted through the awkwardness or discomfort that people have when speaking over the phone. Jordan indicates this awkwardness may be more prevalent now because of a generation of people who have grown up with text as the mode of communication. As a result, young people won't call the midwife even if it is something they are concerned about.

> *"A lot of younger clients won't call for things that they should, they will text. Even if they are wanting a response soon.... They have a lot of anxiety around phone calls, and they won't answer phone calls, they don't like making calls. Anyone under 30 I find is very common" (Jordan).*

The difficulty or discomfort with speaking over the phone wasn't just an issue identified by midwives with their clients, but also an issue some midwives had themselves with speaking over the phone, and this was largely due to not being able to 'see the person'.

> *"It's just the whole phoning. You have to have a conversation with someone or start the conversation up. It's really awkward... I can't read people's body languages and try and pick up those cues as easily as I can when I see someone face-to-face" (Amy).*

While midwives acknowledge the convenience of using communication technology, whether it is via text, sending a photo, or even via a phone call, there was recognition of the limitations around non-in person-face-to-face communication. This was due to an inability to pick up on non-verbal visual cues and the potential for misinterpreting text messages. Midwives were concerned they may miss something, which could only be achieved through an in-person visit.

> *"There are some people that can't really express themselves that much via text or phone calls. So, if it's anything that's concerning them, usually it means that we're going to have to see them for a face-to-face physical visit because there's lots of information that could only be gained if you see them in person, especially with midwifery because if you have to take a blood pressure or do a palpation" (Mary).*

> *"If it is something simple, text and pictures is fine. There probably would be some words that someone might say to me that it wouldn't matter how many pictures they sent me. I am still going to do a physical assessment" (Denise).*

Both Mary and Denise have highlighted the value with using technologies as a guide to determine whether a more thorough assessment is required. There is a recognition that communication technology has value in enabling connections to happen, however, it is about ensuring the balance is right, so that the essence of the relationship that midwives develop with their clients is not lost within the convenience of the technology.

> *"The two need to come hand in hand and the two need to be at the table together. But I wouldn't say they should be evenly at the table. The electronics should be about 40% and the people should be about 60%. And if you can get that balance about right, you're actually showing respect and meaningfulness" (Irihapeti).*

So, getting the balance right with how midwives and their clients are using communication technology when communicating with one another is highlighted further when considering how to balance convenience of the technology with issues of privacy and confidentiality of client information.

Balancing convenience with privacy and confidentiality

Midwives have identified the need to balance the convenience of receiving texts, photos, and use of electronic health systems, with ensuring privacy and confidentiality of information. While midwives take measures themselves with passwords and double authentication, there was concern with who has access to this information and the security of these systems.

> *"I don't know how to protect the technology better. You have safeguards on your computer, you're trusting Apple security when you're using an iPhone and all the other Android phones, but there's people in positions of immense power that have access to sensitive data. If all my notes are digital, it means that anyone who is any bit clever can hack into that, and all that woman's information is there. That worries me and I don't think as a nation we are up to speed enough… I don't think we have it in healthcare, and we've seen that because we've seen the DHB's [District health Boards] hacked out and closed out and held to ransom" (Linda).*

On the other hand, Denise was quite pragmatic about security of information implying that security has always been a concern regardless of the mode in which it was sent.

> *"People contact me by email, and they say, people can get into Gmail and it's not secure. Well, people can get into your post if they want to go to your mailbox. And well, that it just is what we are living in these days" (Denise).*

A particular issue identified by several midwives was around the storage of photos sent to them by their clients. While electronically being able to send a photo has been helpful for midwives in informing decision making, they are then downloaded and sit within the gallery on the midwife's phone. Midwives who were aware of this, would take measures such as deleting them or negotiating with clients to use other platforms, for others, it came as a shock when they opened their photo gallery to find client's photos sitting there.

> *"…with What's App, the photo will get saved into your phone, and it becomes part of your photo gallery, so you do have to be quite careful. It is not great from a privacy perspective, and you have to be careful to delete them" (Bella).*

> *"Some of the apps, once you open a picture, it's automatically downloaded onto my gallery, which is why I prefer, them to use Messenger. Messenger won't do that. But WhatsApp and Viber, they are defaulted to flick it through to your gallery. I don't want these people's photos on my phone" (Renee).*

The convenience for midwives with using communication technology to send emails, texts or even leave voice messages needs to be weighed up with knowing who is receiving these messages. Midwives were aware of their role and the potential implications on a person who is

pregnant, in terms of privacy and confidentiality of information, especially when communicating in a non-face-to-face situation.

> *"You can put a woman in a very unsafe position. I will never, ever, ever e-mail any woman, ever, because you don't know who is receiving that. And, that can cause immense unsafe situations, especially if it's a young teen who's not disclosed the pregnancy" (Irihapeti).*

> *"There are issues with calls, texting, especially with a lot of people have voice messages that don't have their name, or it will have someone else's name, but it is still their phone. How much information can I leave on this phone? Can I even say I'm a midwife? Does everyone know that you've had a baby or that you're pregnant?" (Jordan).*

Midwives have acknowledged the convenience of using communication technology when connecting with their clients, and the need to balance this through ensuring pregnant people's confidential information can be protected. Another area requiring balance, was in the protection of midwives' personal space and the need to find a sustainable work/life balance.

Balancing convenience of connection with sustainability (work/life balance)

Midwives were very aware of the convenience of communication technology in enabling connections with their clients. They discuss with their client's early on in their relationship when it is appropriate to text or when a phone call is required and as such were aware of how technology can be used to sustain themselves in practice while ensuring there was always someone for the person to contact if they had urgent concerns. One such convenience was the ability to set up autoreplies which enabled midwives to establish boundaries around sustaining a better work/life balance for themselves.

> *"I've really found that auto responder has been a game changer. I don't have my notifications on at all for text messages. It doesn't light up or anything. There's not even a little symbol that says there's a text messages. I have to go into check my text messages. So that's been really good" (Adrianne).*

There was convenience for midwives in having a phone which was able to use two SIM cards, with two separate numbers. This meant midwives were able to keep in contact with friends and family using one number, while keeping their work number separate. They would then set up an autoreply on the work phone number to maintain work/life boundary.

> *"I've got a dual SIM on my phone. So, I've got a work number, and the auto reply is only associated with my work phone number" (Renee).*

For other midwives, having two phones meant there was a physical boundary between communications between their clients, friends, and family. They preferred to keep these two aspects of their life separate and would physically put their work phone away when off call to create this balance.

> *"I feel confident enough to have two phones and be able to put one in a drawer and not worry about it if I'm off call because that's more to do with burnout and sustainability being able to not see stuff that's going on when you are off call" (Adrianne).*

Having a pager was a way for midwives to also create separation from work and personal life. It provided reassurance for the midwife that when they were off, clients were still able to contact another colleague.

> *"The pager gives a sense of separation. The client rings the pager number, and then they talk to someone at the call centre. And then that call centre person will put a message across... if I'm off for the weekend or if I went on holiday or sleeping after a birth, my pager is off. So, I don't have to deal with it. I know that it's being covered" (Bella).*

Midwives were able to take different measures to create a boundary between work and personal life when using a mobile phone or pager with a contact number. Where maintaining work/life balance became problematic, was when social media accounts were linked with a mobile phone. The ability to connect via social media accounts was problematic for midwives when clients used midwives personal accounts to connect with them. This required midwives to take measures through suggesting other ways for this communication to occur to protect their personal boundary space.

> *"I am a bit picky about Messenger. I'll suggest a different one if I can unless I already knew them only because obviously it connects to your Facebook, so that's not so boundary friendly...otherwise I'll be like, 'have you got Viber or WhatsApp?' because then that's not necessarily connected to your actual personal social media account" (Renee).*

> *"And the other would be like Messenger with Facebook Messenger. I don't have a business Facebook and they somehow reach my personal Facebook and start messaging me with it. I'm like contact me on my work phone" (Mary).*

Midwives recognised the need to balance how they used communication technology with how they sustain themselves in practice. Balancing the workspace and the personal space can be a challenge for LMC midwives, particularly when technology platforms enable pregnant people to connect so easily and readily. Establishing boundaries to protect personal space was important especially in a world where instant connection is so accessible.

Discussion

This article focuses on the theme 'finding balance' which is what midwives appear to be weighing up when considering the quality of the relationship's midwives develop with their clients, the protections around client information and the sustainability of midwives' own practice in terms of ensuring work/life balance.

Getting the balance right

Midwives identified a need to ensure the balance is right when considering the convenience of using communication technology with the relationships midwives develop with their clients. Floridi, (2014) suggests that communication technology has not only changed how we communicate when using technology, but also in the way people use the technology to communicate with one another. There is recognition within the literature that ethnicity may have an impact on the way people use communication technology (Kim et al., 2007; Urrutia et al., 2015; Zwimpfer et al., 2017). While ethnic or cultural differences that may impact on how communication technology is used, did not feature with the midwives in our present study, it is acknowledged that there may be differences with how technology is used, and is an area that requires further investigation.

What was identified, and commented on by participants, was concern with the impact that reliance on technology might have with the potential for losing skills when interacting in a face-to-face in-person context. This concern was not unfounded given the evidence to support overuse of smart phones negatively impacting on the quality of face-to-face interactions in areas outside of healthcare settings (Allred & Atkin, 2020; Botrugno, 2019; Rotondi et al., 2017). This is thought to be due to young people growing up within a digital environment and being less comfortable communicating or engaging in face-to-face interactions (Allred & Atkin, 2020). The concern with this type of communication and the relational aspect that goes with it, is that communication is happening at a distance in what is described as a disembodied environment, which is devoid of non-verbal visual cues to assist with understanding communication (Kegley, 2018). When there is a lack of visual cues, there is the potential for misinterpretation of messages due in part to what Baggio (2016), describe as a two-dimensional space. In contrast, for people who are socially awkward within face-to-face interactions, communication technology offers a space with which connections and communications can take place (Biglbauer & Korajlija, 2023). This highlights the importance therefore of negotiating and tailoring the use of communication technology to individual

needs. The potential to misinterpret a message within a health context could have far greater concerns than say misinterpreting a message in a social environment.

Another aspect identified by midwives in the study concerning non-face-to-face communication, was the anxiety some people seemed to have with speaking over the phone. Again, this could be due to the increasing preference people have for texting and communicating in this way (Pinchot et al., 2012; Swanson et al., 2018). So, while some people may be uncomfortable interacting in a 'real-time' synchronous space, communication technologies would appear to provide opportunity for people to develop skills and hold space to enable effective communications to take place. Baggio (2016), would suggest texting provides an anonymous way in which to communicate and therefore could impact on the way people express themselves. This was certainly identified by Sarah in the study when she commented on how eloquently her client was able to express herself via text in comparison to being in-person. In an equivalent way, communication technology has enabled people to ask questions in a virtual environment that they can't ask when face-to-face (Gasteiger et al., 2019; McCarthy et al., 2017; Wakelin et al., 2023).

While texting may offer a space for initial connections and questions to be asked, there is still value with in-person face to face contact when interacting with a midwife (Gasteiger et al., 2019). Swanson et al (2018), also noted in their study exploring communication preferences of collegiate students aged 18-29 years, that in contrast to Allred & Atkin (2020), study of university students, there was a preference for face-to-face interactions over the telephone as it offered people an opportunity to 'pick up' on visual cues. This was identified by Amy in our study. While she found speaking over the phone difficult, she would much prefer face-to-face interactions as she could pick up visual cues from her clients.

Lupton & Maslen (2017), comment on the importance of 'sensory engagement' which involves visualising, listening, touch, along with asking questions to ascertain information to inform clinical decision making. Midwives in general rely on using their senses when undertaking physical assessments, such as abdominal palpation or blood pressure. So, it is about finding the balance to ensure the communication modes that are available, are used in an appropriate way at the appropriate time. When getting the balance wrong, however, has implications on quality care for pregnant people as was identified in a recent case by the Health and Disability Commissioner in NZ, where a midwife was criticised for the advice given to a labouring person using text (Deputy Health and Disability Commissioner, 2023). Baggio (2016) suggests that just

because there is convenience and familiarity with using technology to communicate, it does not mean people understand how to use it effectively. This has implications with the notion of always being connected and the ability to send a message at any time of the day or night. Just because something can be done, does it mean it should, particularly when considering the impact this may have on boundaries between a midwife's private and work life. For example, one of the midwives in the present study reported on a client sending a text late at night about a scan appointment they had the next day. The midwife chose not to respond until the next day. Knowing when and how to disconnect from the technology is important for midwives in being able to sustain themselves in practice.

Establishing and setting boundaries

Sustainability of Midwifery practice within NZ has been an issue identified by midwives for many years and seems to focus around two areas; sustainability through the relationships that midwives develop with their clients, and in boundaries around work/life practice (Gilkison et al., 2015; Leap et al., 2011; McAra-Couper et al., 2014; McLardy, 2002; Pace et al., 2022; Wakelin & Skinner, 2007). It is the latter that was a focus for midwives in this present study around how communication technology such as use of the autoreply message to texts which enabled them to sustain themselves through creating a better work life balance. Pace et al. (2022) define the concept of work-life balance as "*the midwife's ability to have time they personally required… for their own needs"* (p. 225). It is important to point out, that midwives negotiated with their clients on the appropriateness of the technology, being dependent on the concern. For example, with an urgent concern, pregnant people were asked to call their midwife whereas for non-urgent concerns, texting was appropriate. It was, however, the functionality of the technology (along with negotiating how the technology was to be used) that enabled the midwives in our study to set boundaries around creating a work/life balance, and the lengths they would go to in finding a system that was going to work for them.

Geser (2004), in discussing the increasing usage of the cell phone commented that "users gradually change habits and learn to apply the new technology for a growing variety of purposes and in a widening range of situations" (p. 7). While these comments were made twenty years ago, the ability to apply modern technology into a variety of purposes still stands today. The midwives in the present study identified two strategies they adopt to sustain themselves in practice and create a better work/life balance. The first was in the use of autoreplies which were set up on their phone to respond to texts or phone calls (as indicated by Adrianne), and the second was in having two separate phones, one for work, and one for family/friends (as highlighted by Renee). This choice appeared to be a personal one and for

midwives who did not want to carry two phones, would instead use two SIM cards in one phone.

Challenges with finding balance

Midwives in this present study also identified challenges when trying to protect their work/life balance which was made more difficult through the ability for people to connect to the midwife through their personal social media accounts. Basevi et al. (2014), identified similar challenges with health professionals receiving friend requests or being contacted by clients. For the midwives in our study, this resulted in them taking measures to protect their own personal space by either not engaging, indicating a more appropriate means for contact, or not using their own name when creating a social media account. Dual citizenship is the term referred to when people create different private or professional identities within the online space (Gagnon & Sabus, 2015). It highlights once again, the convenience with which communication technology enables engagement and connection with others, but also the need for balance when using the technology within a professional workspace, and when considering the implications around privacy and confidentiality of people's information.

Midwives are very aware of the need to balance the convenience of communicating via text, email, or phone with the need to ensure privacy and confidentiality of client's information. This concern around privacy and the potential for breach of confidentiality has also been identified by general practitioners regarding text messaging (Leahy et al., 2017). What is different for the midwives in our study, is in providing continuity of care, and in knowing their clients, they were able to take measures before texting, sending emails or leaving messages on a phone unless they were certain that the person receiving the information, is the person it was intended for. Further conveniences were highlighted with the ability to share and receive photos either from their clients or colleagues, which have similarly been found in other areas of healthcare (Nettrour et al., 2019). This ability to share photos through communication technology, or store images in electronic notes has become what Botrugno (2019), describes as "the digitalisation process that patients' bodies are not only increasingly virtualised but also datafied, stored and accessed over the wire" (p. 7). One of the concerns, which was highlighted by Linda, is what happens with this sensitive private information that is now contained within an online format, and who potentially has access to this.

The National Cyber Security Centre (NCSC) reports each year on the number of cyberattacks within NZ, both from National and International sources (Te Tira Tiaki|Government

Communications Security Bureau, 2023). Within the 2020/2021 financial year, healthcare was a primary target, with the breach of patient data from one of the larger hospitals uploaded to the dark web (Health Informatics New Zealand, 2022; Otago Daily Times, 2021). These malicious software attacks are designed to cause damage to a victims' computer or to organisations networks that provide services and require the user to pay a ransom to retrieve access to their data (Reshmi, 2021). While midwives are taking measures such as using pin codes, double authentication, or face recognition on their phone (Wakelin et al., 2023), once their phone is hacked, the information stored on it is then accessible to whoever gains access. This is concerning when considering that photos sent to midwives in some cases are automatically and unwittingly downloaded onto the midwife's personal photo gallery. This was a surprise to midwives in this present study who had chosen to use one phone with a separate SIM card to delineate between their work and private life. They had not appreciated the photo gallery was associated with the phone and therefore, photos did not differentiate between the two phone numbers.

The findings have highlighted the challenges LMC midwives are faced with when trying to balance the convenience of the technology with ensuring privacy of information whilst at the same time, trying to protect their personal boundary space. Irihapeti sums this up nicely when commenting *"on the need for the two to come hand in hand and be at the table together".* It is this weighing up and having awareness of the strengths and limitations of communication technology, and then incorporating both into the kete of knowledge that midwives draw on when connecting with their clients.

Strengths and Limitations

A strength of the study is the mixed method multi-phase design which enabled the fourteen midwives who took part in the online survey as part of phase one of the study to undertake interviews for phase two. The issues identified in phase one of the study provided valuable information They were able to expand on issues identified from phase one and provide further insights into the balance that is required by midwives when using communication technology with their pregnant clients.

Limitations however are recognised as this article focussed on one theme that might lack contextual information when considered separate from other findings. There is potential that some context maybe missing such as detail exploring the importance of the continuity of care relationship and the impact this can have on the way midwives sustain themselves in practice.

A further limitation to this present study is on focussing solely on how LMC midwives used communication technology with their pregnant clients. It is unknown whether the issues identified by the midwives in this present study would be similar for all midwives regardless of whether they work in the community or are hospital-based.

Conclusion

Midwives have identified the balance that is needed when weighing up the convenience of using communication technology with the relational aspect of connecting with their pregnant clients and privacy and confidentiality of client information. Communication technology is often touted as being problematic with the lack of face-to-face connection and connect ability 24/7. However, the midwives in our study have shown communication technology is also part of the solution, particularly with the adoption of strategies used to assist midwives in maintaining a better work/life balance. Midwives are using the technology to find a balance between the way they connect with their clients, and in sustaining their work and private lives. It is this functionality that has been considered game changing for the midwives in our study. This balance and awareness are what helps to contribute towards quality maternal and new-born care, through enabling midwives to practice in a more sustainable manner. Ethnicity or cultural differences weren't reported on by midwives in this present study. It does however identify an area that would benefit from further research, to understand the impact this may have and how balance is achieved through use of communication technology between midwives and their clients.

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Chapter 9

"It's a given now, that's just how we communicate": Pregnant women/people's experiences with using communication technology when connecting with their midwife.

Chapter Overview

This chapter presents the findings from interviews with pregnant women/people in phase 2B, of the multi-phase study and is presented as a paper under review for publication. The aim of this paper is to explore how pregnant women/people use communication technology when connecting with their midwife and to identify what is important for them when connecting in this way. As this is a paper under review, reference to previous publications, are indicated with XXXX to ensure anonymity. Ethics approval related to the study was obtained and granted by the Auckland University of Technology Ethics Committee (AUTEC): 20/279 (See Appendix B:2).

The references are presented in this chapter as APA 7th edition, in accordance with the standardised formatting requirement for submission of the thesis through Auckland University of Technology and in accordance with the requirements of the journal in which it was published.

Author contributions

The proposed bibliographic details of this co-authored paper are:

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My contribution as first author under the guidance of Professor Judith McAra-Couper (Primary Supervisor), and Dr Tania Fleming (Secondary Supervisor), involved: preparing and submitting the ethics application, conceptualisation, formal analysis, investigation, and writing of the original paper.

Signed:

Karen Wakelin Date: 7th May 2024

Countersigned: Date: 7th May 2024

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Introduction:

The way pregnant women/people access, connect and communicate with their midwife is important in establishing trusting and respectful relationships. Dixon et al. (2023) highlight the importance for women in establishing positive relationships with their midwife, which involved trust, honouring decisions, and empowerment. They found building these relationships takes time and investment and are supported within a continuity of care relationship. Respectful relationships that were tailored to meet the individuals needs and provided by culturally safe practitioners were also shown to strengthen a person's capabilities as identified in the quality Maternal and Newborn Care (QMNC) framework developed by Renfrew et al. (2014). Communication therefore is an important conduit in the way relationships are established and developed.

Communication technology and particularly texting has changed the way people communicate with one another due to the ability to conveniently and quickly connect and exchange information with another person (Baggio, 2016). Asynchronous communication such as texting and email has been shown to be beneficial for childbearing people in enabling them to connect and access care from their midwife, to seek reassurance and advice (Cummins et al., 2019; Gasteiger et al., 2019; McCarthy et al., 2017; Shroder et al., 2018; K. J. Wakelin et al., 2023). There is convenience for pregnant people in having access to their electronic health information via maternity portals (Forster et al., 2015), as well as for midwives to be able to share information electronically via links or as email attachments (K. J. Wakelin et al., 2023). Virtual connection such as those used by Telehealth have also provided opportunities for people to connect with a healthcare provider especially if living in rural locations or as was shown during the covid-19 pandemic (Manatū Hauora|Ministry of Health, 2021).

Communication technology does present challenges at times for midwives particularly if there is concern around interpretation of text messages, or when pregnant people text for non-urgent concerns outside of work hours (McCarthy et al., 2017; K. Wakelin et al., 2023). To ensure midwives are providing quality care and meeting the needs of pregnant women/people when using communication technology, it is necessary to understand what is important for pregnant women/people when using communication technology when connecting with their midwife. This study aims to address this issue by asking the question, what is important for pregnant women/people when using communication technology to connect with their midwife.

Aim:

This paper will report the findings from interviews with pregnant women/people on how they use communication technology when connecting with their midwife and identify what is important when connecting in this way.

Methods

This study reports on the findings from Phase 2B of a multi-phase study. The multi-phase sequential transformative design uses a theoretical framework to guide the study with data collected from one phase informing the data collected from another phase (Teddlie & Tashakkori, 2009). The guiding framework for this multi-phase study is the Quality Maternal and Newborn Care (QMNC) framework (Renfrew et al., 2014). Questions for the semi-structured interviews were informed by the findings from an online survey with pregnant women/people in phase 1B of the multi-phase study and were conducted FTF using an online platform. Interviews took between 25-48 minutes. Ethical approval for the study was granted by XXXX Ethics Committee (XX 20/279).

Setting

Online interviews using Microsoft Teams with pregnant women/people in New Zealand occurred during September 2022 (two interviews) and May 2023 (three interviews). The difference in timing around collection of data were due to the difficulty in recruiting participants.

Participants

Participants who had previously undertaken an online survey in phase 1B and had expressed interest in participating further in an online interview were emailed an invitation to participate. Two participants from Phase 1B of the study responded to the email invitation. Following a further recruitment drive which included advertising on closed pregnancy Facebook groups within Aotearoa NZ, and through third party (midwives), three further participants were recruited this way. A further email was then sent to participants with information regarding the platform to be used, how to connect along with attachments of the participant form and consent form. A day and time for the online interview was then negotiated. Criteria included:

- at least 20 weeks' gestation,
- at least 18 years of age,

- have access to a mobile phone which has text / email / internet capabilities,
- booked and receiving care with a midwife from at least 14 weeks gestation.

Analysis of data

Thematic analysis was used to analyse the data using a six-step process outlined by Braun & Clarke (2022). This involved: 1) familiarisation with data, 2) Coding, 3) generation of initial themes, 4) developing and reviewing themes, 5) refining, defining and naming themes and 6) writing up. The interviews were video-recorded and transcribed using the online platform function. The transcription was reviewed and amended as needed and then emailed through to participants for verification. Once they were returned, a first read through provided an opportunity to add comments in comment boxes alongside the text. The interviews were then read through again and colour coded for similarity using the colour coding function on Microsoft word. Braun and Clarke (2022), recommend using a coding table to help make sense of the data. A coding table was created to capture segments of data and the coded description. Thirty-two code categories were identified from the coding descriptions during this phase. The coded categories were then reviewed against the research question with potential themes and sub themes developed. Quotes from pregnant women/people were incorporated into the themes and sub-themes and reviewed again. The themes and sub-themes were refined and then emailed through to the first authors supervisors for review. The themes and sub-themes were refined further following comments until the researchers felt the themes were reflective of the data.

Findings

Questions informing the interview questions were based on the findings from the online survey completed by pregnant women/people in phase 1B. Three areas were identified around how pregnant women/people access their midwife using communication technology, how contact is negotiated and privacy concerns. Indicative questions were developed from these areas.

Five participants were interviewed to explore what was important for them when using communication technology to connect with their midwife during their pregnancy. Three themes were identified: 1) Being known enhanced through using communication technology, 2) access and connectedness, and 3) midwife recognised as a professional.

1. Being known enhanced through using communication technology

Being known was important for pregnant women/people and was enhanced through using communication technology within a continuity of care relationship. This is reflected in three sub-themes, two of which highlight the beneficial or positive aspects that are derived from the knowingness within the relationship and involved: 1) respect of midwife, and 2) reassurance and trust fostered through the midwife's use of communication technology. The third sub-theme highlights the implications of not being known within the continuity of care relationship and is identified as 'disconnect through anonymity and being unknown'.

Communication technology facilitates respectful relationships:

The way the pregnant women/people in our study used communication technology to connect with their midwife is highlighted in the respect they had for their midwife. This respect developed because of the knowingness that came about through the continuity of the relationship. Vicki was aware of the on-call nature of the way her midwife worked, and found texting offered a non-intrusive opportunity to connect knowing her midwife would reply when able to.

> *"I just felt more comfortable to send a text message because I know they work all sorts of strange hours. So, if she was in the middle of a birth or sleeping or something…" (Vicki).*

For Fiona, this knowingness and respect went two ways, especially if she had a concern during the night and wasn't sure whether to wake her midwife. She would initially Google her concern to see if it was something that could wait until a more reasonable hour. There was recognition however that not all information obtained online is necessarily reputable or trustworthy and so Fiona would then text the midwife later to double check. In doing so, she respects the knowledge the midwife holds, and trusts the decision making around the episode of care.

> *"Most of the things that have happened to me, either late at night or early in the morning. I don't wanna message that early, so, I Google it and then I'll just send her a text and just double check" (Fiona).*

Participants identified the prescriptive information that midwives provided them around the appropriateness of using communication technology platforms depending on the type of contact or care that was needed. In being known, participants appear to appreciate and respect the choices they have around when to text, or phone.

> *"They did have some guidelines around, if it's an emergency, phone us but otherwise text us" (Vicki).*

Participants appear to value and respect the way the midwife would use the technology to enable the pregnant women/person to feel more comfortable, especially if they had concerns that were quite sensitive. Flo highlights the importance of this knowingness in the way the midwife encouraged her to send an image, which the midwife would then look at when she arrived to enable her to receive the care she needed.

> *"I don't want you to see down there, and she was fine. If you don't wanna do it in person, you can send me a photo or take a photo and I'll look when I come" (Flo).*

Flo further highlights the importance of this knowingness when it came to answering a phone call from her midwife, someone she knew and respected.

> *"If it was from my midwife, I wouldn't feel uncomfortable cause I'd think it was quite important [phone call]" (Flo).*

The participants have highlighted the respect they have for their midwife which is developed as part of a knowingness within the continuity of care relationship. This respect has been highlighted both in the way the pregnant women/people used communication technology to connect with their midwife and from the way the midwife responded to them.

Reassurance and trust fostered through the midwife's use of communication technology:

The way the midwife used communication technology contributed towards participants feeling reassured by the responses. Kelly acknowledges how reassured she felt by her midwife's quick response via text to her message. This quick response was not only reassuring but contributed towards a relationship of trust and knowingness that if the midwife couldn't respond straight away, she would have at least read the message.

> *"She answers texts almost straight away. She's been with me before and I've seen a text, or a call come through and she will always pick up her phone. So that's why I feel quite confident that she always gets my text pretty quick. And if she doesn't reply straight away, I know she's probably seen it" (Kelly).*

Whereas for Flo and Kenya, they trusted their midwife would call them based on the context of the initial text message they sent to their midwife. This phone call provided the necessary reassurance they needed from their midwife, as it enabled a more detailed conversation than is possible through text messaging alone.

> *"But to reassure me, she called me back so that she could explain in detail. So, anything that required further explanation. I knew she would call me" (Flo).*

> *“I had to go to the [clinic] because I was really unwell. She rang me after that because I didn't have a good experience. So sometimes I just text her if I want her to ring me” (Kenya).*

The knowingness and trust that is established is important for pregnant women/people and enables them to connect using communication technology to access care they need. Flo explains the importance of the trusting relationship that enables her to send photos to her midwife which she otherwise may not be inclined to do. While Flo recognises there are some concerns with sending images online, the trust she has with her midwife would appear to over-ride these concerns.

> *“I do have general concerns about what you send over the internet. But with [midwife] there was really no boundaries because I have complete trust and faith that it would be dealt with appropriately or it would never see the light of day for anyone else. I trusted her. But it would definitely be different if I didn't have that relationship with her” (Flo).*

The participants have identified the importance of being known within a continuity relationship and the reassurance and trust that are fostered by the way the midwife uses communication technology, when connecting with them. In contrast, there was a sense of disconnect when participants were initially contacting a midwife who was unknown to them.

Disconnect through anonymity and being unknown:

The participants in our study identified a difference in the way midwives responded depending on whether they were known to them. In early pregnancy when women/people were seeking out the services of lead maternity carer midwives, midwives either didn’t respond or would reply in a manner that participants felt were inappropriate. In being unknown, pregnant women/people were anonymous and therefore possibly less impetus on midwives to respond.

> *"I emailed all of the midwives on the find your midwife website. None of them got back to me" (Kenya).*
>
> *“I sent a text. It was the refusal…I would have preferred a phone call” (Vicki).*

The examples above highlight the importance of the knowingness within a continuity of care relationship. When the pregnant woman/person and midwife are known to each other, the communications and negotiations around connection are respectful, and pregnant people feel reassured by their midwife’s response which engenders a relationship of trust. When the midwife and pregnant women/people were unknown to each other, there was no commitment

to the relationship and therefore a disconnect brought about through the anonymity that comes with asynchronous communication.

2. Access and connectedness

Access and connectedness were identified through the functional way with which communication technology was used to enable the participants to access and connect with their midwife. Three further subthemes were recognised as contributing towards access and connection: 1) space enabling connection, 2) convenience of access and connecting, and 3) flexibility with using communication technology.

Space enabling connection:

There was recognition that texting gave participants space and time in which to reflect and compose a message before sending or responding. This space was important as it removed some of the awkwardness around expectations when having a real-time conversation.

> *"I don't like calling… I always feel like I have to be on my game when I call someone, and I can't be awkward. So, texting or emailing, I much prefer it because then I don't have that constant interaction with someone, and I can think about what I want to say and I and don't feel pressured into trying to keep the conversation flowing" (Flo).*

Fiona was concerned with how she may be perceived by her midwife, so found texting gave her the space needed to compose a message and to portray herself in a more positive way.

> *"I don't wanna come across rude, so by sending a text, that's making sure I'm not coming across rude" (Fiona).*

Fiona explains further the importance of having space and distance when sending a text message. The lack of face-to-face or real time connection provides space, which is perceived to be free from judgement. They can't see how someone is responding to them and so removes the emotional component from the response. For people who may feel awkward within a face-to-face situation, this then enables them to access and connect with their midwife at a different level.

> *"It's a lot easier to ask a question that you may think is stupid through a text and through a screen because you can't hear the persons response… that's why we all prefer texting rather than phone calls. You don't feel any judgement about anything because once you've sent it, you don't see what that person's doing" (Fiona).*

The asynchronous nature of communication technology is important for the participants in our study as it provided space to compose and respond to their midwife. This space enabled participants to connect and access care from their midwife without feeling judged or awkward.

Convenience of access and connecting:

Participants in our study highlighted the convenience that asynchronous communication provided in enabling them to access and connect with their midwife. There was convenience with having text messages written down which enabled pregnant women/people to refer to previous communications they had with their midwife.

> *"We tend to use texting which works well because you still have previous conversations" (Kelly).*

The convenience with asynchronous communication such as texting and email is highlighted by pregnant women/people both in sending messages to their midwife and in messages being received from their midwife. Messages were considered non-intrusive and preferred as there wasn't any expectation of an immediate response as would be expected with a phone call.

> *"It's more convenient. I don't have to make sure I'm free for a phone call or anything. I could just do whatever I'm doing and text or e-mail" (Flo).*

Vicki also found the convenience in being able to text or email for administrative type communications such as rescheduling appointments or if she was running late. In this sense, communications were informative and used to connect briefly without involving lengthy or in-depth conversations.

> *"It was helpful to text for smaller things like rescheduling appointments or letting her know I was running late" (Vicki).*

For Kelly, having an ability to send text messages privately to her midwife was important particularly when at work as it meant there was no risk of being overheard in a conversation.

> *"We've had all these texts at work. Even though works amazing, and they won't hear, I just don't want to look like I'm taking lots of personal phone calls… texting is just a bit easier" (Kelly).*

The convenience with using communication technology has been shown to enable pregnant women/people to access and connect with their midwife in a non-intrusive manner when

needed and thus negate the need for lengthy and potentially time-consuming conversations. The flexibility with which communication technology is used to enable access and connections will be identified below.

Flexibility with using communication technology:

For the participants in our study, accessing appropriate information was important. There was recognition of the myriad of pregnancy websites available and the challenge with navigating appropriate sources. Communication technology provided flexible options for midwives to share information either by texting or emailing through links to reputable sources for further information, or in attaching information through an email.

> *"She texted me links. And she was able to help me find reputable sources" (Vicki).*
>
> *"She would e-mail the links through at the bottom of the notes or whenever she flicked me an e-mail. She always emailed me pretty much straight after appointments" (Flo).*

Or in Kelly's situation, the midwife suggested she take a photo of a poster on the wall which was advertising free acupuncture. The flexibility of smart phones in having camera devices enabled Kelly to conveniently photograph the poster to ensure she had the correct information to be able to access pregnancy services available in her area.

> *"She's also told me to take a photo when I was at a clinic once. She had a poster on the wall for free acupuncture at the hospital, which was so cool" (Kelly).*

Kelly further highlighted the flexibility in being able to access results emailed to her by her midwife when she was overseas.

> *"She emailed through the results. We were talking via e-mail when I was in [Country] so that worked really well because there's no way I would have been able to text her over there" (Kelly).*

While the participants in our study have identified the flexibility with communication technology, in enabling them to access information, they also identified a lack of flexibility when health platforms did not integrate with one another. There was familiarity with the electronic patient portal established through general practitioner practices, however, maternity electronic health systems used by midwives, did not integrate with this system. As a result, there was often frustration when participants tried to access their blood results from their midwife when using this portal.

> *"I use 'Manage my Health' for blood test results. It should be connected into one system, but I know that the health system is unlike that which is annoying. If I go to the GP, he always gives me a blood test and then I can see it. But if [midwife] orders that, I can't see the results and I can't see what she's prescribed either" (Kenya).*

Participants have identified the flexibility with functional aspects that communication technology has in enabling them to access and connect with their midwife. The nature of asynchronous communication has been shown to provide space to enable connections to occur as well as the convenience and flexibility of the technology to enable people to access their midwife and midwifery services. There was however a need identified by the participants for an integrated electronic health system that would improve access to results.

3. Midwife recognised as a professional when using communication technology

When it came to how pregnant women/people were using communication technology, there were two issues identified in recognising the midwife as a professional. The first issue acknowledges the boundaries around using communication technology and the second around privacy of information.

There was recognition by pregnant women/people that certain communication technology platforms or ways of connecting were better suited for certain people/situations. Fiona indicates that while it is important to have a good relationship with the midwife, the midwife was still a professional and not your friend, and therefore boundaries around how communication and connection occurred.

> *"You got to have some sort of boundary. As well as it being a great way for people to connect, sometimes people can connect way more than is appropriate and cross that line of the midwife is the professional and not your friend. I mean you can have a good relationship" (Fiona).*

In a similar way, Vicki alludes to this when commenting about needing to be friends with someone to use social media platforms such as What's App and Messenger. The midwife was recognised as a professional and not as a 'friend' and therefore texting and phone calls with the midwife were deemed easier and more appropriate.

> *"It never occurs to me, to use WhatsApp unless somebody else tells me to use WhatsApp and Facebook Messenger. I feel you have to be friends to message someone... Texting and phone calls seem like the easiest" (Vicki).*

When it came to privacy of information, there was recognition of the professional role the midwife has in ensuring privacy and confidentiality of information. This was acknowledged in the way the midwife would take the time to inform people of what happens with their information, despite the person themselves not being overly concerned about their information.

> *"[Midwife]was reading me all the privacy things and saying everything's confidential…I don't really care. Just tick it. And she went through every single point." (Kenya).*

Both Kenya and Fiona indicated they were not concerned about privacy of their information when using communication technology and couldn't understand why someone might be interested in their information if they could access it.

> *"I don't know what anyone would get hearing about how sick I've been, doesn't worry me" (Kenya).*
>
> *"I don't really mind if people know things. I text a lot with my GP. So, none of that really bothers me" (Fiona).*

The participants have highlighted the difference between the professional responsibility the midwife has in ensuring and protecting pregnant women/people's information, compared with the laissez-faire attitude pregnant women/people have themselves around their own information. It maybe that this has more to do with an acceptance that this is the way people communicate, as Flo indicates, "*It's a given now, that's just how we communicate" (Flo).*

The participants in our study recognised the professional role the midwife had when using communication technology to communicate and connect with them. They indicated there was a potential to over connect when using communication technology, and that there were certain platforms that were deemed inappropriate to use with their midwife given the professional nature of the relationship. The participants also recognised the professional role the midwife has in upholding privacy and confidentiality of the person's information, despite the people themselves not being overly concerned with their own information.

Discussion

The question informing the study was to identify what was important for pregnant women/people when using communication technology with their midwife.

Participants in our study have highlighted how communication technology when used within the context of a continuity of care relationship was important as it enabled the development of

respectful and trusting relationships with their midwife, through being known. This was highlighted in the way pregnant people used communication to message their midwife knowing that their midwife would respond when able to. While there was no expectation around the response time, the response was usually quick providing further reassurance and trust.

Being known was identified as an important component of the continuity of care relationship with the 'midwife/woman' relationship described as being "the vehicle through which trust is built, personalised care is provided, and the woman feels empowered" (Perriman et al., 2018, p. 228). We would agree and add that communication technology could be considered the fuel which assists in driving and enabling these connections and access to occur, thus further contributing towards a relationship of trust. However, when the person wasn't known to the midwife, the participants described the challenges they had when trying to initially find a midwife. In being 'unknown', they were anonymous to the midwives they were trying to connect with, and the midwives were anonymous to the pregnant women/people. There was no relationship developed and therefore less obligation on the midwives to respond. Kegley, (2018) suggests that when there's a lack of direct human contact, the sense of caring or ethical obligation is removed. It is perhaps the distance from this sense of ethical obligation that makes it easier to not respond to someone as there is no 'real-time' connection or investment in the relationship. When someone is 'anonymous', they can hide behind a screen when communicating (*or not)* with others asynchronously, or perhaps portray themselves in a way that they wouldn't normally do because they are 'hidden' (Baggio, 2016).

In contrast to the negative connotation associated with 'being hidden', was the protective space that was afforded by being hidden behind a screen. For Fiona, this provided her an opportunity to not only ask questions, but to have space to compose and respond to a text message without fear of being judged. Flo alludes to this in a similar way when commenting on the discomfort she has with phone calls and the anxiety with having to keep a conversation flowing. Having space to compose a message provided the participants an opportunity to present themselves in a positive manner. This ability to create a persona within an electronic environment has increasingly developed through the asynchronous non face-to-face connections enabled through communication technology (Allred & Atkin, 2020; Floridi, 2014).

The participants in our study were empowered by their use of communication technology when connecting with their midwife, and therefore able to access the care they needed. This was highlighted further through the convenience and flexibility of the technology that

supported these connections and enabled participants in our study to connect in a non-intrusive manner. They could choose whether to send a quick message to update their midwife, reschedule an appointment or ask the midwife to call them. The convenience of text messaging a midwife have similarly been reported in other studies (Gasteiger et al., 2019; Shroder et al., 2018). Kelly further identified how texting enabled her to have a private communication with her midwife without fear of being overheard by work colleagues through a phone conversation. While Baggio (2016), suggest that privacy is one of the main reasons people choose to text, what Kelly identified was the importance of this privacy in being able to quickly check in and be reassured by her midwife's response.

The negotiations and prescriptive information that the midwife shared with pregnant people further enabled the participants to understand when texting was appropriate and when a call was required instead. While the participants in our study appeared to respect the guidance their midwife offered around the appropriate use of communication technology, this is in contrast to the authors previous survey findings with midwives where concerns about potentially missing something were identified when pregnant women/people texted instead of calling for urgent concerns (XXXX, 20XX).

There was recognition that the midwife was a professional and not a friend when using communication technology. As a result, texting and email were appropriate communication platforms to use rather than using other forms of social media. This however, differed to the authors previous survey findings where inappropriate forms of communication technology and lack of boundaries were of concern for midwives (XXXX, 20XX), and where clients have contacted health professionals using their personal social media accounts (Basevi et al., 2014). The authors acknowledge that the findings from our study are limited with the reporting of experiences of five pregnant women/people which may account for the difference between the two studies.

Another area where there was a perceived difference between midwives and pregnant women/people was around the protection and privacy of information. The participants in our study acknowledged the professionalism of midwives in ensuring privacy of their information, however for the pregnant people themselves, there was a lack of concern around why anyone would want to access their information. This lack of concern around people's storage of electronic health information has similarly been reported in other studies (Esmaeilzadeh & Sambasivan, 2017; Hadland et al., 2022). A possible explanation could be in the devolving of cyber security responsibility to health organisations responsible for ensuring safety of

electronic health information. Zwilling et al. (2020) identified this as a finding in their study when comparing cyber security awareness, knowledge, and behaviour of university students in Israel. While the study participants characteristics differ to those of our study, it offers a possible explanation around the lack of concern for private health information stored electronically.

A similarity that was identified by the participants in this study with the authors previous study with midwives was around the need for an integrated electronic health system (XXXX, 20XX). Pregnant women/people were comfortable accessing electronic notes through their general practitioner patient portal which supports the findings from Elers and Nelson (2018), however, there was frustration and annoyance at not being able to access results from their midwife in the same way. While the participants in our study have identified an area for further development, there have been concerns identified around who would have access to a person's private health information and whether it could be adequately protected (Kisekka & Giboney, 2018; Papoutsi et al., 2015). While these concerns would require careful consideration, there seems a general acceptance that when people perceive health information technologies as being beneficial to care, it is more acceptable to them (Kisekka & Giboney, 2018).

Limitations:

Due to the length of time between analysing the findings from the online survey in Phase 1B to the interviews in phase 2B, two of the participants were no longer pregnant. While participants were asked to consider their responses during the time, they were pregnant, recall may not be as accurate as data obtained from the later participants who were in the third trimester of their pregnancy. Nevertheless, there is valuable information that has been obtained from the participants that can help to inform midwifery practice going forward.

Conclusion:

Pregnant women/people have identified the importance of being known when using communication technology within a midwifery continuity of care relationship. This knowingness contributed towards a relationship of trust which was reflected in the respectful ways that empowered participants to make choices around how they used technology to connect with their midwife. The flexibility and convenience of communication technology was further enhanced through the reassurance provided to participants by the midwives' response,

and in being able to privately connect and communicate with their midwife. However, there is a need for electronic health systems to be integrated to enable easier and more convenient access to client information.

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Chapter 10

Discussion:

Introduction

This PhD thesis set out to explore how communication technology was used between LMC midwives and pregnant women/people. The research was undertaken over two phases, which resulted in the publication of six papers, one paper accepted for publication and a further two papers under review for publication. There was little information on how midwives use communication technology with pregnant women/people, and how this contributes towards quality maternal and newborn care. This became the focus for this PhD research. In this chapter, the discussion of the findings between phase 1 (online survey) and phase 2 (online face-to-face interviews) will be interwoven using the QMNC framework. There are two aspects to this discussion. The first considers the effectiveness of communication technology and how it contributes towards quality maternal and newborn care. The second identifies challenges LMC midwives and pregnant women/people found with using the technology. The contributions this PhD research has made will be outlined along with limitations, recommendations, and areas for further research both within the field of midwifery and in communication technology.

Significance of the study

This PhD research is significant. For the first time, this research has shown how communication technology works within and supports the continuity of care relationship developed between the LMC midwife and the pregnant woman/person. Continuity of care is at the heart of the relationship that is developed between LMC midwives and pregnant women/people. Communication technology facilitates and enhances this further through the flexibility and convenience of the technology in providing space which supports connections. It is valuable in enabling LMC midwives to manage their work/life balance which is crucial for the sustainability of midwifery practice. It supports respectful connections through the knowingness that comes within the continuity of care relationship, and importantly, contributes towards quality care through enabling safe and effective communications which continuity of care in and of itself could not do without the technology. The example of a pregnant woman texting her midwife while an abusive partner slept in another room, at the same time as the woman and midwife were verbally having a conversation, highlights the effectiveness of communication technology in enabling parallel communications to occur. It was the effectiveness of the communication

that was built around a continuity of care relationship that enabled communication technology in this instance to succeed. It is the significance of communication technology used in this way that contributes towards quality maternal and newborn care.

Contributions to midwifery body of knowledge

This PhD research has made several contributions through published papers, and papers under review for publication from each phase of the research. These contributions are to the best of my knowledge, the first to highlight how communication technology contributes towards quality maternal and newborn care, viewed through the lens of a midwifery model of continuity of care. There were further contributions made in the methods used in conducting each phase of the research.

Phase one of the research resulted in four publications. The first publication was an integrative literature review that systematically reviewed the literature around communication technology use. Two significant gaps in the literature were identified. The first around how communication technology was used between LMC midwives and pregnant women/people and the second, in how technology is used within a midwifery continuity of care model. The findings from this integrative literature review and the categories from the QMNC framework were then used to develop questions for the online surveys in phase one of the research.

The second publication made a significant contribution in assessing the reliability and validity of questions for use in online surveys. The publication of this paper in the International Journal, Methodological Innovations, recognises and values the knowledge and expertise of midwives and gave voice to midwifery which has traditionally been marginalised by more patriarchal research paradigms.

The third and fourth publications in international journals report on the findings from the surveys with LMC midwives (in the journal 'Midwifery') and pregnant women/people (in the journal 'The Practising Midwife'). These publications highlight how communication technology contributes towards quality care through enabling pregnant women/people to use a variety of platforms to connect with their midwife, and to ask questions that they may not feel comfortable asking face-to-face. For LMC midwives, communication technology enabled them to use their time efficiently through screening and care planning, and to support documentation of events. Midwives however identified concerns they had with the potential for missing or misinterpreting messages, and the expectation that they always needed to 'be connected'. Because of this expectation of being 'contactable', the communication technology added another layer of complexity around midwives managing their work-life balance, and in

managing inappropriate modes of communication especially when pregnant women/people text their midwife with urgent concerns. Midwives described feeling anxious about the potential fallout regarding complaints to Midwifery Council especially if they missed something. The significance of the findings from phase one, meant that the issues identified could be explored further during interviews in phase two.

Phase two of the research resulted in three papers being published or accepted for publication with a further two papers are under review for publication. The first of these published papers (discussed in chapter seven) make a valuable contribution in the use of online face-to-face interviews as a valid research tool when conducting qualitative research. The insights gained from conducting video-recorded interviews using an online platform were beneficial particularly when transcribing and analysing data. These insights have led to a recommendation for further research into this area.

In the online interviews with LMC midwives and pregnant women/people, the remaining four papers have either been published, accepted for publication or under review for publication (and discussed in chapters eight and nine). They highlight how communication technology contributes towards quality maternal and newborn care. These contributions are made through identifying the importance of being known within a continuity of care relationship, the flexibility and convenience of the technology in enabling connections and sharing of information, and the importance of space in enabling connections.

Research design which gives voice to participants

The mixed methods multi-phase sequential transformative design has enabled the findings from the studies in phase one and two to be built on over the course of the PhD thesis. The online survey in phase one provided a description of how LMC midwives and pregnant women/people were using communication technology to connect with one another and offered glimpses into providing an explanation for responses through qualitative comments. Phase two provided an opportunity to further delve into the issues identified from the online survey in phase one and enabled the voices of LMC midwives and pregnant people to be heard. As discussed in chapter three, “a transformative lens ensures improvement in human interests and society through addressing issues of power and social relationships” (Sweetman et al., 2010, p. 441). The publication of the papers which have formed this PhD thesis highlight how the voices of LMC midwives and pregnant women/people have been heard which is in keeping with the transformative lens.

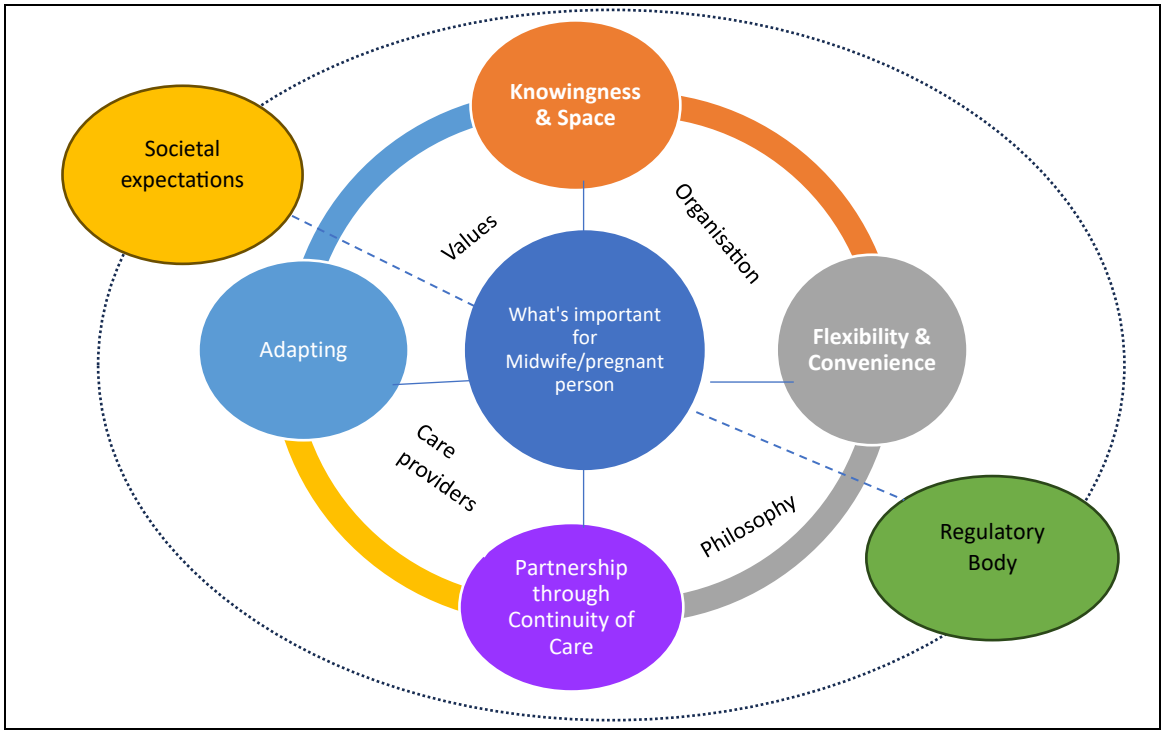
There can be challenges involved with the mixing and bringing together two sets of data that have been collected in paradigmatically different ways (Sakata, 2023). The QMNC framework, however, offered an opportunity to map the findings to the components of the framework and in doing so, identified effective ways with using communication technology along with challenges to how the technology was being used. When using the framework as a theoretical guide, O'Dwyer (2004) suggests *'there is a temptation to 'cherry pick' … to try and make descriptions "fit" into the lens being used'* (p.403). The framework while initially used as a guide, was helpful in developing questions for phase one of the study, an online survey with LMC midwives and pregnant women/people, as very little was known about how they use communication technology when connecting and communicating with one another. Moving into the second phase of the study, interviews with LMC midwives and pregnant women/people, the focus was on the issues that had been identified by LMC midwives and pregnant women/people. The discussion of these findings from the two phases of the study and how they map onto the QMNC framework follows.

Mapping the findings to the QMNC framework

The QMNC framework developed by leading midwifery researchers is the theoretical framework used to guide this study (Renfrew et al., 2014). The researchers identified characteristics that were needed to ensure quality maternal and newborn care, which supported a model of continuity of midwifery care. These characteristics were identified as 1) practice categories (which identify what is important for childbearing women/people, 2) philosophy of care, 3) values, 4) organisation of care, 5) characteristics of care providers. While the categories identified in the QMNC framework are supported with how LMC midwives and pregnant women/people use communication technology, there was cross-over between the categories which makes it difficult to discuss each category on its own.

The use of communication technology within the QMNC framework is not a linear process and instead could be described as more like a wheel with interconnecting spokes and yet when viewed together, provide a whole that contributes to quality maternal and newborn care. Figure one depicts the interconnectedness with how the categories from the QMNC framework interrelate to the findings from the studies with how LMC midwives and pregnant people use communication technology to connect with one another. If one of these spokes is missing, the wheel would become lopsided. But just like a wheel, cannot be viewed in isolation, with outside influences potentially impacting on how the wheel moves.

Figure 1: Wheel depicting relationship between use of communication technology and QMNC framework



At the heart of the wheel, is the midwife and pregnant woman/person. Each aspect of the model is directly connected to them to emphasise the importance of the relationship. The Philosophy relates to the partnership model which underpins interactions between LMC midwives and pregnant women/people within this continuity of care relationship. Organisation of care relates to the flexibility and convenience of communication technology and how it is used to ensure access to care. The value of communication technology is expressed through the importance of being known and in the space that is provided when communicating in an asynchronous manner. This knowingness is aided through a continuity of care relationship that enabled midwives to tailor responses to their pregnant clients because of the knowledge they had of them. Equally, pregnant people knew their midwife and used technology to communicate in a respectful manner. They also felt reassured through the responses provided to them by their midwife. Care providers relates to the measures midwives go to in adapting and seeking support in how they can best use the technology. When identifying what was important for pregnant women/people when using communication technology, there were common features within each of the categories that were important. Because midwives work in partnership with pregnant women/people, it also became apparent from the findings of the

studies, that what was important for pregnant women/people in how technology is used, was also coincidently important for midwives.

There were findings however, that challenge the use of communication technology within the QMNC framework and are depicted in the model as spheres rotating around the outside of the wheel but connected through a dotted line. The spheres reflect the dissonance that occurs with regulations as set out by Te Tatau o te Whare Kahu|Midwifery Council of New Zealand and societal expectations with using communication technology. The challenge for midwives is how to navigate the 'norms and expectations within society' and regulatory body requirements which at times are at opposing ends of the spectrum. The function of the regulatory body is to 'keep the public safe'. However, when communication technology practices are used by pregnant women/people that midwives perceive as being not appropriate, then this is where the challenge arises. Despite these challenges, midwives have taken a 'solution focussed' approach by using the technology to bridge this gap, and to ensure quality maternal and newborn care. A good example of this was in the way LMC midwives used autoreply messages to ensure the pregnant woman/person was always able to contact the midwife or a back-up midwife.

The effectiveness of communication technology in contributing towards quality maternal and newborn care:

In Aotearoa NZ, midwives work in partnership with the childbearing woman/person from early pregnancy, through labour and birth and up to six weeks postnatally (Guilliland & Pairman, 1995; Midwifery Council |Te Tatau o te Whare Kahu, n.d.-b; New Zealand College of Midwives, 2015). A common finding from the interviews with LMC midwives and pregnant women/people was in the importance of being known. 'Being known' is brought about through a midwifery model of continuity of care and as such is ''*holistic by nature: combining an understanding of the social, emotional, cultural, spiritual, psychological and physical"* aspects of a person (New Zealand College of Midwives, 2015). It was this knowingness that came about through the continuity of the relationship that enabled midwives to use the technology to connect and adapt if necessary to meet the needs of their pregnant clients. The actions of the midwives in enabling these connections and using platforms that pregnant people are comfortable with is supported from findings in a recent satisfaction survey undertaken in NZ on people's experiences and perceptions of the maternity and perinatal system (Research New Zealand, 2023). Tailoring information content and using platforms that appeal to younger birthing parents was important for improving communications (Research

New Zealand, 2023). Gagnon & Sabus (2015)also support the need for professionals to adapt to meet the expectations and needs of clients in improving connections and communications. However, they equally recognise the challenges for health professionals in doing so when considering the privacy of information within online platforms (Gagnon & Sabus, 2015).

In the online survey with pregnant women/people, one of the issues identified was an apparent lack of concern around privacy (K. Wakelin, McAra-Couper, & Fleming, 2023). This issue was able to be explored further and highlighted the importance of trust that is developed within a continuity of care relationship. Pregnant people trusted that their midwife would protect their privacy even though pregnant people were not overly concerned themselves. There was an inherent trust with the protection of information which is held in electronic data bases. While there was an awareness around privacy issues in relation to sending photos, the trust that people had with their midwife, and the professional role of the midwife overrode any potential concerns with privacy of their information. While the Privacy Commissioner in his latest report identified that trust is built with people "when agencies and businesses put privacy at the heart of how their organisations operate" (Webster, 2023, p. 8). In this PhD study however, it was the 'trust of the person [midwife]' which led to pregnant people trusting that their information would be protected. This trust came from a knowingness that had been developed through the continuity of midwifery care relationship.

Valuing:

Within the QMNC framework, Renfrew et al. (2014) identified value as one of the categories that was important in ensuring practices were effective in meeting the needs of women. The value of using communication technology between pregnant women/people and midwives was identified in several ways. The functionality and asynchronous nature of communication technology provided space to consider and compose messages. This space was valuable and important for both midwives and pregnant people alike. This space was empowering for pregnant women/people in enabling them to connect and seek the necessary support from their midwife. For midwives, this space enabled them to take time to review the person's notes before responding, and in doing so, were able to tailor and individualise the response that was needed. Having the space to respond and consider messages is in keeping with other literature that has identified advantages when using asynchronous communication (Forgays et al., 2014).

This space also removes some of the emotional context which make connections easier for people who find it difficult, who are anxious, or socially awkward when communicating in 'real-time' or face-to-face (Allred & Atkin, 2020; Biglbauer & Korajlija, 2023). Midwives identified

that in some situations, they would obtain more information from their clients via text than what they would face-to-face or over the phone due to the anxieties some people have when communicating in real-time. In having this awareness of their pregnant clients, midwives would negotiate to use the technology that their clients felt comfortable using. This again reiterates the importance of insuring communications and mode of communication meets the diverse needs of the childbearing person (Research New Zealand, 2023).

Another valuable contribution highlighted through using communication technology was the ability to use the technology to alert another person to an unsafe situation through parallel communication. Kneidinger-Müller (2017) have referred to parallel communications as "*usage of smartphone to communicate with absent people during face-to-face interactions with people who are physically present*" (p. 329). However, one of the midwives in the study highlighted a completely different 'parallel communication' where a texting conversation took place at the same time as a verbal conversation with a pregnant client while they were both physically in the 'same space'. The texting communication was able to alert the midwife to an unsafe situation, with a violent partner who was in another room. Navigating threats and uncertainty was identified in a similar study undertaken in Aotearoa New Zealand where midwives were at times exposed to high risk or threatening situations (Neely et al., 2022). This highlights the valuable role that communication technology can potentially play towards ensuring access to safe care, in other situations, both within and outside of health/maternity situations.

The flexibility and convenience of communication technology in ensuring access:

The flexibility of communication technology was highlighted by both midwives and pregnant people through the availability of platforms that could be used by pregnant people to access and connect with one another. Midwives identified the inherent value in the flexibility and convenience of communication technology that ensured pregnant women/people were able to access and connect with their midwife. This connect-ability involved midwives setting up autoreply responses to text or voice messages on their phone. This was in recognition not only of the unpredictable nature of midwives' work, but also in recognition of society's expectations around the need for quick responses and to be able to connect with someone 24/7 (Kneidinger-Müller, 2017). Edstrom & Ewald (2017), identified strategies that are used by people in establishing autoreply responses to emails, one of which, is to provide referral information on who a person can contact for further support. This is equally important for text messages as was identified by both the pregnant women/people and LMC midwives. Crafting the right autoreply has been found to be important when sending and receiving autoreply messages because of the reassurance that is provided to the sender and receiver of the

message (Jain et al., 2019). Another advantage is the ability to create and pre-emptively send one message to a group of people at one time (Balubaid et al., 2015). This ability for midwives to send a 'group message' to their clients was a quick and efficient way to communicate that they were going to be away or off-call. They could create the message as they would for an autoreply, providing contact details on who to access if support is needed. This was important for both pregnant women/people and LMC midwives as it provided reassurance. For the pregnant woman/person, this reassurance instilled further trust with their midwife knowing they would respond when able to or would know who to contact. For LMC midwives, having an ability to create the autoreply response was 'groundbreaking' as it provided them with not only the reassurance that pregnant people were receiving a response, but also helped the midwife to create a more sustainable work/life balance.

Midwives and pregnant people both identified the value in having asynchronous messages such as text or email messages written down. While pregnant people found it valuable to refer to messages or information that had been shared electronically by their midwife, for the midwife, the value was in the flexibility and convenience of the technology to not only share information in this way, but to also then upload information into an electronic maternity health system as part of documentation. Midwives first alluded to the value communication technology had in 'capturing' the written text and identifying this as proof of information shared in the online survey. In the interviews with midwives, further information was provided which explained how communication technology supported documentation of events through the ability to screen shot text messages and add as an attachment to the maternity electronic notes system. This information was then available for pregnant people to refer to. In a sense, 'closing of the communication loop' to ensure effective communication, and therefore quality care (World Health Organization, 2016). However, challenges were identified both by pregnant women/people and midwives with the lack of integrated electronic health systems across various aspects of healthcare.

The findings from the studies have identified aspects of communication technology that contribute towards quality maternal and newborn care, through highlighting the value, and flexibility of the technology, and in the way, midwives have adapted to the technology to enable connections to take place. There were aspects with using communication technology that provided challenges for both midwives and pregnant women/people. These challenges however offer opportunities to further advance the way technology can be used to ensure access and quality care and will be discussed further.

The challenges to using communication technology within the QMNC framework:

The importance of being 'known' and the challenge with being unknown was highlighted by pregnant women/people trying to find a midwife at the beginning of their pregnancy. Text messages and phone calls would go unanswered as the pregnant woman/person was unknown to the midwife. There is currently a midwifery workforce crisis within NZ (Te Whatu Ora|Health New Zealand, 2023b). This coupled with the ubiquitous use of asynchronous communication along with expectations for responding in a timely fashion could leave midwives feeling overwhelmed and unable to physically respond to all communication (A. Lee et al., 2016). A solution is needed therefore in enabling pregnant women/people to be able to contact an LMC early in their pregnancy as better outcomes for both the pregnant woman/person and their baby are associated with early access to antenatal care (Wong Shee et al., 2021).

Societal expectations

Floridi (2014) when discussing communication technology, highlights how it has not only changed the way people communicate with one another, but has also changed the way we are when we communicate. This societal shift in changing communication practices has developed because of the ease and convenience of the technology, and the adoption of new technologies into normal life. We only need to look at what is happening with the artificial intelligence (AI) sector to see the potential role this may play within the maternity care setting. Artificial Intelligence generated responses have been used in medical online chat forums in response to increasing needs of patients in a workforce shortage (Jahanshahi et al., 2022). However, ethical considerations are required when considering AI responses are based on algorithms, which remove the 'human' factor and therefore could have implications on quality and safety of care (Çitil & Çiti Canbay, 2022; Fiske et al., 2019; S. O'Connor et al., 2023).

Role of the Regulatory body

The role of Te Tatau o te Whare Kahu|Midwifery Council is to keep the public safe which it does through taking '*proactive measures to prevent harm, intervene early when an issue is raised, and apply the appropriate actions to improve safety'* (Te Tatau o te Whare Kahu|Midwifery Council, 2023, p. 1). There has been recognition of the changing culture around communication technology by Te Tatau o te Whare Kahu|Midwifery Council with its publication and information provided to midwives on texting (Midwifery Council |Te Tatau o te Whare Kahu, 2016). While this information provides guidance around how and when texting or phone calls should be used, it doesn't remove the anxiety and frustration midwives feel when technology

is used by pregnant people in ways that midwives consider to be inappropriate and unsafe as was highlighted in the online survey. LMC midwives appear therefore to feel unsafe and unsupported because of the perceived regulatory and disciplinary role of Te Tatau o te Whare Kahu| Midwifery Council within the communication technology space despite taking measures to negotiate best ways to use the technology to contact the midwife (K. Wakelin et al., 2022). This PhD study has highlighted a divide between health regulatory expectations and societal expectations around how communication technology is used, and the need for research in this space to explore the issue further. Technology is only going to become more advanced, and so there is a need to ensure that midwives feel safe and supported with effective guidelines in place to support how they use the technology in the future when communicating and connecting with their clients.

Implications for practice

The findings from the LMC midwives and pregnant women/people have highlighted how communication technology can be used effectively when used as part of a communication tool. There is a need for negotiation around how the technology is being used, and when there is, results in respectful and considered communications. Communication technology has been shown to contribute to quality care through the ability to connect pregnant people to midwives using a variety of platforms to enable care to be accessed. The ability to use technology to consult with colleagues, or to access colleagues via video links highlights a need to further advance the use of Telehealth operations, and the need for midwives to be part of this process.

An important and significant finding from the study is the way technology has assisted midwives in finding a balance between work and personal space. The technology has an important part to play as sustainability and work/life balance is crucial in ensuring midwives can sustain themselves and continue to provide the continuity of care model that midwives fought so hard to achieve more than 30 years ago (Department of Health, 1990). While some midwives found communication technology had intruded into their work-life balance with people messaging them at any time of day or night regardless of the urgency of the message, others have shown how this technology can be used to provide this balance.

Midwives have identified their resourcefulness in developing strategies around ensuring their pregnant clients are able to access the care they need. They used the technology to enable sharing of information to support in-person assessments and to tailor and individualise these communications to the person. This in part has come about through ‘knowing’ their pregnant clients within a continuity of care relationship. Having the information written down also

meant it was easily accessible for pregnant people and could be attached to electronic notes for future reference.

Just as midwives found solutions with the technology itself to assist them in ensuring accessibility for their pregnant clients, so too has the technology presented solutions and opportunities in the way this PhD research was conducted. Within the uncertain context of Covid-19, undertaking video recorded face-to-face interviews using an online platform provided insights around the valuable contribution technology can play within the field of qualitative research. The significance of this finding has resulted in a published paper with the International Journal of Qualitative Methods.

Recommendations

There are several recommendations to come out from this PhD research. The first two recommendations came directly from the LMC midwives and pregnant people themselves. In this sense, it aligns with the transformative lens for the PhD study, in enabling the voices of the participants to be heard. Addressing the recommendations will go some way in helping to improve access to quality care. In doing so, will help meet the Te Pae Tata health action plan which outlines the steps needed to ensure health services meet the health and wellbeing needs of people within communities regardless of who they are or where they live (Te Whatu Ora |Health New Zealand, 2023).

- ***Recommendation 1.***

  Integrate electronic health systems across all aspects of healthcare.

The need for an integrated electronic health system that incorporates both electronic data from the person's medical notes as well as their maternity notes was a recommendation from both LMC midwives and pregnant women/people. There are a variety of electronic health systems that are currently being utilised within Aotearoa NZ. The Aotearoa Perinatal Spine is a secure information system which was introduced in NZ in August 2023, with a role out to all maternity providers expected by mid-2025 (Te Whatu Ora|Health New Zealand, 2023a). This system is expected to integrate across the variety of electronic maternity systems to enable better sharing of information and to reduce delays through duplication. This will go some way to addressing the frustrations identified by both the LMC midwives and pregnant women/people in this PhD research however, there is still uncertainty whether this will integrate with other electronic health systems such as patient portals offered through general practitioners. An integrated system might help to prevent confusion and frustration for pregnant women/people in accessing their notes. While considerations are needed around

who would have access to a person's private health information and how this can be adequately protected (Papoutsi et al., 2015), there is evidence to suggest that when people perceive benefits to care, they are more accepting of technologies (Kisekka & Giboney, 2018). This would certainly appear to be the case for the LMC midwives and pregnant people in this study and therefore a strong argument for integrating these health technologies.

- ***Recommendation 2.***

  Funding of LMC midwives living in rural locations with satellite phones.

The second recommendation to come out from this study is the need for rural midwives to be funded satellite phones to ensure accessible communications. Examples were highlighted by LMC midwives of the importance in being able to connect especially in an emergency to other health professionals and particularly when living in remote rural regions of NZ. There is recognition, that despite the progress towards ensuring access to broadband and mobile coverage, there will still be a very small proportion of the population, where these services will not be available (New Zealand Health and Disability System Review, 2019). Therefore, a satellite phone could go some way to ensuring these vital connections.

The following four recommendations have developed from the findings of the research.

- ***Recommendation 3:***

  Provision of pregnant women/people living in rural locations with satellite phones.

This recommendation follows on from the previous recommendation. Pregnant women/ people who live in remote rural regions to be provided with satellite phones to ensure they can access and connect with their LMC midwife. This phone could then be returned to the midwife once the person is discharged from midwifery care.

- ***Recommendation 4.***

  Establish a 'Midwifery Healthline'

Given the difficulties pregnant women/people identified in initially accessing a midwife, establishing a 'Midwifery Healthline' which is set up in a similar way to 'Healthline NZ' could be a possible solution (Manatū Hauora|Ministry of Health, n.d.). It is important that this midwifery Healthline is facilitated by experienced midwives who can provide pregnancy advice as well as link pregnant women/people to a point-of-contact midwife within local communities for those having difficulty accessing an LMC midwife.

- ***Recommendation 5:***

  Establish a 'real time' webpage for midwives to add to or access information on communication technology resources to assist with maintaining work/life balance.

As technology advances, there is a need to ensure that LMC midwives are keeping up to date with communication technologies. LMC midwives in this PhD study identified trialling different technologies until they found one that suited them when setting up systems to assist in maintaining work/life balance. It was an 'adhoc' process, and often spread through 'word of mouth'. Establishing a 'real-time' webpage where midwives can add technology resources, they have found useful could be a valuable tool for midwives who are uncertain where to go or what to use. This could also be useful information to share with new graduate LMC midwives as part of their Midwifery First Year of Practice (MFYP) programme. The MFYP programme is Government funded to support new graduate midwives in NZ with a mentor, education, and practice advice during their first year of practice (New Zealand College of Midwives, n.d.).

- ***Recommendation 6:***

  Increase funding to support Telehealth services.

An increase in funding is needed to support Telehealth services particularly in rural areas. There have been significant events over the last few years with Covid-19 and adverse weather events that highlight the necessity for access to Telehealth services. On the 14th of February 2023, a 'State of National Emergency' was declared in response to Cyclone Gabrielle which impacted six regions of Aotearoa New Zealand (McAnulty, 2023). Physical access in and out of the regions were impeded through this catastrophic event. While initially telecommunications were downed due to the events, these were instilled quicker than the physical access in and out of the regions. In these situations, Telehealth or video technology services would have a larger role to play than just supporting connections between LMC midwives and their clients.

LMC midwives in this PhD study identified the benefits in having 'real-time' support via video technology with colleagues in an emergency, particularly within a rural environment. A large study conducted in Australia during the Covid-19 pandemic where nearly 46% of in-person antenatal appointments were replaced with Telehealth services, was found to have no adverse effects on perinatal outcomes (Thirugnanasundralingam et al., 2023). Therefore, funding for increased Telehealth services would mean better access to people who are unable to access in-person-face-to-face care.

- ***Recommendation 7:***

  Te Tatau o te Whare Kahu\|Midwifery Council is to include a statement within the competencies that requires practitioners to demonstrate competence in the use of communication technology that supports practice.

The findings have shown there is a need for midwives to be competent in the use of communication technology to support practice. LMC midwives provided examples in this study

of how communication technology can be used to enhance quality maternal and newborn care. In addition, Pre-registration standards would need to be reflective of this to help inform pre-registration programmes.

- ***Recommendation 8:***
  LMC midwives to use a designated phone/computer for work that is separate from personal use.

A designated phone/computer for work which is separate to personal use would ensure images/photos sent from clients are not unwittingly downloaded onto the midwife's personal photo gallery. Midwives have a responsibility under the Privacy Act (2020) to ensure they are protecting their client's personal information and have an obligation to report privacy breaches to the Office of the Privacy Commissioner if a breach has or is likely to cause serious harm (Privacy Commissioner|Te Mana Mātāpono Matatapu, 2020).

Areas for further research

The voices from LMC midwives and pregnant women/people have identified both effective and ineffective means with which communication technology has been used to enable connections with one another. While this PhD study has provided answers and solutions to how communication technology can contribute towards quality maternal and newborn care, further research is now needed to explore:

- maternity stakeholders' perceptions on how communication technology can contribute towards quality maternal and newborn care and how midwives can be supported to navigate the challenging divide between regulatory body expectations and those of society,
- the role communication technology in ensuring safety within the context of intimate partner violence,
- the experiences of childbearing people and midwives who work in a non-continuity model of care,
- the role Telehealth services plays within the maternity setting,
- how communication technology can be used to meet the needs of different ethnicity groups within Aotearoa NZ,
- how communication technology can be used to meet the needs of people within the disability sector,
- researchers and participants experiences' with using an online format to conduct face-to-face interviews,

- the role of artificial intelligence within the maternity sector.

Limitations

There were several limitations within this PhD study. One such limitation was focussing solely on how communication technology is used between LMC midwives and pregnant women/people. It is unknown whether the experiences identified by LMC midwives would be similar or different to other community-based midwives aligned with hospitals, or whether there are different issues for midwives when connecting with labouring or postnatal clients.

While this PhD thesis has resulted in several publications, there are limitations with how these publications were written. For example, the findings from the interviews with midwives were presented over three papers due to the word limit criteria within journals. To have compiled all the findings into one article as was requested by some reviewers, would have meant dilution of the voices and experiences of midwives would have occurred. For this reason, the decision was made (and supported by my supervisors) to present each of the themes as one paper.

There were also limitations around the recruitment of participants, particularly pregnant women/people. With the ubiquitous postings on Facebook pages, the posts advertising to participants may have been quickly overtaken by newer posts. It is also possible that pregnant women/people do not see the way they communicate with their midwife using technology as being of interest given the technology is what they have grown up with and what they know.

A further limitation is around the length of time between the different phases. Pregnant people who took part in the online survey, were no longer pregnant at the time of the interview. The participants had indicated their interest in taking part in an interview, so after discussion with my supervisors, it was agreed to include them but ask them to reflect on their experiences while they were pregnant. It is recognised that their recall may not be as accurate as information obtained from the later participants who were in the third trimester of their pregnancy. Nevertheless, valuable information was obtained from the participants that can help to inform midwifery practice going forward.

There is recognition that specific issues relating to different ethnicities or people with diverse needs within the disability sector may have implications on the way communication technology is used. While these issues weren't addressed by participants in this PhD research, further exploration around this area is needed, and is a recommendation for further research.

Conclusion

This PhD research sought to answer two questions around how communication technology was being used between LMC midwives and pregnant women/people, and how it contributed towards quality maternal and newborn care. This research has shown that communication technology does contribute towards quality maternal and newborn care, both in enabling access and connection between LMC midwives and pregnant women/people and in the ability to assist midwives with strategies for maintaining their work/life balance. Communication technology is very much a part of our social and cultural ethos, in the way we communicate with one another. While communication technology compliments the relationship that is developed between LMC midwives and pregnant women/people, more work is needed with supporting midwives to manage societal expectations with the way communication technology is used and expectations from Midwifery Council as the regulatory body charged with keeping the public safe. These challenges will not be unique to midwifery and therefore the results of this PhD research may have value for other health professional bodies who are also navigating this communication technology space.

Recommendations for how communication technology can be used to further improve access to services as well as identify areas for further research have been identified. This PhD research has shown how communication technology can be part of the solution in contributing towards quality maternal and newborn care.

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Appendices

Appendix A: Copyright Permissions

Appendix A.1: New Zealand college of Midwives

FW: Permission to include published work in PhD thesis

Annie Oliver <editassist@nzcom.org.nz>

Thu 9/11/2023 9:19 AM

To:karen.wakelin@autuni.ac.nz <karen.wakelin@autuni.ac.nz>

Kia ora Karen,

Thank you for your email regarding the copyright of your article published in the New Zealand College of Midwives Journal:

> Wakelin, K., McAra-Couper, J., Fleming, T., & Erlam, G. (2022). Exploring the ways communication technology is used by midwives and pregnant women/people: An integrative review. *New Zealand college of Midwives Journal, 58,* 11-18 https://doi.org/10.12784/nzcomjnl58.2022.2.11-18

Lesley Dixon is on leave at the moment and has asked me to respond to you, saying that we are happy for you to include this in your thesis. Our policy around copyright for Journal articles is:

- Papers that are accepted and published in Te Kāreti o nga Kaiwhakawhanau ki Aotearoa | the New Zealand College of Midwives Journal become the copyright of the Journal. Please see the following table, which outlines the subsequent rights of authors.

New Zealand College of Midwives Journal Copyright agreement **This agreement allows authors to share their work in the following ways, providing it remains attributable to the New Zealand College of Midwives Journal**	
Read, print and download	✓
Redistribute or republish the final article (e.g. display in a repository)	✓
Translate the article	✓
Download for text and data mining purposes	✓

Re-use portions or extracts in other works	✓
Sell or re-use for commercial purposes	X

I trust this is all you need, Karen, and we wish you all the best with your thesis. If there's anything else I can help with, please let me know.

(And once your thesis is published, we would welcome it to be added to the College research database! See https://www.midwife.org.nz/midwives/research/submitting-to-research-database/)

Ngā mihi | Warm regards

Annie Oliver

Journal Secretariat | Research Administrator editassist@nzcom.org.nz

Appendix A.2: Sage Publications

RightsLink

A process for assessing the reliability and validity of questions for use in online surveys: Exploring how communication technology is used between Lead Maternity Carer midwives and pregnant people in Aotearoa New Zealand

Author: Karen J Wakelin, Judith McAra-Couper, Tania Fleming, Gwen D Erlam

Publication: Methodological Innovations

Publisher: SAGE Publications

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Appendix A.3: Elsevier

Re: Permission sought for inclusion in PhD thesis [231106-009807]

Permissions Helpdesk <permissionshelpdesk@elsevier.com>
Thu 9/11/2023 2:09 AM
To: karen.wakelin@autuni.ac.nz <karen.wakelin@autuni.ac.nz>

Dear Karen Wakelin,

Thank you so much for contacting us.

Please note that, as one of the authors of this article, you retain the right to reuse it in your thesis/dissertation. You do not require formal permission to do so. You are permitted to post this Elsevier article online if it is embedded within your thesis subject to proper acknowledgment.

Our preferred acknowledgement wording will be:

Example: “This article/chapter was published in Publication title, Vol number, Author(s), Title of article, Page Nos, Copyright Elsevier (or appropriate Society name) (Year).”

All the best for your thesis submission!

Kind regards,

Kaveri Thakuria

Senior Copyrights Coordinator

ELSEVIER | HCM - Health Content Management

Appendix A.4: The Practising Midwife

RE: The Practising Midwife Australia September 2023 - your article for approval - please read

Alessandra Bayes <a1essandra@all4maternity.co.uk>

To: Karen Wakelin

Cc: Karen Wakelin <kwakelinz5@gmail.com>

EXTERNAL EMAIL WARNING

Hi Karen,

Thank you for your emails with your amends.

I can confirm that your article is allowed to be included in your thesis. Please let me know if you need any further information.

Have a lovely weekend!

Kind regards, Alessandra

Alessandra Bayes

Business Management AdministrationAssistant

+44 (0) 1282 858204

+44 (0) 7813181 037

www.all4matemi!Y.com

SaturnHouse Mercury Rise. Al1ham Business Park:Altham, Lancashire 885 SBY. United Kingdom

all4malemdy ,s the trading name of All4HOLDINGS LIMITED Regislered ill England No.10597238

Appendix A.5: SAGE Publications

International Journal of Qualitative Methods Volume 23

Using an online platform for conducting face-to-face interviews

Article first published online: February 13, 2024. Issue published: January-December

2024 Keywords: online platform, co-presence, flexibility and convenience, video

Rights and permissions

Appendix B: Ethics Approval

Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology
D-88, Private Bag 92006, Auckland 1142, NZ T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz www.aut.ac.nz/researchethics

25 September 2020 Judith McAra-Couper

Faculty of Health and Environmental Sciences Dear Judith

Re Ethics Application: **20/279 Using a midwifery quality care framework to explore the use of technologically mediated communication between LMC midwives and antenatal women in Aotearoa New Zealand: A mixed method approach.**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 25 September 2023.

Standard Conditions of Approval

1. The research is to be undertaken in accordance with the Auckland University of Technology Code of Conduct for Research and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard and that all the dates on the documents are updated.
8. AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted and you need to meet all ethical, legal, public health, and locality obligations or requirements for the jurisdictions in which the research is being undertaken.

Please quote the application number and title on all future correspondence related to this project.

For any enquiries please contact ethics@aut.ac.nz. The forms mentioned above are available online through http://www.aut.ac.nz/research/researchethics

(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat
Auckland University of Technology Ethics Committee

Cc: Kwakelinz5@gmail.com; Tania Fleming

Appendix B.1: Amendment 1

Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology
D-88, Private Bag 92006, Auckland 1142, NZ T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz www.aut.ac.nz/researchethics

23 August 2022
Judith McAra-Couper
Faculty of Health and Environmental Sciences

Dear Judith

Re: Ethics Application: **20/279 Using a midwifery quality care framework to explore the use of technologically mediated communication between LMC midwives and antenatal women in Aotearoa New Zealand: A mixed method approach.**

Thank you for your request for approval of amendments to your ethics application.

The amendment to the data collection protocol (choice of focus group or interview) has been approved.

Standard Conditions of Approval.

1. The research is to be undertaken in accordance with the Auckland University of Technology Code of Conduct for Research and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard.
8. AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted. When the research is undertaken outside New Zealand, you need to meet all ethical, legal, and locality obligations or requirements for those jurisdictions.

Please quote the application number and title on all future correspondence related to this project.

For any enquiries please contact ethics@aut.ac.nz. The forms mentioned above are available online through http://www.aut.ac.nz/research/researchethics

(This is a computer-generated letter for which no signature is required) The AUTEC Secretariat Auckland
University of Technology Ethics Committee

Cc: Kwakelinz5@gmail.com; Tania Fleming

Appendix B.2: Amendment 2

Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology
D-88, Private Bag 92006, Auckland 1142, NZ T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz www.aut.ac.nz/researchethics

15 November 2022
Judith McAra-Couper
Faculty of Health and Environmental Sciences

Dear Judith

Re: Ethics Application: **20/279 Using a midwifery quality care framework to explore the use of technologically mediated communication between LMC midwives and antenatal women in Aotearoa New Zealand: A mixed method approach.**

Thank you for your responses to the conditions for the amendment to your ethics application. The amendment to the recruitment protocol (through LMC's and Facebook) has been approved.

Non-Standard Conditions of Approval

1. Please insert the AUT logo on the advertisement.

Non-standard conditions must be completed before commencing your study. Non-standard conditions do not need to be submitted to or reviewed by AUTEC before commencing your study.

Standard Conditions of Approval.

1. The research is to be undertaken in accordance with the Auckland University of Technology Code of Conduct for Research and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard.
8. AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted. When the research is undertaken outside New Zealand, you need to meet all ethical, legal, and locality obligations or requirements for those jurisdictions.

Please quote the application number and title on all future correspondence related to this project.

For any enquiries please contact ethics@aut.ac.nz. The forms mentioned above are available online through http://www.aut.ac.nz/research/researchethics

(This is a computer-generated letter for which no signature is required) The AUTEC Secretariat

Auckland University of Technology Ethics Committee

Cc: Kwakelinz5@gmail.com; Tania Fleming

Appendix C: Recruitment to Phase 1

Appendix C.1: LMC midwives

Research Title

Using a midwifery quality care framework to explore the use of communication technology between LMC midwives and pregnant women/people in Aotearoa New Zealand: A mixed method approach.

Introduction:

Kia ora, my name is Karen Wakelin, and I am undertaking research for a PhD at Auckland University of Technology.

The aim of my research is to explore how communication technology enable LMC midwives and pregnant women/people to connect and how this contributes towards quality maternal and newborn care.

This research will be conducted over three phases and will involve collecting survey data from pregnant women/people and LMC midwives, interviews with pregnant women/people and LMC midwives and finally interviews with maternity stakeholder organisations.

If you are a currently practicing LMC midwife and use a mobile phone with internet capabilities, then I would ask you to please consider participating in this survey by clicking on the link below. The survey is expected to take about 10-15 minutes of your time.

If you have any questions regarding the research, either now or in the future, please feel free to contact me: Karen Wakelin: karen.wakelin@autuni.ac.nz or 021 0445212 Or supervisors:
Primary supervisor: Dr Judith McAra-Couper:
Judith.mcara@aut.ac.nz Secondary supervisor: Dr Tania Fleming:
tania.fleming@aut.ac.nz

Approved by the Auckland University of Technology Ethics Committee on 25/09/2020, AUTEC Reference number 20/279

Appendix C.2: Pregnant women/people

Research Title

Using a midwifery quality care framework to explore the use of communication technology between LMC midwives and pregnant women/people in Aotearoa New Zealand: A mixed method approach.

Introduction:
Kia ora, my name is Karen Wakelin and I am undertaking research for a PhD at Auckland University of Technology.

The aim of my research is to explore how the use of communication technology enable LMC midwives and antenatal women to connect and how this contributes towards quality maternal and newborn care.

Given this research is taking place during the global Covid-19 pandemic, it is expected that use of communication technology will have had some influence in the way midwives and women communicate and connect with one another. This research will be conducted over three phases and will involve collecting survey data from antenatal women and LMC midwives, interviews with antenatal women and LMC midwives and finally interviews with maternity stakeholder organisations.

If you are at least 20 weeks pregnant, 18 years of age, have access to a mobile phone which has text/email/internet capabilities and receiving care from a Lead maternity carer midwife then I would ask you to please consider participating in this survey by clicking on this link. The survey is expected to take about 15-20 minutes of your time.

If you have any questions regarding the research, either now or in the future, please feel free to contact me: Karen Wakelin: kwakelinz5@gmail.com or 021 0445212
Or supervisors:
Primary supervisor: Dr Judith McAra-Couper: Judith.mcara@aut.ac.nz
Secondary supervisor: Dr Tania Fleming: tania.fleming@aut.ac.nz

Approved by the Auckland University of Technology Ethics Committee on 25/09/2020, AUTEC Reference number 20/279.

Appendix D: Participant information Form

Appendix D.1: Participant Information form: LMC midwives

Project Title:
Using a midwifery quality care framework to explore the use of communication technology between LMC midwives and pregnant women/people in Aotearoa New Zealand: A mixed method approach.

Kia ora, my name is Karen Wakelin, and I am undertaking research for a PhD at Auckland University of Technology.

Thank you for participating in this online survey. The purpose of the survey is to explore your experiences with using communication technology with antenatal women in your practice. The information you provide in this research will contribute towards understanding how technologically mediated communication enables women and midwives to connect with one another. It may identify aspects of communication technology which contribute towards quality maternal and newborn care or may identify areas where more support is needed.

Your participation in this survey is completely voluntary (it is your choice). In undertaking this survey, you are consenting to the information you provide being used to contribute towards understanding how communication technology enables antenatal women and LMC midwives to connect with one another. You can choose to answer all or some of the questions, or you can withdraw from the survey at any point. After the responses to the survey have been submitted, however, your data can neither be identified or withdrawn.

The survey is expected to take approximately 15-20 minutes of your time.

How will confidentiality / anonymity be protected?
Your responses to the survey will be anonymous, and there will be no identifying information recorded. After the survey is submitted, you will be asked if you wish to participate in a further interview and to provide contact details for the research to contact you. There will be no way to link information you provided in the survey to this final question.

What data or information will be collected and how will it be used?
Data from the survey will be analysed to find themes and triangulated with data from phase two and three of the research process. The research will be submitted in publication form as part of a PhD thesis, with papers published in peer reviewed journals and presented at conferences.

Data storage
All electronic survey data will be stored on a password protected computer and stored on a cloud-based facility which only the researcher and supervisors will have access to. All electronic data will be deleted after six years.

Will I receive feedback on the results of this research?

You will be able to receive feedback from this research through a URL link which will be made available through the online platform used to advertise this research.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor,
Dr Judith McAra-Couper: Judith.mcara@aut.ac.nz Cell: 021 836-743
Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC,
ethics@aut.ac.nz , (+649) 921 9999 ext 6038.

What if I have question?
If you have any questions regarding the research, either now or in the future, please feel free to contact the researcher: Karen Wakelin:
kwakelinz5@gmail.com or 021 0445212
or primary supervisor: Dr Judith McAra-Couper: judith.mcara@aut.ac.nz

Approved by the Auckland University of Technology Ethics Committee on *25/09/2020*, AUTEC Reference number *20/279*.

Appendix D.2: Participant Information Form: Pregnant women/people

Project Title:

Using a midwifery quality care framework to explore the use of communication technology between LMC midwives and pregnant women/people in Aotearoa New Zealand: A mixed method approach.

Kia ora, my name is Karen Wakelin, and I am undertaking research for a PhD at Auckland University of Technology.

Thank you for participating in this online survey. The purpose of the survey is to explore your experiences with using communication technology with your LMC midwife. The information you provide in this research will contribute towards understanding how technologically mediated communication enables women and midwives to connect with one another. It may identify aspects of communication technology which contribute towards quality maternal and newborn care or may identify areas where more support is needed.

Your participation in this survey is completely voluntary (it is your choice). In undertaking this survey, you are consenting to the information you provide being used to contribute towards understanding how communication technology enables antenatal women and LMC midwives to connect with one another. You can choose to answer all or some of the questions, or you can withdraw from the survey at any point. After the responses to the survey have been submitted, however, your data can neither be identified or withdrawn.

The survey is expected to take approximately 15-20 minutes of your time.

How will confidentiality / anonymity be protected?

Your responses to the survey will be anonymous, and there will be no identifying information recorded. After the survey is submitted, you will be asked if you wish to participate in a further interview and to provide contact details for the research to contact you. There will be no way to link the information you provided in the survey to this final question.

What data or information will be collected and how will it be used?

Data from the survey will be analysed to find themes and triangulated with data from surveys of LMC midwives, interviews with antenatal women and LMC midwives and interviews with maternity stakeholder organisations. The research will be submitted in publication form as part of a PhD thesis, with papers published in peer reviewed journals and presented at conferences.

Data storage

All electronic survey data will be stored on a password protected computer and stored on a cloud-based facility which only the researcher and supervisors will have access to. All electronic data will be deleted after six years.

Will I receive feedback on the results of this research?

You will be able to receive feedback from this research through a URL link which will be made available through the online platform used to advertise this research.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor,
Dr Judith McAra-Couper: Judith.mcara@aut.ac.nz Cell: 021 836-743
Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, *ethics@aut.ac.nz* , (+649) 921 9999 ext 6038.

What if I have question?
If you have any questions regarding the research, either now or in the future, please feel free to contact the researcher: Karen Wakelin: kwakelinz5@gmail.com or 021 0445212
or primary supervisor: Dr Judith McAra-Couper: Judith.mcara@aut.ac.nz

Approved by the Auckland University of Technology Ethics Committee on *25/09/2020*, AUTEC Reference number *20/279*.

Appendix E: Recruitment of pregnant women/people to Phase 2

Appendix E: Recruitment via Facebook advertising

Research Title:

Using a midwifery quality care framework to explore the use of communication technology between LMC midwives and pregnant women/people in Aotearoa New Zealand: A mixed method approach.

Introduction:
Kia ora, my name is Karen Wakelin, and I am undertaking research for a PhD at Auckland University of Technology. My research aims to explore how pregnant people and their LMC midwife use communication technology when communicating with each other.

If you are at least 20 weeks pregnant, 18 years of age, have access to a mobile device which has text/email/internet capabilities and receiving care from a Lead maternity carer midwife then I would ask you to please consider participating in an online interview. The interview is expected to take about 40 minutes of your time at a time that is convenient for you.

If you are interested in taking part, or have any questions regarding the research, please contact me:
Karen Wakelin: karen.wakelin@autuni.ac.nz or 021 0445212
Or supervisors:
Professor Judith McAra-Couper: Judith.mcara@aut.ac.nz
Dr Tania Fleming: tania.fleming@aut.ac.nz

Approved by the Auckland University of Technology Ethics Committee on 25/09/2020, AUTEC Reference number 20/279.

Appendix E.1: Recruitment of Pregnant women/people via third party

Friday 21st April, 2023

Tēna koutou,

I am a midwifery educator at OP/Te Pūkenga and am also undertaking my PhD through AUT.

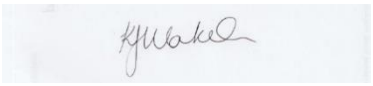
My research is exploring how LMC midwives and pregnant women/people use communication technology to connect with one another.

Following a meeting with my PhD supervisor (copied into this email), I am emailing as I really need your help.

I have completed interviews with midwives but unfortunately have had difficulties with recruiting pregnant women/people. I would greatly appreciate if you could please email your staff to see if they know of any pregnant women/people who would be interested in an online interview? The interview would be expected to take about 40 minutes. If so, I can then send more information regarding the study.

Thank you thank you and I hope to hear from you or your colleagues soon.

Ngā mihi nui



Karen Wakelin

(PhD Candidate, Auckland University of Technology, New Zealand)

Appendix F: Phase 2: Participant information form

Appendix F.1: LMC midwives

Participant Information Sheet for LMC Midwives

Date Information Sheet Produced:

1st September 2022

Project Title

Using a midwifery quality care framework to explore the use of communication technology between LMC midwives and pregnant women/people in Aotearoa New Zealand: A mixed method approach.

An Invitation

Thank you for completing the online survey and indicating your interest in taking part further in this research. I would like to invite you to take part in either a focus group or interview which will explore in greater detail the issues identified from the online survey.

What is the purpose of this phase of the research?

The aim of this phase of the research is to explore from LMC midwives' perspectives how communication technology has enabled effective communication and to identify what if any challenges there were when using communication technology to connect with pregnant women/people.

How was I identified and why am I being invited to participate in this research?

You completed an online survey and indicated you would be interested in taking part further in this research. Your participation in the second phase of this research will enable further exploration into findings from the online survey on how communication technology is used when communicating with pregnant women/people and how this contributes towards quality maternal and newborn care. This research has been approved by AUT's ethics committee, AUTEC. The findings of this research will be used for academic publications as part of my doctoral qualification and may involve conference presentations.

How do I agree to participate in this research?

If you agree to participate in the interview or focus group or wish to ask further questions, please contact the researcher, Karen Wakelin: karen.wakelin@autuni.ac.nz or 021 0445212. The focus group or interview will take place using an online platform and is expected to take about 40-60 minutes of your time.

Your participation in this research is voluntary (it is your choice) and whether or not you choose to participate will neither advantage nor disadvantage you. You are able to withdraw from the study at any time. Please note, that if you choose to take part in a focus group, and then withdraw from the study it may not be possible to destroy all records of the focus group discussion of which you took part. You will however be offered the choice between having any

data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of data may not be possible.

What will happen in this research?

The focus group /interview will be recorded and transcribed (using the transcription function on the online platform or by the researcher, if this function is not available). All identifying features will be removed before any discussion with supervisors. You will be offered a copy of the transcript to review if you wish. The data will be analysed to find themes and triangulated with data from phase one and three of the research process. Quotes may be taken from the focus group /interview and included in the thesis to illustrate particular themes. The research will be submitted in publication form as part of a Doctoral thesis, with papers published in peer reviewed journals and presented at conferences.

What are the discomforts and risks?

None are anticipated.

How will these discomforts and risks be alleviated?

AUT Health Counselling and Wellbeing is able to offer three free sessions of confidential counseling support for adult participants in an AUT research project. These sessions are only available for issues that have arisen directly as a result of participation in the research and are not for other general counselling needs. To access these services, you will need to:

- drop into our centres at WB219 or AS104 or phone 921 9992 City Campus or 921 9998 North Shore campus to make an appointment. Appointments for South Campus can be made by calling 921 9992
- let the receptionist know that you are a research participant and provide the title of my research and my name and contact details as given in this Information Sheet.

You can find out more information about AUT counsellors and counselling on http://www.aut.ac.nz/being-a- student/current-postgraduates/your-health-and-wellbeing/counselling.

What are the benefits?

The information you provide in this research will contribute towards understanding how communication technology used between LMC midwives and pregnant women/people contributes to quality maternal and newborn care. This will lead to the development of midwifery knowledge around relationships developed between midwives and pregnant women/people and may also have flow on effects to other areas of maternity care and other health disciplines. It is hoped that recommendations will be developed on how communication technology can be used effectively and thus contribute to quality care.

This research will also enable the researcher to gain a doctoral qualification in midwifery.

How will my privacy be protected?

You will be asked if you wish to take part in either a focus group or interview. If you choose to take part in the focus group, your identity will be known to other participants. Confidentiality will be maintained through offering you a pseudonym, (or you may use your own name if you wish) when writing up the findings from the focus group/interview. Recording from the interview or focus group will be stored on the University OneDrive cloud. The transcription

data from the Interview/focus group will be stored on the researcher's password protected computer. All data files and recordings will be destroyed or deleted after six years.

What are the costs of participating in this research?

There is a time commitment of approximately 40-60 minutes but no financial cost.

What opportunity do I have to consider this invitation?

The participant information sheet has been attached to the email address you provided when indicating you would be happy to take part in a further interview. Once you have read over the information, you are asked to please contact me within two weeks if you are still interested in taking part in either an interview or focus group. If I have not heard from you within two weeks, I will send you a reminder email. If I have not heard from you within another two weeks, I will assume you are unable to take part in this research. A final email thanking you for your involvement so far will then be sent.

Will I receive feedback on the results of this research?

Yes. You will be able to receive feedback from this research through a URL link which will be emailed to you highlighting publications resulting from this research. A summary of findings will also be offered to you at the completion of the study.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Professor Judith McAra-Couper, Judith.mcara@aut.ac.nz, 021836743

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC,

ethics@aut.ac.nz , (+649) 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Karen Wakelin: Email: karen.wakelin@autuni.ac.nz or Phone 021 0445212

Project Supervisor Contact Details:

Primary supervisor: Professor Judith McAra-Couper: Judith.mcara@aut.ac.nz

Approved by the Auckland University of Technology Ethics Committee on 25/09/2020, AUTEC Reference number 20/279.

Appendix F.2: Pregnant women/people

Participant Information Sheet for Pregnant women/people

Date Information Sheet Produced: 3rd July 2022

Project Title

Using a midwifery quality care framework to explore the use of communication technology between LMC midwives and pregnant women/people in Aotearoa New Zealand: A mixed method approach.

An Invitation

Kia ora, my name is Karen Wakelin, and I am undertaking research for a PhD at Auckland University of Technology. I would like to invite you to take part in an interview which seeks to explore your experiences with using communication technology with your LMC midwife.

What is the purpose of this research?

The purpose for the interview is to expand on findings from an online survey with pregnant women/ people and LMC midwives to explore how communication technology is used between pregnant women/people and LMC midwives and how this contributes towards quality maternal and new-born care.

How was I identified and why am I being invited to participate in this research?

You either participated in an online survey and indicated you were happy to take part in a further interview, or you have responded to an invitation to participate in an interview through your midwife, a Closed Pregnancy Facebook group or through advertising at pregnancy antenatal classes. This research has been approved by AUT's ethics committee, AUTEC. The findings of this research will be used for academic publications as part of my doctoral qualification and may involve conference presentations.

How do I agree to participate in this research?

If you agree to participate in the interview or wish to ask further questions, please contact the researcher, Karen Wakelin:karen.wakelin@autuni.ac.nz or 021 0445212. Due to the uncertainty around the Covid-19 pandemic, interviews will take place using an online platform. The interview is expected to take about 30-40 minutes of your time.

Your participation in this research is voluntary (it is your choice) and whether or not you choose to participate will neither advantage nor disadvantage you. You are able to withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

What will happen in this research?

The interview will be recorded and transcribed by the researcher with all identifying features removed before any discussion with supervisors. You will be offered a copy of your interview transcript to review if you wish. The data will be analysed to find themes and triangulated with data from the earlier online survey with pregnant women/people. Quotes may be taken from the interview and included in the thesis to illustrate particular themes. The research will be submitted in publication form as part of a Doctoral thesis, with papers published in peer reviewed journals and presented at conferences.

What are the discomforts and risks?

None are anticipated.

How will these discomforts and risks be alleviated?

AUT Health Counselling and Wellbeing is able to offer three free sessions of confidential counselling support for adult participants in an AUT research project. These sessions are only available for issues that have arisen directly as a result of participation in the research and are not for other general counselling needs. To access these services, you will need to:

- drop into our centres at WB219 or AS104 or phone 921 9992 City Campus or 921 9998 North Shore campus to make an appointment. Appointments for South Campus can be made by calling 921 9992
- let the receptionist know that you are a research participant, and provide the title of my research and my name and contact details as given in this Information Sheet

You can find out more information about AUT counsellors and counselling on http://www.aut.ac.nz/being-a- student/current-postgraduates/your-health-and-wellbeing/counselling.

What are the benefits?

The information you provide in this research will contribute towards understanding how communication technology used between LMC midwives and pregnant women/people contributes to quality maternal and newborn care. This will lead to the development of midwifery knowledge around midwife/woman relationships and may also have flow on effects to other areas of maternity care and other health disciplines. It is hoped that recommendations will be developed on how CT can be used effectively and thus contribute to quality care.

This research will also enable the researcher to gain a doctoral qualification in midwifery.

How will my privacy be protected?

If you choose to undertake an online interview, confidentiality will be maintained through offering you a pseudonym, (or you may use your own name if you wish). Recording from the interview will be stored on the University OneDrive cloud. The transcription data from the Interview will be stored on the researcher's password protected computer. All data files and recordings will be destroyed or deleted after six years.

What are the costs of participating in this research?

There is a time commitment of approximately 30-40 minutes but no financial cost.

What opportunity do I have to consider this invitation?

I will email you the participant information sheet for you to read over and will ask you to please contact me within two weeks if you are still interested in taking part in an interview. If I have not heard from you within two weeks, I will send you a reminder email. If I have not heard from you within another two weeks, I will assume you are unable to take part in this research. A final email thanking you for your involvement so far will them be sent.

Will I receive feedback on the results of this research?

Yes. You will be able to receive feedback from this research through a URL link which will be emailed to you highlighting publications resulting from this research. A summary of findings will also be offered to you at the completion of the study.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr Judith McAra-Couper, Judith.mcara@aut.ac.nz, 021836743

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, *ethics@aut.ac.nz* , (+649) 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Karen Wakelin: Email: karen.wakelin@autuni.ac.nz or Phone 021 0445212

Project Supervisor Contact Details:

Primary supervisor: Dr Judith McAra-Couper: Judith.mcara@aut.ac.nz

Approved by the Auckland University of Technology Ethics Committee on 25/09/2020, AUTEC Reference number 20/279.

Appendix G: Phase 2: Consent form

Consent Form

For use when interviews are involved.

Project title: ***Using a midwifery quality care framework to explore the use of communication technology between LMC midwives and pregnant women/people in Aotearoa New Zealand: A mixed method approach.***

Project Supervisor: ***Professor Judith McAra-Couper***

Researcher: ***Karen Wakelin***

○ I have read and understood the information provided about this research project in the Information Sheet dated 1st September 2022.

○ I have had an opportunity to ask questions and to have them answered.

○ I understand that notes will be taken during the interviews and that they will also be recorded and transcribed.

○ I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.

○ I understand that if I withdraw from the study then I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.

○ I understand that I will be offered a pseudonym or the option to use my own name (please tick): Yes ○ No ○

○ I agree to take part in this research.

○ I wish to receive a summary of the research findings (please tick one): Yes○ No○

Participant's signature : .....

Participant's Name: .....

Participant's Contact Details (if appropriate):.....

.....

.....

Date:

Approved by the Auckland University of Technology Ethics Committee on 25/09/2020, AUTEC Reference number 20/279.

Note: The Participant should retain a copy of this form.

Appendix H

Appendix H.1

LITERATURE REVIEW

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

Karen Wakelin[A,B] PhD (Cand), MA, GradDipTertEd, BSc (Hons), RM • **Judith McAra-Couper**[C] PhD, BA, DipMid, RM, RGON • **Tania Fleming**[C] PhD, MHSc, BM, RM • **Gwen Erlam**[C] DHSc, MA, BSN, RN

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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 (Häkkilä & 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

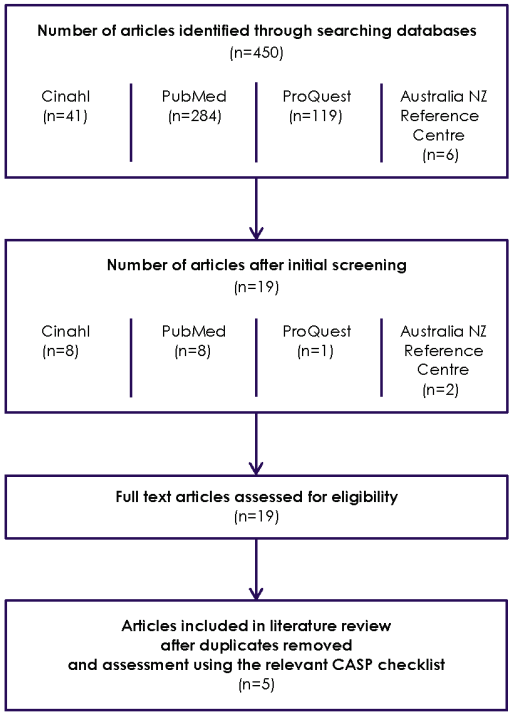
Excluded studies were those where the technology was used as an intervention to screen or diagnose a condition, rather than as a communication device, or where the communication included health professionals other than midwives.

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 relaying 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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Appendix H.2

Original Article

Methodological Innovations
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SAGE

A process for assessing the reliability and validity of questions for use in online surveys: Exploring how communication technology is used between Lead Maternity Carer midwives and pregnant people in Aotearoa New Zealand

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

Abstract

There is growing use of communication technology in Aotearoa New Zealand. How it is used between midwives and pregnant people is unknown. Surveys are ideal for gathering information when there is little known of a phenomenon. Aligning questions to a midwifery informed framework provides an innovate approach to explore this issue. To assess reliability and validity of questions for two online surveys using a tool created for an expert advisory group of midwives with experience in survey design and midwifery practice. An innovative approach is taken to validate questions for two online surveys using an expert advisory group of seven midwifery academic researchers with experience in both quantitative and qualitative research designs, and midwifery practice. The group were asked to rate items using a 4-point rating scale ranging from strongly agree to strongly disagree. Analysis of the scoring was undertaken using Content Validity Index, Cronbach's alpha coefficient and review of comments by the group. Quantitative scoring of both survey instruments were valid and reliable. The overall Content Validity Index score was 0.92 (midwives) and 0.93 (pregnant people). The overall Cronbach's alpha coefficient score was .78 (midwives) and .83 (pregnant people). Qualitative comments reinforced the validity and reliability of survey questions. An innovative approach was taken in assessing the reliability and validity of two online surveys using a midwifery expert advisory group and a midwifery framework to situate the surveys within a midwifery body of expertise and knowledge. The comments made by midwifery experts provided an extra layer in the validation of survey instruments using Content Validity Index and Cronbach's alpha coefficient scoring. Creating a tool for validating questions developed by midwives for an expert group of midwives recognises the potential patriarchal roots of knowledge production and dissemination and enables marginalised voices to be heard.

Keywords

Communication technology, Content Validity Index, Cronbach's alpha coefficient, development and validation tool, midwifery

Introduction

The continuity of care model of midwifery practice within Aotearoa New Zealand (NZ) is unique. It is based on partnership which involves the midwife (known as a Lead Maternity Carer), the childbearing person and their family working together sharing knowledge, decision making and trust to

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enable the best outcomes for mother and baby (Guilliland and Pairman, 1994). This model of care was legislated within Aotearoa New Zealand with the passing of the Nurses Amendment Act in 1990 which enabled midwives to practice in any setting whether it be home or hospital without medical supervision (Department of Health, 1990). Care is provided by the midwife from early pregnancy, during labour and birth through to 6 weeks postpartum following the birth of the baby (New Zealand College of Midwives, 2015) and is recognised internationally as providing one of the best systems of maternity care in the world (Ministry of Health, 2013). There were 58,659 live births registered in Aotearoa New Zealand in 2021 (Stats, 2022), with 93% of childbearing people receiving care from a Lead Maternity Carer midwife (LMC) (Ministry of Health|Manatū Hauora, 2022). Midwives as LMC's make up 38% of the midwifery workforce in Aotearoa NZ (Midwifery Council of New Zealand|Te Tatau o te Whare Kahu, 2022).

There is growing use of communication technology, in Aotearoa NZ. Ninety-one percent of adults aged between 18 and 34 years own a smart phone (Research New Zealand, 2015) and 89% were active internet users (Hughes, 2019). More often childbearing people are connecting with their midwife through using communication technology during their pregnancy. What is unknown however, is how this technology is being used between midwives and pregnant people to ensure quality maternal and newborn care within a continuity model of midwifery care.

Surveys offer an opportunity to gather information on attitudes, beliefs, opinions, behaviours, and characteristics of an area of interest and therefore are ideal to use when little is known of a phenomenon (Borbasi and Jackson, 2016; Safdar et al., 2016). There are many problems identified with instrument design such as questions which are poorly worded or vague, long, or with inappropriate response options (Sue and Ritter, 2007; Sullivan and Artino, 2017). Using an expert panel of reviewers with expertise in a particular topic area is one way to evaluate the reliability and validity of an instrument design (Davis, 1992; Lynn, 1986). Reliability refers to the consistency of survey responses over time, while validity refers to the extent to which the measurements of the survey provide the information needed to meet the study's purpose (Tavakol and Dennick, 2011). While using a tool for validating question design within midwifery are not new (Jenkinson et al., 2021; Milne et al., 2016) it's application within a midwifery continuity of care context, whilst aligning questions to an internationally recognised evidenced informed Quality Maternal and Newborn Care (QMNC) framework developed by leading global midwifery researchers (Renfrew et al., 2014) is less well known. The QMNC framework focuses on strengthening people's capabilities and ensuring care is tailored to meet their needs. It does this through identifying what is needed within a healthcare system to provide high quality care (Renfrew et al., 2014). Communication technology is widely used throughout Aotearoa (Hughes, 2019; Research New Zealand, 2015), and communication is an important aspect of the midwife/pregnant person relationship within a continuity model of midwifery care (Midwifery Council of New Zealand|Te Tatau o te Whare Kahu, n.d.). Identifying what aspects of communication technology are working well and how or what communication technology services need improving upon will be important to ensure services are meeting the needs of the pregnant person. Using an expert advisory group of midwives with expertise in survey design and midwifery knowledge adds to the building of scholarship within the midwifery research community. It does this by situating the survey designed by midwives for midwives and pregnant people within a midwifery body of expertise and knowledge. Content Validity Index and Cronbach's alpha coefficient provide a reliable way to critique the validity and reliability of the question design for use in online surveys with LMC midwives and pregnant people in Aotearoa New Zealand. This is validated further by qualitative comments provided by the EAG, to give robustness and certainty to the two survey instruments. The purpose of this paper is to discuss an innovative approach for assessing the reliability and validity of questions for use in online surveys and the contribution this makes to instrument validation within a midwifery context. It does this through asking midwifery experts, to use a tool alongside their review of questions for two online surveys.

Aim

To assess reliability and validity of questions designed for use in two online surveys to explore how communication technology is used between LMC midwives and pregnant people in Aotearoa New Zealand. The validation of questions was undertaken using a tool created specifically for use by a panel of midwifery experts with experience in survey design and midwifery practice. Analysis of the tool using Content Validity Index (CVI), Cronbach's alpha coefficient (CAC) and comments by the expert midwifery group are used to ensure the survey instruments are both valid and reliable.

Method

Innovative method for validating surveys

An innovative approach taken to validating the two online surveys is demonstrated by adding qualitative rigour to what would otherwise be considered a quantitative approach. In so doing, '*recognises the patriarchal and colonial roots of knowledge production and dissemination*' (Newnham and Rothman, 2022: 178) which is otherwise associated with quantitative survey designs. This is achieved through using an expert advisory group of midwives with experience in survey design and midwifery practice to rate questions used in a survey, along with providing comments to support their

scoring. This gives voice to the expertise of midwifery knowledge and builds a community of scholarship within the midwifery domain, to inform midwifery research. The questions for the survey have been specifically designed by midwives, for midwives and pregnant people in Aotearoa NZ within the context of an internationally respected model of midwifery care. These questions were then validated by midwives using a tool to provide a level of expertise and rigour that would otherwise not be possible to achieve. Questions designed for midwives and pregnant people are aligned with a midwifery evidenced informed quality maternal and newborn care framework which was developed by midwifery researchers, and is the first such midwifery framework to be published in the Lancet journal (Renfrew et al., 2014). The development and validation of the survey questions are outlined below.

Development and validation of the survey questions

The development and validation of the two online surveys was carried out using a two-stage process. (1) Questions were developed from findings of an integrative literature review, mapped with the Quality Maternal and Newborn Care (QMNC) framework (Renfrew et al., 2014) and (2) a tool was developed for use with validating questions by an expert advisory group (EAG) of midwifery academics and analysed using Content Validity Index (CVI), Cronbach's alpha coefficient (CAC) and review of comments made by the EAG. Content validity is the extent to which a study establishes a trustworthy cause and effect relationship between a treatment and an outcome (Pallant, 2016). It asks the question, 'Does it accurately measure what you want it to?' Cronbach's alpha tests the reliability of the instrument asking the question, 'Does it return the same or similar results each time it is used?' The higher the Cronbach's alpha, the greater the internal consistency (reliability) of the instrument (Pallant, 2016). A Cronbach's alpha of greater than 0.8 is preferable.

Stage 1: Development of survey questions

In stage 1, development of questions for the two online surveys were informed from findings of an integrative literature review conducted in preparation for the study (Wakelin et al., 2022) and then mapped with the QMNC framework (Table 1). The QMNC framework was selected specifically as it was developed by midwifery researchers for use within a maternity setting and offers an opportunity to explore how LMC midwives and pregnant people are using communication technology when communicating with one another within a continuity model of midwifery care. Questions were designed to sit within each of the four categories of the QMNC framework; organisation of care; values; philosophy and care providers.

Organisation of care. The themes from the integrative literature review were mapped across the 'organisation of care' category related to 'connecting' and 'access to health care'. Questions around location of care and access to care were addressed.

Values. Questions were designed to focus on how communication technology had been tailored to meet the pregnant person's needs, and how satisfied midwives and pregnant people were with the way they each responded to one another using the various communication technology platforms.

Philosophy. To highlight the importance of communication and connection, the questions sought to investigate how communication technology is used to promote health and wellness for pregnant people. Relevant themes from the integrative review include connecting, privacy and confidentiality.

Care providers. The category 'care providers' is concerned with how practitioners combine clinical knowledge and skills with interpersonal and cultural competence. Questions were designed to explore measures that midwives and pregnant people would take to ensure they had the necessary skills and knowledge when using communication technology. The findings from the integrative literature review identified both midwives and pregnant women lacked skills when using communication technology and had concerns around privacy and confidentiality.

Stage 2: Validation of questions for use in the two online surveys:

A tool for validating questions is recommended to assess whether the development of survey instruments are both valid and reliable (Tavakol and Dennick, 2011). Content validity refers to how well an instrument measures the construct under study (Zamanzadeh et al., 2014). The validity of the instruments is discussed using the Content Validity Index (CVI). Polit et al. (2007) discuss the use of a CVI for individual items as well as the content validity of an overall scale. Experts are asked to rate each item using a rating scale to enable reviewers to assess each item separately (Davis, 1992). This is achieved through scoring obtained from each item within an instrument and can be used to evaluate the clarity of the question used in a survey instrument (Polit and Beck, 2006).

Reliability of a survey instrument refers to the consistency of measurement and whether the items of the scale are all measuring the same underlying construct (Pallant, 2016). Reliability of the two survey instruments is discussed using Cronbach's alpha coefficient (CAC). Cronbach's alpha coefficient is commonly reported on 'as an indicator of instrument or scale reliability or internal consistency' (Taber, 2018: 1284) and provides 'a measure of the internal

Table 1. Mapping of questions to the categories on the QMNC framework.

		Themes from integrative literature review	Rationale for question
Practice Categories	Elements of communication technology that are important to women	• Access to health care	
Organisation of care	*Organisation of care within the QMNC framework focuses on the availability and access of acceptable good quality services and adequate resources.* For midwives, question design related to location of midwifery practice, how midwives provide care; whether this is continuity or shared care arrangements and where antenatal assessments usually take place. For pregnant people: questions asked about usual place of residence, access to communication technology, for example, internet, mobile phone	• Connecting • Access to health care	LMC midwives provide care to women in both urban and rural settings throughout New Zealand, with some providing continuity of care while others are working in shared care arrangements with other midwives or health professionals. Access to internet or Wi-Fi services may be problematic and may impact on how midwives and women connect and communicate with one another.
Values	*Values within the framework focus on how care has been tailored to meet women's circumstances and needs.* Question design related to how communication practices are tailored to meet the pregnant person's needs. The questions for midwives asked how they use communication technology to undertake assessments and whether they were able to connect with the pregnant person in a satisfactory way. Example Please indicate which communication technologies you ask pregnant people to use when contacting you for urgent or non-urgent communications or changing planned appointments? The questions for pregnant people asked how satisfied they were when their midwife uses different technology options to contact them. Where do antenatal appointments with your midwife usually take place?	• Connecting	Trust is an important value within relationships. How use of communication technology enables trusting relationships to be maintained between LMC midwives and pregnant people will be explored.
Philosophy	*The QMNC framework focused on how optimising biological, psychological, social and cultural processes strengthened women's capabilities.* Survey questions focus on whether the use of communication technology is negotiated and whether communication technology is used to promote health and wellness for pregnant women/people. Questions for pregnant people asked questions relating to face to face or online interactions. Which technologies pregnant people use to obtain information regarding their pregnancy.	• Connecting, • Privacy and confidentiality	The underlying philosophy of New Zealand midwifery is that midwifery care is undertaken in partnership and actively promotes and protects wellness and health awareness of the woman, her whanau and baby (New Zealand College of Midwives, 2015).
Care Providers	*This aspect of the QMNC Framework focused on practitioners who combined clinical knowledge and skills with interpersonal and cultural competence. The authors looked at the division of roles and responsibilities based on need, competencies and resources.* Questions focus on exploring the measures midwives (and pregnant people) take to ensure they have the skills and knowledge around using different communication platforms to connect with one another. Questions addressed the comfort level of LMC midwives and pregnant people with using technology. Example for both midwives and pregnant people: do you use any privacy protection software on your communication device(s)? Pregnant people: for example: Do you have any concerns about your privacy when using technology to connect with your midwife? For midwives: for example: How do you normally record or document face to face assessments and care planning with pregnant people? How do you normally record or document other non-face-to-face communication episodes with pregnant people?	• Skills and knowledge • Privacy and confidentiality	The Midwifery Council of New Zealand sets down competencies for practice which all midwives in Aotearoa New Zealand must adhere to. There are other regulatory bodies such as the Health and Disability Commission which outline the consumers code of rights when receiving/accessing health care.

Table 2. Tool used by expert advisory group for validating survey questions.

Item	Strongly Agree	Agree	Disagree	Strongly disagree	Comment
Appropriateness of the question for the category it is classified in.					
Relevance of question for assessing use of communication technology					
Question stated clearly					

consistency of a scale and is expressed as a number between 0 and 1' (Tavakol and Dennick, 2011: 53).

Once the questions for the survey were developed, the tool for validating questions was created and emailed to an expert advisory group (EAG) consisting of seven midwifery academic research colleagues with experience in both quantitative and qualitative research designs, and midwifery practise. An EAG consisting of between 3 and 10 reviewers is considered reasonable when reviewing a survey instrument (Lynn, 1986). Davis (1992) suggest using experts with experience in instrument construction techniques or with experience in a particular topic area as this 'maximises the likelihood of having an instrument that is both well-constructed and content-valid' (p. 194).

When deciding on what questions to retain in a survey, there seems to be some agreement to retain questions if reviewers reach agreement on questions rated as quite relevant or highly relevant (Davis, 1992; Lynn, 1986). For this tool, strongly agree – agree was used as an indication for retaining questions (De Castellarnau, 2018). A 4-point rating scale ranging from strongly agree to strongly disagree was used by the EAG to evaluate the level of agreement or disagreement with each of the survey questions. For the two instruments, reviewers from the EAG were provided with a tool for validating questions and asked to score each question based on three categories or items: (1) appropriateness of question, (2) relevance of question and (3) question stated clearly (Table 2). In determining whether the question was appropriate, relevant or stated clearly, scoring is based on whether reviewers 'agree' or 'strongly agree' with each item.

There are two ways of calculating the CVI score – one method which relies on universal agreement for each item between reviewers and the second, relying on an average item score (Polit and Beck, 2006). For the purposes of this tool an average item score was used alongside review of comments from the EAG. Addressing the validity of the question was undertaken in three ways. (1) An individual item score (i-CVI) was calculated by counting the number of reviewers who agreed/strongly agreed with each individual item and then divide the score by the number of reviewers, (2) a question score (q-CVI) was calculated by adding up the three individual item CVI scores for each question and dividing by three (this then gives an overall score for the validity of the question) and (3) an overall scale score (s-CVI) was calculated by adding up each of the overall q-CVI scores and dividing by the number of questions. This gave an overall instrument score. Polit and Beck (2006) comment that different approaches can lead to different values and therefore not always easy to calculate. To continue with the innovation of the method, a column for comments was added to the tool which would enable the EAG to provide feedback or comments on the wording of the question (Table 2). DeVellis (2017) recommend experts review the survey to rate the relevance of each question, to evaluate the clarity and conciseness of the questions and to provide further comments on other options that may have been missed. Using midwifery expert knowledge in this way, contributes to the validation of the survey instruments by giving a voice to midwives, and ensures questions are relevant and appropriate.

An individual item (i-CVI) score of 0.78 and above with six or more reviewers is considered acceptable (Davis, 1992; Lynn, 1986) while an overall scale (s-CVI) score of $\geqslant 0.9$ is considered acceptable (Polit and Beck, 2006). For this reason, any questions scoring below 0.78 for the i-CVI or 0.9 for the q-CVI and s-CVI have been highlighted in Tables 3 and 4.

The responses from the EAG were initially recorded into Excel and then transposed into SPSS version 27, for analysis. The initial plan to assess reliability was to use Cronbach's coefficient alpha (CAC) which would provide an indication of the average correlation among the items scale (Pallant, 2016). When CAC was applied to the survey for LMC midwives and pregnant people respectfully, the scoring was more difficult to interpret possibly due to only having three items per question. Pallant (2016) suggests less than 10 items in a scale can result in low scoring. In view of this, using CVI in conjunction with CAC and comments from the EAG would provide a better overall analysis of results.

Results

The EAG were asked to review 22 questions from the survey developed for LMC midwives (Table 3) and 13 questions for the survey developed for pregnant people (Table 4). For each question, the EAG were asked to evaluate the question based on (1) the appropriateness of the category it was classified in, (2) the relevance of the question and (3) whether the question was stated clearly.

The survey developed for LMC midwives included 22 questions, with 3 items per question giving a total of 66

Table 3. LMC midwife validation survey on a 22 question/66 item rating scale by seven experts: Items rated as agree or strongly agree.

Adapted Categories from QMNC Framework	Themes from integrative literature review	Questions from MW survey matched to categories from framework	Item	Number of experts who agreed/strongly agreed ($n=7$)	Item CVI (i-CVI)	Overall CVI for question (q-CVI)	Cronbach's alpha
Organisation of care: The focus is on the availability and access of acceptable good quality services and adequate resources.	• Connecting • Access to health care	Please indicate whether your main area of practice is: urban, rural, semi-rural, remote rural	Appropriateness of question	7	1.00	0.95	0.5 (negative covariance)
			Relevance of question	6	0.85		
			Question stated clearly	7	1.00		
		Please indicate whether you provide: continuity of midwifery care (antenatal, labour and birth and postnatal care), shared care arrangement with other midwives, GP or obstetrician. If you provide shared care, please indicate whether you provide: antenatal care only, labour and birth care only, postnatal care only, antenatal and postnatal care	Appropriateness of question	7	1.00	0.90	.75
			Relevance of question	6	0.85		
			Question stated clearly	6	0.85		
		Where do assessments with antenatal clients usually take place?	Appropriateness of question	7	1.00	0.90	.83
			Relevance of question	6	0.85		
			Question stated clearly	6	0.85		
		In your area of practice, how would you describe your access to the following: internet, connection, cell phone signal, landline connection Excellent Good Poor Do not have access	Appropriateness of question	7	1.00	0.95	.89
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		How difficult is it to communicate with antenatal clients where Wi-Fi access is problematic? (Please rate on a scale from 1 to 5 where 1 is not difficult and 5 is very difficult).	Appropriateness of question	6	0.85	0.85	.67
			Relevance of question	7	1.00		
			Question stated clearly	5	0.71		
Care providers: Questions focus on identifying the measures midwives took to ensure they had the skills and knowledge for using the various communication platforms.	• Skills and knowledge • Privacy and confidentiality • Access to health care	How would you rate yourself when using the following communication technology? Novice Intermediate Expert	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		If you needed to upskill yourself, how would you go about doing this?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		When receiving a text message from antenatal women/ people, how would you rate your level of concern with regard to: Sending and receiving text messages Privacy and confidentiality of text messages Interpreting text messages	Appropriateness of question	7	1.00	0.90	0
			Relevance of question	7	1.00		
			Question stated clearly	5	0.71		
		How do you normally record or document face to face assessments and care planning with antenatal clients?	Appropriateness of question	7	1.00	0.95	.83
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		How do you normally record or document other communication episodes with antenatal clients?	Appropriateness of question	7	1.00	0.95	.83
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		

(Continued)

Table 3. (Continued)

Adapted Categories from QMNC Framework	Themes from integrative literature review	Questions from MW survey matched to categories from framework	Item	Number of experts who agreed/strongly agreed ($n = 7$)	Item CVI (i-CVI)	Overall CVI for question (q-CVI)	Cronbach's alpha
Values: Values within the framework focus on how communication practices have been tailored to meet the pregnant person's needs.	• Connecting • Access to health care	Please indicate how frequently (within the last 2 weeks) you used the following technology when contacting antenatal clients in your practice (please tick all that apply)	Appropriateness of question	7	1.00	0.90	0
			Relevance of question	6	0.85		
			Question stated clearly	6	0.85		
		From your responses to the question above, please indicate how satisfied you were with using communication technology when communicating with pregnant women/people.	Appropriateness of question	7	1.00	0.90	0
			Relevance of question	7	1.00		
			Question stated clearly	5	0.71		
		What are the main forms of communication technologies that pregnant women/people use when contacting you?	Appropriateness of question	7	1.00	1.00	0
			Relevance of question	7	1.00		
			Question stated clearly	7	1.00		
		Have antenatal women/people ever sent you pregnancy related photos during their pregnancy?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		Have antenatal women/people ever sent you pregnancy related video clips during their pregnancy?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		Have you undertaken assessments with antenatal clients using video technology?	Appropriateness of question	7	1.00	1.00	0
			Relevance of question	7	1.00		
			Question stated clearly	7	1.00		
Philosophy: Questions focus on how the use of communication technology is negotiated and used to promote health and wellness for pregnant women/people	• Connecting • Privacy and confidentiality	Please indicate which communication technologies you ask women to use when contacting you for urgent or non-urgent communications or changing appointments:	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		Do you consider communication technologies have positively influenced the way you communicate with antenatal women/people?	Appropriateness of question	7	1.00	1.00	0
			Relevance of question	7	1.00		
			Question stated clearly	7	1.00		
		Were you affected by the Covid-19 alert level 3 lockdown?	Appropriateness of question	6	0.85	0.76	.83
			Relevance of question	6	0.85		
			Question stated clearly	4	0.57		
		When connecting face to face with antenatal clients, was there a preference for: Face to face in person or face to face via video link?	Appropriateness of question	6	0.85	0.80	.86
			Relevance of question	6	0.85		
			Question stated clearly	5	0.71		
		Has the way you communicate with antenatal clients changed as a result of Covid-19?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		How concerned are you that use of communication technology will lead to complaints?	Appropriateness of question	5	0.71	0.76	.84
			Relevance of question	6	0.85		
			Question stated clearly	5	0.71		
		Overall question/item rating score for 66 items				(s-CVI) 0.92	.78

Table 4. Pregnant people validation survey on a 13 question/39 item rating scale by seven experts: Items rated as agree or strongly agree.

Adapted categories from QMNC framework	Themes from integrative review	Questions from pregnant women/people survey matched to categories from framework	Item	Number of experts who agreed/strongly agreed ($n=7$)	Item CVI (i-CVI)	Overall question CVI (q-CVI)	Cronbach's alpha
Organisation of care: Focuses on the availability and access of acceptable good quality services and adequate resources.	• Access to health care • Connecting • Skills and knowledge	How would you describe your access to the following: Internet connection, cell phone signal, landline connection? Excellent Good Poor Do not have access	Appropriateness of question	7	1.00	0.90	.75
			Relevance of question	6	0.85		
			Question stated clearly	6	0.85		
		How comfortable are you with using the following communication technologies?	Appropriateness of question	7	1.00	0.90	0
			Relevance of question	7	0.85		
			Question stated clearly	6	0.85		
		How challenging was it to use communication technology when connecting with your midwife during Covid-19?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
Practice categories: Questions focus on the aspects of communication technology that are important to pregnant women/people	Access to health care	How frequently do you use the technology below when contacting your midwife?	Appropriateness of question	7	1.00	1.00	0
			Relevance of question	7	1.00		
			Question stated clearly	7	1.00		
		Were you affected by the Covid-19 alert level 3 lockdown?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		Has the way you communicate with your midwife changed as a result of Covid-19?	Appropriateness of question	7	1.00	0.95	−.316
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
Values: Values within the framework focus on how communication practices have been tailored to meet the pregnant person's needs.	• Connecting • Access to health care • Privacy and confidentiality	How frequently does your midwife use communication technology when contacting you?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		How satisfied are you with the way your midwife contacts you using communication technology?	Appropriateness of question	7	1.00	1.00	0
			Relevance of question	7	1.00		
			Question stated clearly	7	1.00		
		Have you sent pregnancy related photos to your midwife during your pregnancy?	Appropriateness of question	6	0.85	0.85	.76
			Relevance of question	7	1.00		
			Question stated clearly	5	0.71		
		Have you sent pregnancy related video clips to your midwife during your pregnancy?	Appropriateness of question	6	0.85	0.85	0
			Relevance of question	7	1.00		
			Question stated clearly	5	0.71		
Philosophy: *Questions focus on how the use of communication technology is negotiated and used to promote health and wellness for pregnant women/people.*	• Connecting Skills and knowledge	Do you believe the communication technologies you have used with your midwife have had a positive effect on your relationship with your midwife?	Appropriateness of question	7	1.00	0.95	0
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		Please indicate where you have sourced information from regarding your pregnancy (please tick all that apply).	Appropriateness of question	7	1.00	0.95	.894
			Relevance of question	7	1.00		
			Question stated clearly	6	0.85		
		From the list provided, please indicate on a scale from 1 to 5 how helpful were your sources of information? (With 1 being not helpful to 5 being extremely helpful).	Appropriateness of question	7	1.00	1.00	0
			Relevance of question	7	1.00		
			Question stated clearly	6	1.00		
		Overall question/item rating score for 39 items				(s-CVI) 0.938	.832

items. Seven items (i-CVI) from a total of 66 scored under the acceptable score of 0.78. The overall question (q-CVI) score for each question reached the acceptable level of ⩾0.9 for all but three questions where the range in scores were 0.76–0.85. The overall scale (s-CVI) score for all 66 items was 0.92. When Cronbach's alpha coefficient was applied to the whole survey (66 items), an overall score of 0.78 was achieved.

The survey developed for pregnant people included 13 questions, with three items per question giving a total of 39 items. An item (i-CVI) score was given for each item, along with an overall question (q-CVI) score for each question. Only two items from a total of 39 items scored under the accepted score of 0.78. The overall q-CVI score for each of the questions reached the acceptable level of ⩾0.9 except for two questions, where a score of 0.85 was achieved. The overall scale (s-CVI) score for all 39 items was 0.938. When CAC was applied to the whole survey (39 items), an overall score of 0.83 was achieved. While Pallant (2016) suggests a score of 0.7 or above will provide reliability and validation for a question, due to the small number of items per question being measured, the accuracy is less clear.

Where scoring on CVI and CAC did not reach acceptable levels, comments and suggestions on wording made by the EAG enabled the question to be either reworded or removed altogether. For example, a question asked of pregnant people:

> Have you sent pregnancy related photos to your midwife during your pregnancy?

This required a yes or no response. If 'yes' was indicated, a following question would ask '*how did your midwife respond*', with options provided such as 'via text, phone call or not at all'. Following feedback from the EAG, it was decided to include a text box within the survey as this would enable participants to provide information if they had sent more than one pregnancy related photo.

Similarly, an initial question in the survey for midwives would require a yes or no response:

> Do you use any privacy protection software on your communication devices?

Following feedback and suggestions from the EAG, if 'yes' was indicated, participants would have an option to indicate in a text box any privacy protection measures that they used.

Discussion

Using a tool to validate questions for use in two online surveys by an expert advisory group of midwives was a first step in a larger mixed methods multiphase study which seeks to explore how communication technology is used between LMC midwives and pregnant people in Aotearoa New Zealand.

Polit and Beck (2006) discuss two concepts behind the development and validation of instruments; (1) the developer has conceptualised and analysed the items to be used in the instrument and (2) the evaluation of the relevance of the instrument using an expert panel. The conceptualisation of the two survey instruments were informed by findings from an integrative literature review undertaken as part of the multi-phase study (Wakelin et al., 2022) and then mapped against the midwifery evidence-informed Quality Maternal and Newborn Care framework (Renfrew et al., 2014). The evaluation of the two instruments were analysed using Content Validity Index (CVI) and Cronbach's alpha coefficient (CAC) scoring, alongside comments from the EAG. Using content validity index scoring to rate individual item scores (i-CVI) and overall question scores (q-CVI) provided an opportunity to review and revise the few questions which did not achieve the acceptable validity score. These questions required minor tweaking or removal and were considered alongside comments and suggestions from the EAG. The overall scale CVI score (s-CVI) for both instruments achieved the acceptable level of ⩾0.9 (Polit and Beck, 2006) giving confidence that overall the instrument design was valid.

Interpreting results using CAC was challenging given, there were several items where the overall reliability score was 0. Difficulty in interpreting results using CAC has been reported when small numbers of items are used (Pallant, 2016; Taber, 2018). Each question had only three items which may explain the inaccuracies when analysing results using CAC. Taber (2018) suggests for this reason it is sometimes used alongside other tools as was done in this case, with using CVI. Calculating the CVI score was straightforward, doesn't require statistical knowledge, and therefore adds to the ease of interpreting results. Used alongside comments from the EAG of midwives, provided an additional layer in which to consider each question, and therefore added to the validity and reliability of the two survey instruments.

A challenge in the development of questions was around whether to include questions on Covid-19. While the analysis of the survey questions based on scoring from CVI and CAC would suggest the two surveys were valid and reliable, consideration was also given to comments made by the EAG. For example, there were initially a series of questions related to Covid-19.

> For LMC midwives: Were you affected by the Covid-19 alert level 3 lockdown? and Has the way you communicate with antenatal clients changed as a result of Covid-19?

> For pregnant people: Were you affected by the Covid-19 alert level 3 lockdown? Has the way you communicated with your midwife changed as a result of Covid-19? How challenging was it to use communication technology when connecting with your midwife during Covid-19?

The comments and suggestions made by the EAG, were that these questions could lead to confusion given that at the time the survey instrument was constructed, New Zealand was not currently in a lockdown and therefore the questions may not be relevant.

Another question asked under the heading of Covid-19 was 'how concerned are you that use of communication technology will lead to complaints?' The i-CVI score was lower than 0.78 on both the appropriateness of the question and the clarity of the question. The q-CVI for the question also scored lower than 0.9. The EAG were able to make suggestions for either rewording or removing the question altogether. As a result of this feedback, the sub heading of Covid-19 was removed and instead the question was reworded to 'How concerned are you that using communication technology with pregnant people may lead to complaints to Midwifery Council?'

Taking into consideration comments from the EAG provided greater insight into the scoring and was an important step in the design of the two online survey questions. Polit et al. (2007) suggests qualitative feedback can be indicative of content capability and commitment to the project. We would argue it is more than this. Increasingly looking to expertise within professions who haven't traditionally been used to validate tools, establishes a scholarly body of knowledge for those professions. The development of this tool was innovative in its approach of seeking the midwifery voice to validate tools and thus begin a scholarly body of knowledge. In this instance, an EAG of New Zealand midwives were reviewing questions for two online surveys designed by New Zealand midwives for use within a New Zealand midwifery continuity model of care using a QMNC framework, developed by leading midwifery researchers. The validation of the tool using Content Validity Index and Cronbach's alpha coefficient scoring was further validated by comments from midwifery experts in survey question design and midwifery practice. This in effect, provided an extra layer in the validation of survey instruments. It also builds a community of scholarship within midwifery (Newnham and Rothman, 2022). A similar approach was taken by Milne et al. (2016) in using cultural Indigenous experts in the development and validation of questions for an online survey which sought to measure nursing and midwifery academics' awareness of cultural safety. This approach is equally applicable to other smaller allied health professions who seek to establish a scholarly body of knowledge within their respective professions. Newnham and Rothman (2022) argue that the quantification of midwifery research is limiting midwifery knowledge, and therefore research methods which seek to give voice, and hold space for qualitative expertise is for the betterment of the profession. The feedback from the EAG enabled validation of the survey questions and provided a level of reliability and certainty that the questions would elicit appropriate responses. As the overall scoring of the survey instruments were considered within an acceptable range for validity and reliability, revalidation of the survey instruments was not sought from the expert advisory group.

Limitations

Analysis of results using CAC were at times difficult to interpret due to small numbers of items within each question. It was not possible to seek feedback from pregnant people with the survey design, however the EAG were able to offer constructive feedback with their expert midwifery knowledge and experience of survey instrument design. A further limitation is acknowledged in not seeking further validation from the EAG once changes to wording of questions were undertaken. This information could have provided further validation and reliability of items which hadn't initially met the acceptable scoring range.

Conclusion

Creating a tool for validating questions developed by midwives for an expert group of midwives recognises and values the knowledge and expertise from this professional group, and gives voice to midwifery, which traditionally has been marginalised by more patriarchal research paradigms. The findings from the EAG were analysed using Content Validity Index and Cronbach's alpha coefficient scoring. This provided validation that the questions were appropriate, relevant and stated clearly. Further validation was provided by comments and feedback from the EAG of midwives which added an extra layer of confidence with tweaking the final rendition of the two online surveys. This provided the assurance needed to move to the data collection phase of the study to explore how communication technology is used between LMC midwives and pregnant people in Aotearoa New Zealand.

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Appendix H.3

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

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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.

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 enabled 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

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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).

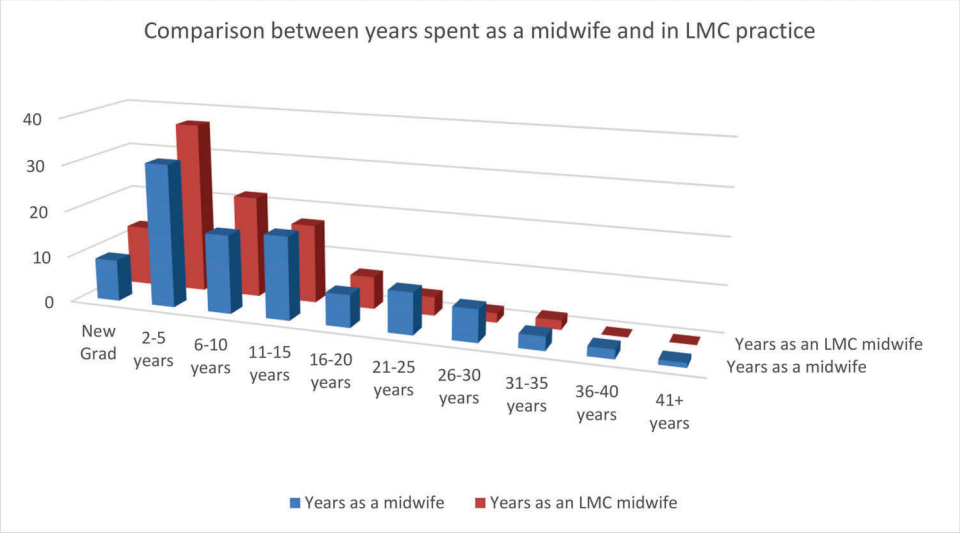

Fig. 1. Comparison between years spent as a midwife and years spent in LMC practice.

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

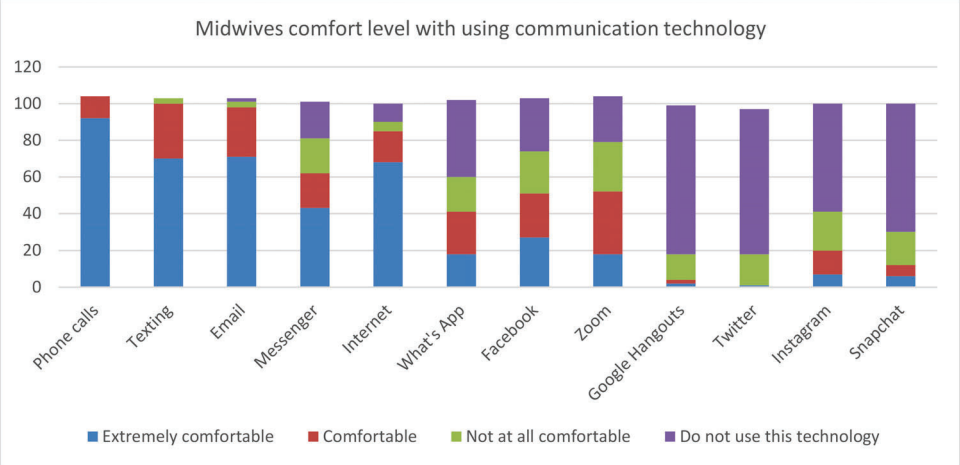

Fig. 2. Midwives comfort level with using communication technology.

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.

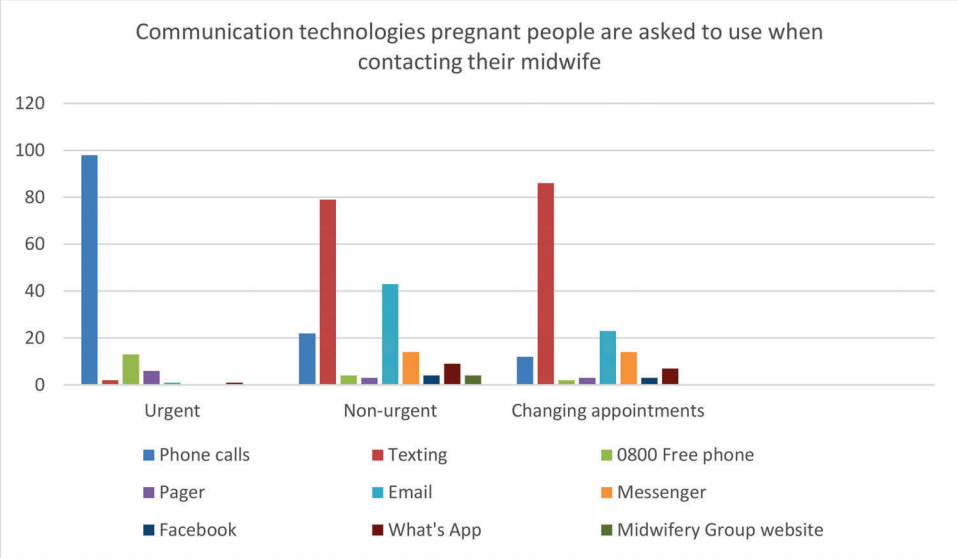

Fig. 3. Communication technologies pregnant people are asked to use when contacting their midwife.

(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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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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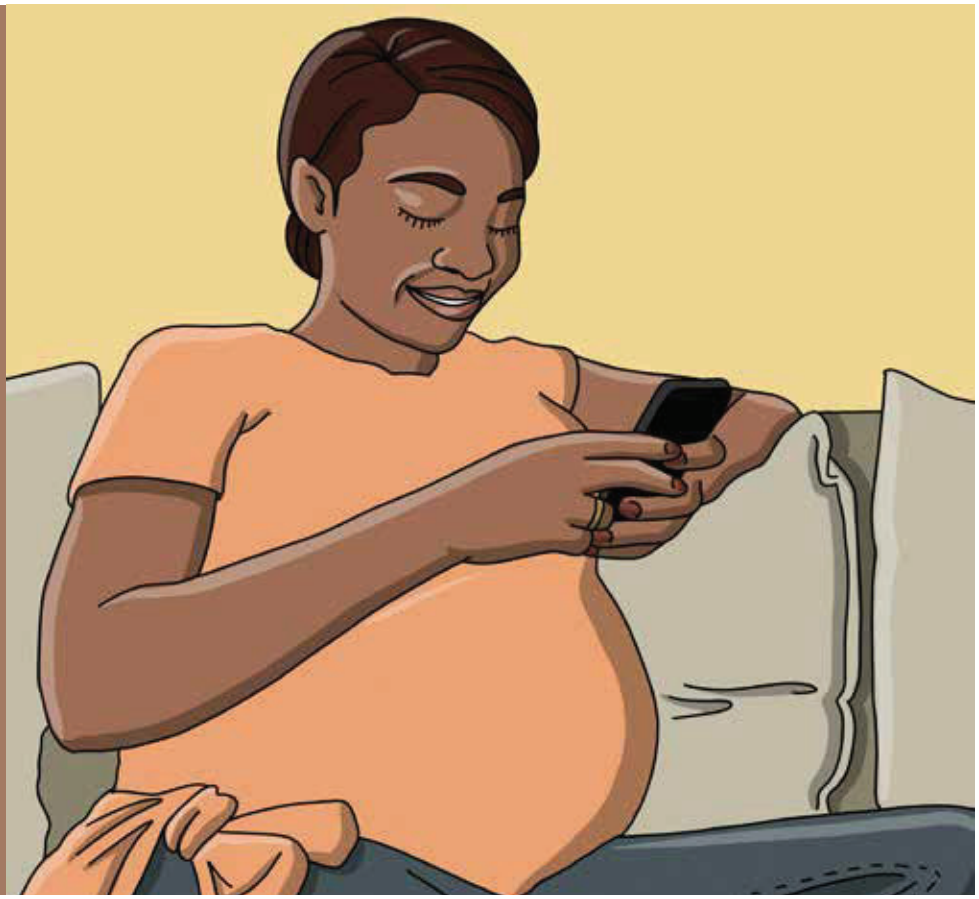
Appendix H.4

SURVEY RESULTS DESCRIBING HOW PREGNANT WOMEN/PEOPLE USE COMMUNICATION TECHNOLOGY WITH THEIR MIDWIFE IN AOTEAROA NEW ZEALAND

SUMMARY

Communication technology, particularly texting, has become a mainstream way to communicate between people. In Aotearoa New Zealand (NZ), 91% of adult users over 18 years old own a smart phone[1] which compares to smartphone use by people in Australia and the United Kingdom.[2,3] Within maternity care, communication technology has enabled childbearing people to access a midwife for support and reassurance, change appointments or request health information.[4,5,6]



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INTRODUCTION

An integrative literature review was undertaken of peer-reviewed studies between 2010 and 2021 to explore specifically how pregnant women/people and midwives used communication technology to connect with each another. Five studies met the criteria, with the overarching theme of connection identified.[7] This connection occurred regardless of the communication platform used, and whether the connection was synchronous (occurring at the same time) such as face-to-face via video technology or asynchronous (where there is a delay in communication) such as via text or forum post.[5,6,8]

Concerns were identified specifically in relation to asynchronous communication and the potential for misinterpretation or information taken out of context which could impact on the safety of care for pregnant people.[9]

Effective communication between pregnant women/people and midwives is essential to ensure quality maternal and newborn care, and was an important component identified in an evidence-informed Quality Maternal and Newborn Care (QMNC) framework.[10] Women/people felt strengthened and empowered when care was individualised and tailored to meet their needs.

In Aotearoa NZ, midwives work in partnership with the pregnant woman/person and their whanau (family) in a model of continuity of care from early pregnancy through to six weeks postpartum.[11] What is unknown is how pregnant women are using communication technology with their midwife in this model and how this contributes towards quality maternal and new-born care.

AIM

The aim of this survey was to describe the experiences of how pregnant women use communication technology when connecting with their midwife.

METHOD

This study reports the survey findings from phase 1B of a larger three-phase mixed-methods sequential transformative study, which incorporates both quantitative and qualitative methods using a theoretical framework.[12] Phase 1 involved collecting survey data from midwives (1A) and pregnant women (1B). The findings from the survey will inform questions for interviews in Phase 2 with midwives (2A) and pregnant people (2B). These findings from Phase 2A and 2B will then inform questions for interviews with maternity stakeholders in Phase 3. Questions for the survey were informed by using the QMNC framework[10] and findings from an integrative literature review undertaken prior to data collection.[7]

DEVELOPMENT OF THE SURVEY TOOL

The development of questions for the online survey was undertaken in two stages: (1) from themes identified through an integrative literature review specifically exploring how communication technologies are used between pregnant women/people and midwives; (2) assessing the validity and reliability of questions using an expert advisory group (EAG) of midwifery academics with experience in both quantitative and qualitative research designs.[13]

Four themes were identified from the review:

1. Connecting
2. Access to healthcare
3. Privacy and confidentiality
4. Lack of skills and knowledge

These 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
4. Philosophy

The questions were largely quantitative, however there were text boxes provided for participants to expand on their response to some questions. The online survey was created using an online Research Electronic Data Capture tool (REDCap).[14]

An example of questions used in the survey are shown in *table 1.*

Table 1: **Mapping of questions onto QMNC framework**

QMNC categories	Questions developed for online survey	Themes from integrative literature review
Practice Categories	Elements of communication technology that are important to women.	• Access to health care
Organisation of care Focuses on the availability and access of acceptable good quality services and adequate resources.	Pregnant women/people were asked about their usual place of residence, and access to communication technology e.g. internet, mobile phone. e.g. Please indicate whether your usual place of residence is: urban, rural, semi-rural, remote rural. Do you have access to the internet? Do you have a mobile phone which only you can use?	• Connecting • Access to health care
Values How care has been tailored to meet women's circumstances and needs.	Questions were developed to assess whether use of communication technologies is meeting the needs of pregnant women/people. e.g. How satisfied are you when your midwife uses the following technology to contact you? [A list of technologies is then provided]	• Connecting
Philosophy How optimising biological, psychological, social and cultural processes strengthened women's/people's capabilities.	Questions were developed to identify whether using communication technology helped to strengthen women's/people's capabilities and was seen as having a positive effect on their relationship with their midwife. e.g. What are the main communication technologies you use when contacting your midwife? What types of communication technologies have you used to inform yourself about your pregnancy? [A list of options was provided]	• Connecting • Privacy and confidentiality
Care Providers The focus is on practitioners who combined clinical knowledge and skills with interpersonal and cultural competence.	Adapted to include questions to identify comfort level with various types of communication technologies. e.g. How comfortable are you with using the following communication technologies? [A list of options was provided] Do you have any concerns about your privacy when using communication technology to connect with your midwife?	• Skills and knowledge • Privacy and confidentiality

RECRUITMENT

In recruiting participants, the first author identified herself as a midwife and was granted permission by the administration team to advertise the research on the closed pregnancy Facebook groups. Pregnant women/people who met the criteria were invited to participate in an online survey.

INCLUSION CRITERIA

- At least 20 weeks' gestation
- At least 18 years of age
- Have access to a mobile phone which has text/ email/internet capabilities
- Booked and receiving care with a midwife from at least 14 weeks gestation

DATA COLLECTION

In Phase 1B, online survey data was collected from pregnant women/people through advertising every two weeks on closed nationwide pregnancy Facebook groups in Aotearoa NZ from August 10 to October 13, 2021. Ethical approval for the study was granted by Auckland University of Technology Ethics Committee (AUTEC) on September 25, 2020 (ref: 20/279).

DATA ANALYSIS

Descriptive data was analysed using Statistical Package for Social Sciences (SPSS) version 27 for Windows. Descriptive statistics describe what is happening within a particular population when little is known of a phenomenon.[15] For questions, where qualitive responses were required, these were analysed using a basic form of thematic analysis.[16] Data was initially colour coded by the first author, organised under areas of similarity, and reviewed for commonalities to support the quantitative data. These were then discussed and agreed by the other authors.

RESULTS

Demographic Data

Forty-seven pregnant women/people responded to the online survey with an average age range between 26 to 30 years old, so slightly under the average age of 31 years reported by NZ.[17] Just over three quarters of the participants (76.6%) reported NZ European ethnicity, 10.6% Māori, 6.4% Asian, 4% Pacific Peoples and the remainder identified as Other. When compared with the last 2018 New Zealand Census, NZ European were slightly overrepresented, with Māori and Pacific Peoples underrepresented.[18]

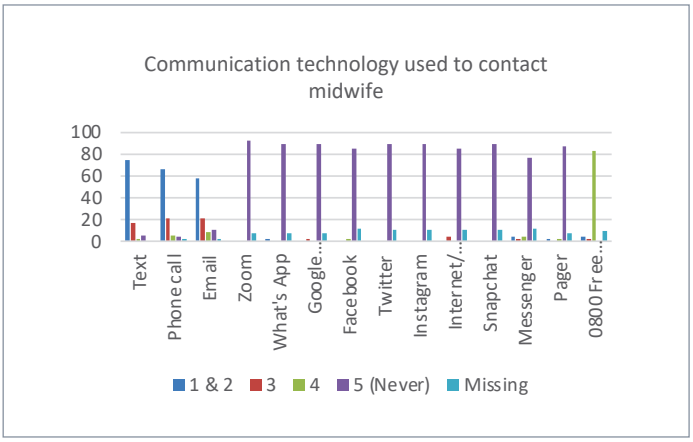
When comparing usual place of residence, almost 80% of participants lived in an urban area, with 8.5% indicating they live in a rural or semi-rural area and 2.1% live remote rural. These findings were similar to those reported by the survey undertaken with midwives in Phase 1A of the multi-phase study.

Access to their midwife using communication technology

All participants indicated they had access to a communication device at home, with all but one participant stating they had access to a mobile phone which only they used.

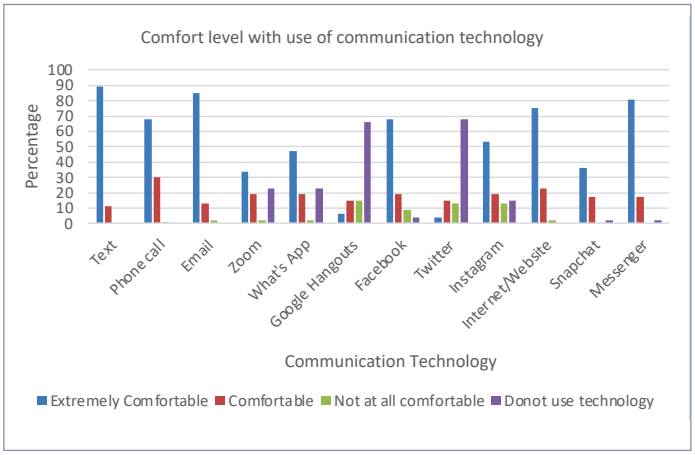
Participants were asked to rank from 1 to 5 with 1 being most used and 5 never used which communication technology they used to contact their midwife, (*figure 1*) and their comfort level with using the technology (*figure 2*).

***Figure 1:* Communication technology most used by pregnant women/people to contact their midwife**



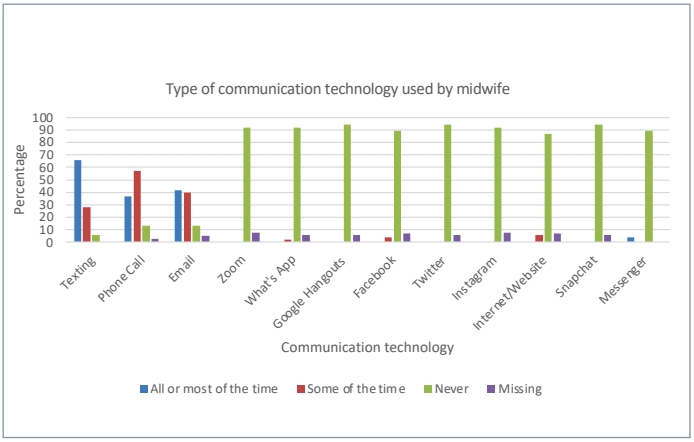
Texting was used by 75% of participants, followed by phone calls (66%) and emails (58%). When comparing comfort level (*figure 2*), 100% of participants indicated they were either extremely comfortable or comfortable with texting, and 98% with phone calls and email, suggesting that pregnant people are comfortable and happy to use this technology when connecting with their midwife.

***Figure 2:* Comfort with use of communication technology**



Pregnant women/people indicated that texting, phone calls and emails were often used by their midwife to contact them (*figure 3*). The results suggest that while there are a variety of communication technologies available, texting, phone calls and email are commonly negotiated for use between the pregnant person and their midwife.

Figure 3: **Type of communication technology used by midwife to contact pregnant women/people**

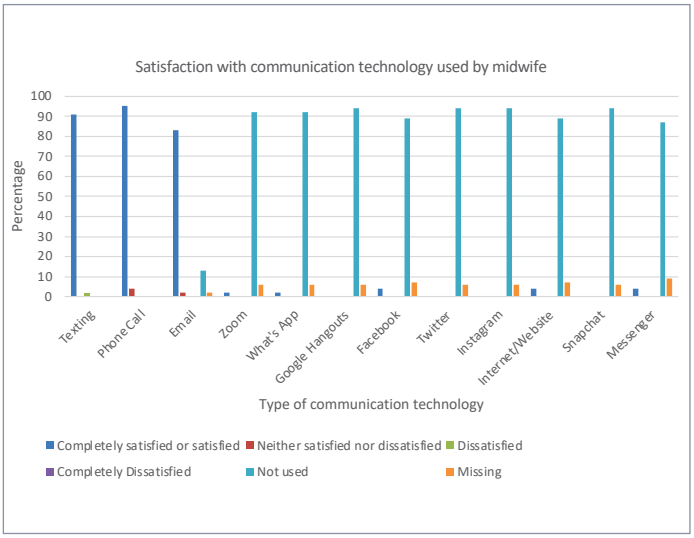


There were other forms of communication technology that participants felt comfortable using, for example, Facebook, Internet/website and Messenger. However, these technologies were not used by pregnant women/people or midwives when connecting with one another.

Influence of communication technology on the relationships between pregnant women/people and midwives

Pregnant women/people were asked whether they felt using communication technology had a positive effect on their relationship with their midwife – 81% of participants indicated they strongly agreed or agreed that CT had a positive effect on their relationship. When comparing how satisfied people were with the technology used by their midwife (*figure 4*) almost all participants (95%) were completely satisfied or satisfied with their midwife calling them, with 91% either completely satisfied or satisfied with their midwife texting. The technologies commonly associated with social media were indicated as not used by midwives or pregnant people when connecting with one another.

Figure 4: **Satisfaction with communication technology used by midwife**



> *"The results suggest that while there are a variety of communication technologies available, texting, phone calls and email are commonly negotiated for use between the pregnant person and their midwife."*

Privacy and confidentiality of information

Participants were asked whether they had any privacy concerns when connecting with their midwife, with 94% not having any concerns around privacy of information. However, when asked to leave a comment, in relation to sending photos or video clips, the response was mixed. Thirty-two participants (68%) provided a comment in response to this question. Of those who responded, 62% were either not concerned about privacy, or did not feel the need to send photos or videos.

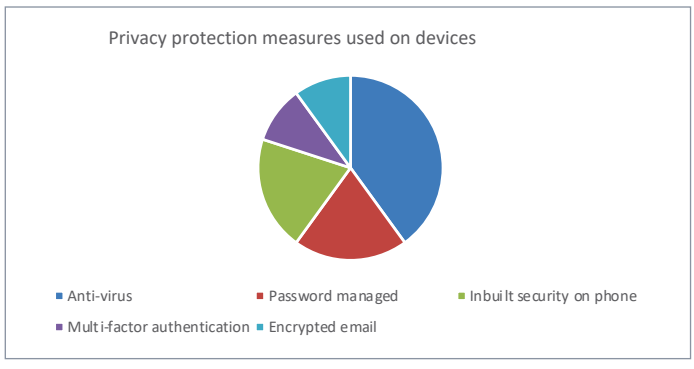
"I'm not worried about privacy; I just haven't had any need to send a photo or video yet" (QS 17: P:18)

However, for the remaining 38%, privacy was a concern with a preference for face-to-face or phone call contact with their midwife if they had concerns.

"Wouldn't send anything confidential that way, would wait to show at face-to-face visit" (Qs 17: P:32)

When participants were asked about privacy/security measures on their devices, the majority (79%) did not use any. Of those that did, antivirus software was the main protection used (*figure 5*).

Figure 5: **Privacy protection measures used on devices**



This general lack of concern around privacy when using technology seems to be out of sync with concerns raised by health professionals[19,20] and will be explored further in interviews in the next phase of the study.

Discussion

Texting was the most common form of communication technology used by pregnant women and midwives to connect with one another which has similarly been reported in other areas of maternity.[5,6] It is possible that pregnant people are aware of how busy their midwives are, and texting offers a way to connect in a non-intrusive manner. While pregnant women indicated they were satisfied with their midwife using phone calls, texting and email, it is difficult to draw conclusions on the impact this had on the relationship. It does suggest that technology, which is negotiated in an individualised manner, is tailored to meet the person's needs. Within a midwifery model of continuity of care, this contributes towards a relationship of trust. Trust, individualised care and empowerment have shown to be strengthened through a model of continuity of midwifery care[21] which contributes towards ensuring quality maternal and newborn care.[10]

The importance in negotiating how communication technology is used is highlighted by conflicting results in relation to privacy and confidentiality of information sent. While most participants indicate not having any concerns, and do not use any specific privacy protection software, over a third indicated they would not send photos, videos or confidential information. Participants preferred to speak face-to-face or have a phone conversation with their midwife. For some, communication technology provides distance to enable questions or concerns to be raised which might otherwise not be done face-to-face,[5,22] while for others there appears to be a tangible need to be seen or heard which cannot be achieved through virtual means. Communication which engages the senses has been identified within the literature as being important to assist clinicians with diagnoses and decisions around care.[23] So while in some instances images may be useful in helping practitioners make decisions,[19] midwives need to negotiate and individualise how this communication occurs based on what is important for the individual.

Limitation

The small number of participants in this study and missing data with some questions is a limitation. Advertising on Facebook may not reach the targeted childbearing population, particularly those aged between 18 and 25, and along with the frequency of postings on Facebook groups may mean posts quickly become overtaken by newer posts. Consideration will therefore be given to other forms of recruitment in future.

IMPLICATIONS FOR MIDWIFERY PRACTICE AND FUTURE RESEARCH

The findings from this study have helped to identify gaps which will be explored in interviews with pregnant women/people in the next phase of this mixed-methods study.[24]

These include exploring further:

- The impact communication technology has on developing relationships between pregnant women/people and midwives within a midwifery continuity model of care.
- Issues around privacy and confidentiality of information when using devices.

CONCLUSION

Communication technology contributes towards quality maternal and newborn care through enabling pregnant women to connect with their midwife. Caution is needed in ensuring privacy of information is protected when using devices. This study highlights the need for wider professional discussions around this area. If pregnant people are comfortable and satisfied with how technology is being used, they are more likely to reach out to their midwife if they have concerns and feel confident their midwife will respond in a manner that is acceptable to them. **TPM**

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Appendix H.5

Regular Article

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Using an Online Platform for Conducting Face-To-Face Interviews

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Abstract

Semi-structured interviews are useful for exploring participants experiences, understandings, and opinions on a particular issue. Traditionally, interviews have taken place in-person however, because of in-person restrictions with Covid-19, and with the changing landscape of online connection, opportunities have arisen for how to conduct interviews using an online platform. The purpose of this article is to highlight the first author's experiences with using an online platform to conduct face-to-face interviews and the valuable contribution that online interviewing could offer as a valid research tool that differs to that of in-person face-to-face interviews. Online semi-structured interviews were conducted with fourteen midwives and five pregnant people from New Zealand using Microsoft Teams. Interviews were videorecorded and conducted as part of a larger mixed methods multiphase study to explore participants experiences with how they use communication technology to connect with one another. The interviews took place between September 2022 – May 2023. Two key areas which highlight the benefits and challenges with online interviews were identified. These were around the potential to 'capture the essence of the person' and through the flexibility of the technology in enabling FTF connections. Challenges were also noted around connectivity issues. Videorecording online interviews offered an ability to capture the 'essence of the person' through visual and auditory cues. These same cues were shown to assist with lipreading when transcribing inaudible words which can assist in the analysis of data. There were disruptions to some interviews due to interviewing taking place in the person's home and connectivity issues, however, these were felt to be minimal. Online interviewing should not be considered a 'poor relation' to in-person face-to-face interviews, but instead, a valuable option that contributes towards the growing body of knowledge around online interviewing as a valid research tool that is different from face-to-face.

Keywords

online platform, co-presence, flexibility and convenience, video conferencing

Introduction

Interviews are a way to explore in greater detail with participants their experiences, understandings, and opinions of a particular issue than would otherwise be possible through a questionnaire or survey (Burns & Grove, 1993; Gillis & Jackson, 2002). Traditionally, interviews have taken place in-person however, due to the ubiquitous nature of communication technology, a variety of online methods and platforms have arisen such as podcast interviews (Jorgensen & Lindgren, 2022; Newman & Gallo, 2019), or asynchronous and synchronous online interviewing (Bampton et al., 2013; Lobe & Morgan, 2021; Mirick & Wladkowski, 2019; O'Connor & Madge, 2017). Online interviews can take place either asynchronously through emailing questions to participants and gathering responses that way (Bampton et al., 2013), or via synchronous (real-time) means such as using an online chat room, face-to-face (FTF) via video technology which mimic an in-person FTF interview (Lobe & Morgan, 2021).

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Online interviews are increasingly being used via online platforms such as Skype, Facetime, Google Hangouts and Zoom and enable people in different geographical locations to communicate in real-time (Deakin & Wakefield, 2014; Gray et al., 2020; Hanna & Mwale, 2017; Jenner & Myers, 2019; Mirick & Wladkowski, 2019; Tucker & Parker, 2019). There are mixed responses within the literature regarding the advantages or disadvantages with online FTF interviews versus in-person FTF interviews. While online FTF interviews offer the opportunity to visually see the person and pick up on body language, the visual cues are limited due to only seeing the person from the shoulders up (Hanna & Mwale, 2017). 't Hart (2023) argues that the importance of being physically in the same space as someone else is necessary for an emotional connection that is 'fostered by the interviewer and participant sitting together in silence and communicating via the physicality of body cues' which is missing when moving to an online format (p. 23). Other studies have identified no differences between the two and found that participants are more likely to share when FTF online rather than in-person due to the space and distance with which the interview is taking place (Jenner & Myers, 2019; Self, 2021). For people who are socially awkward, or who feel uncomfortable interacting in-person, the online platform is possibly liberating as it enables connections to occur in a less confronting or intimidating manner than being in-person (Allred & Atkin, 2020). Online interviews have also been shown to be advantageous in enabling the participant to feel more comfortable without having to worry about inviting the researcher into their home or workplace (De Villiers et al., 2021).

Prior to the global Covid-19 pandemic, online FTF interviewing in comparison to in-person FTF interviewing was still considered relatively uncommon (Deakin & Wakefield, 2014; O'Connor & Madge, 2017), however, in response to restrictions on in-person FTF interactions, researchers needed to adapt the way they collected interview data during this time ('t Hart, 2023; O'Sullivan et al., 2021; Self, 2021). Technology is continually evolving, and alongside this, developments, and improvements in infrastructure to ensure equity and access to the technology. In New Zealand for example, there is recognition around the need for equity and accessibility to technology which will result in 99.8% of the population expecting to have access to broadband and mobile coverage by 2023 (New Zealand Health and Disability System Review, 2019). Globally, the need for connectivity is recognised as a basic human right, with the need to *"develop the infrastructure for information and communication technologies…to promote equitable, affordable and universal access"* (World Health Organization, 2021, p. 4). With the move to promoting equitable and affordable access to digital technologies, there is likely less tolerance towards undertaking costly travel to attend in-person meetings/interviews, if these can instead be conducted in an online format, and especially when considering the impact travel has on climate change. In November 2016, the legally binding international treaty on climate change known as the Paris Agreement came into force with the aim of limiting global warming to 1.5° C above pre-industrial levels by substantially reducing greenhouse gas emissions (United Nations Climate change, n.d.). As a result, New Zealand have set goals around reducing petrol and greenhouse gas emissions (Ministry for the Environment, 2022). So, moving qualitative data collection techniques to online forums has potential to contribute towards sustainability of our planet.

As people become more comfortable with accessing and using technology, they are potentially becoming less comfortable and more anxious with in-person FTF situations (Allred & Atkin, 2020; Rotondi et al., 2017). Further to this, society has become more familiar with using video technology to connect and communicate with one another as a result of Covid-19 restrictions on in-person contact both on a personal level and in the move to 'work from home' (Costa et al., 2022; Green et al., 2020). Use of video-technology has increasingly been used within healthcare through Telehealth which requires a video consultation between a health professional and health consumer (Lupton & Maslen, 2017; Ministry of Health, 2020). This could be considered not too dissimilar to interviews being conducted online by a researcher and participant.

The world is changing around how people are communicating with one another. Consideration is therefore needed on how to combine the best parts of in-person interviews with the best parts of communication technology to create valid and reliable ways of gathering data that not only captures the essence and benefits that comes with being 'in-person', but that are sustainable and economically beneficial for all concerned. There is a need therefore to open and develop further dialogue around how this might look when conducting qualitative FTF research. Is there a need for in-person interviews when they can just as easily be conducted in an online format? Can FTF interviews conducted in an online format still capture the 'essence' or 'nuances' of in-person connections, and if so, how can this be achieved? The implications are such, that problems with connectivity that were identified early on with technology may not be so prevalent in the 2020's given the improvements in infrastructure to create a more accessible and equitable service.

This paper reports on the experiences of the first author in conducting online FTF interviews with fourteen midwives and five pregnant women/people on how they use communication technology to connect with one another. It is important to note that asking participants about their experiences with being interviewed online did not form part of the interview schedule. Instead, the insights offered are based on the experiences with using an online platform to conduct the interviews. Any comments made by participants came up as part of the interview indirectly, however, they provide further insight into the overall discussions around how using an online format for conducting

interviews can be considered a valid research tool that is different from in-person FTF interviews.

Aim

The purpose of this paper is to highlight the first author's experiences with using an online platform to conduct FTF semi-structured interviews with midwives and pregnant women/people in New Zealand. The online FTF interviews provide insight into the valuable contribution that online interviews offer as a valid research tool that differs to that of in-person FTF interviews.

Methodology

A mixed methods multi-phase sequential transformative design was used to explore how communication technology is used between midwives and pregnant women/people in New Zealand. The theoretical framework guiding the research is the evidenced informed Quality Maternal and Newborn Care (QMNC) framework developed by leading midwifery researchers (Renfrew et al., 2014). The researchers undertook a meta-synthesis of qualitative studies which explored women's/people's perspectives and experiences of maternity care. A systematic review of studies reporting on workforce groups providing maternity care was also undertaken to identify effective and ineffective practices. The results from these analyses identified five essential characteristics that were needed to ensure high quality care that would meet the needs of women/people and their babies. The five categories informing the framework are (1) Identification of practice categories (aspects that were important to women); (2) organisation of care; (3) values; (4) philosophy; and (5) characteristics of the care providers. Their findings showed that when care was provided in an individualised and respectful manner, women felt strengthened and empowered (Renfrew et al., 2014). The framework therefore was ideal to explore how communication technology contributes towards quality maternal and newborn care through the identification of effective and ineffective communication technology practices used by midwives and pregnant women/people.

A transformative lens has also been taken throughout this mixed-methods research to 'give voice' to the participants in the study. A transformative lens "ensures improvement in human interests and society through addressing issues of power and social relationships" (Sweetman et al., 2010, p. 441). An opportunity to highlight a transformative approach is shown through identifying the potential contribution that FTF online interviews can make within the field of qualitative research. This is important, particularly within a culture of changing communication technology practices, where participants may not feel comfortable within an in-person setting (Biglbauer & Lauri Korajlija, 2023; Floridi, 2014).

Methods

Online semi-structured interviews were conducted with midwives and pregnant women/people during the second phase of a mixed method multi-phase sequential transformative study. In keeping with a sequential design, the findings from the online survey in phase one of the study informed questions for the semi-structured interviews in phase two of the study (Creswell & Plano clark, 2018; Teddlie & Tashakkori, 2009).

Setting

The online FTF interviews were conducted using Microsoft Teams with midwives and pregnant women/people in New Zealand from September 2022 – May 2023. The first author and participants were geographically dispersed around the country, and each connected online to the interview from their own homes.

Participants

In this second phase of the mixed methods multi-phase study, participants who had previously undertaken an online survey in phase one, had indicated they were happy to take part in an interview by clicking on the last question of the survey. This question took them to a separate window which asked them to provide contact details. Fourteen midwives and five pregnant women/people indicated they were interested in taking part in an online interview. The first author then emailed the participants inviting them to take part in an online interview. Once they had agreed to be interviewed, a participant information form and consent form were then emailed to participants and a time was then negotiated for the online interview. Online interviews took between 40-60 minutes.

Piloting the Online Interviews

Prior to commencing online interviews, a 'test run' using the Microsoft (MS) Teams platform was undertaken with a midwifery colleague who had not been involved in the online survey nor would be a participant in the online interview. Microsoft (MS) Teams was selected due to the first author's familiarity with using this platform. Despite this, there was still uncertainty around how conducting an online interview using the recording and transcription service would perform. Familiarity and comfort with the technology and interview guide are important prior to conducting interviews to identify any potential difficulties with the software (De Villiers et al., 2021; Gray et al., 2020; Hanna & Mwale, 2017; Tucker & Parker, 2019). Piloting the interview was beneficial as it enabled the first author to not only test the questions, but importantly, to identify if there were any issues with either the connectivity, recording or transcription function when using the platform.

Analysis

Thematic analysis was used to analyse the data. Braun and Clarke (2022) outline a six-step process which includes 1) familiarisation with data, 2) coding, 3) generation of initial themes, 4) developing and reviewing themes, 5) refining, defining, and naming themes, and 6) write up. The first author undertook the analysis of the data and met regularly with the other two authors to discuss the coding and development of themes.

Findings from the interviews are not included in this paper and are under review for publication in other journals. This paper however, reports on the experiences and insights gained from the first author in using an online platform to conduct FTF interviews. Ethical approval was obtained and granted by Auckland University of Technology Ethics Committee (20/279).

Findings and Discussion

Two key areas were identified by the first author that could potentially contribute towards the value of online interviews within the field of qualitative research. These areas highlight the benefits and challenges with online interviews. There are benefits with conducting online interviews through the potential to 'capture the essence of the person' and through the flexibility of the technology in enabling FTF connections. Challenges were noted around connectivity and participants' preferences for in-person interviews. The following highlight how these contributions are made using online FTF interviews. It is important to reiterate, that the findings and discussions are presented as insights that were gathered from the first author when conducting online FTF interviews with midwives and pregnant women/people.

Benefits with Online Interviewing

Capturing the 'Essence of the Person'. Online platforms such as MS Teams which include videoconferencing as one of its features enables both the participant and the researcher to connect from different locations and to 'be seen' synchronously in real time. When conducting the online interview, participants could choose whether to have their video camera on or switched off and all participants were asked whether they were happy for the interview to be recorded. These choices are part of a person's right to self-determination and autonomy (Borbasi & Jackson, 2016). Only one participant chose to keep their video off, and for this interview, the recording was solely audio-recorded, though the researcher kept their video on so was visible to the participant. Being visible to participants has been shown to be important in enabling participants to respond to the researcher's non-verbal cues as well as contributing towards establishing rapport (Archibald et al., 2019). It is acknowledged however, that there was not an ability for the researcher to pick up on visual cues during this interview, which could potentially impact on the quality of the interview, (Novick, 2008), however, the focus then became reliant on the intonations used with the participants voice, as would be the case if the interview was conducted over a telephone (Novick, 2008).

One of the main advantages with videorecording the online interview was being able to focus on what the participant was saying during the interview knowing that the visual cues and non-verbal/body language would be captured during the recording. Interviews with midwives and pregnant women/people were only conducted online, so it is not possible to make comparisons between in-person FTF or online FTF. However, there is evidence to suggest that when researchers have conducted both, there is little difference noted between the gathering of information between the two situations.

Jenner and Myers (2019) found that their Skype interviews closely resembled the in-person FTF interviews in terms of depth of data and information shared by participants. In a similar manner, Sedgwick and Spiers (2009) noted that their use of videoconferencing for interviews with students were conducted in a conversational type of manner due to the ability for participants to be FTF. This would suggest, that 'the essence' of being in the same space during the interview was able to be captured using an online format through the ability to visually respond to the participant's cues, maintain eye contact and conduct 'active listening' responses with umms and ahhs as would normally occur in an in-person FTF context. De Villiers et al. (2021) found that researchers use facial expressions and other forms of body language to build rapport when conducting interviews online via a videocall. This was the case for interviews with midwives and pregnant women/people. Maintaining eye-contact via a screen was enhanced by strategically placing the interview schedule in front of the laptop in an unobtrusive manner which encouraged asking and responding to questions in a more natural and conversational manner. This enabled eye contact to be maintained during the interview with just a quick glance to ensure areas were covered. Towards the end of the interview, the first author made a reference to the interview guide to ensure nothing had been missed.

Co-present, or absent presence are terms used to describe people being present but not physically in the same space (Gergen, 2002; Haddouk, 2015). Haddouk (2015) discusses the notion of presence at a distance, and the emotional connection that is still made despite not physically being in the same space as a person. Each of the participants in our study had been asked about their comfort when using technology, to gauge if there was a connection between usage and comfort level. All participants responded to being comfortable with using a variety of platforms when connecting with others. There is evidence to suggest that the more a person uses technology, the more comfortable and satisfied they are with using this technology (Swanson et al., 2018). There is further evidence to suggest that the more people use communication technology, the less comfortable they feel when in in-person

situations (Biglbauer & Korajlija, 2023; Rotondi et al., 2017). Floridi (2014) suggests how we use communication technology is changing the way we communicate which may potentially impact on future generations' comfort with in-person interviews. Online FTF interviews may be beneficial in helping to connect people who otherwise feel uncomfortable when in an in-person situation. The benefits in using the technology to enable these connections to occur can be highlighted further through the flexibility and convenience of the technology when undertaking online FTF interviews.

Flexibility and Convenience in Enabling Face-To-Face Connection. One of the key findings in our study conducted with midwives and pregnant people on how they use communication technology to connect with one another, highlighted the flexibility and convenience of the technology in enabling these connections to happen (K. Wakelin et al., 2023; K. J. Wakelin et al., 2023). In a similar way, the flexibility and convenience with how the technology was used was noted when undertaking FTF interviews using an online platform.

There was flexibility offered for participants to connect via technology through a link emailed to them. They could then join the interview via a computer, lap-top or mobile phone. This was advantageous as it enabled the researcher and participant to 'be present' virtually without the associated costs required in time and travel that would be required to attend an in-person interview (Archibald et al., 2019; Gray et al., 2020; Lobe & Morgan, 2021; Mirick & Wladkowski, 2019; Sedgwick & Spiers, 2009). As well, as having potential environmental benefits such as reducing greenhouse gas emissions (Ministry for the Environment, 2022).

The flexibility with using communication technology for online interviews has occurred all the way through the process. This began with emailing participants the information and consent forms prior to the interview beginning, using the online platform screensharing facility, and using the video-recording and transcription functions that are then easily downloaded onto a password protected device. The screen sharing facility on MS Teams enabled the first author to go through the participant information form and consent form with the participant at the beginning of the interview (just as they would if the interview was being conducted in-person FTF). Advantages of screensharing has also been identified with other online interviews (Gray et al., 2020).

Having conducted a trial run interview with a colleague prior to the first interview provided the first author with an ability to trust the functionality of the online platform. This trust provided a sense of freedom during the interview knowing that there would be opportunity to review the interview in its entirety at a later stage and to observe again verbal and non-verbal body language. This ability to relive the interview has similarly been identified as an advantage over in-person or telephone interviews (Sedgwick & Spiers, 2009). Being able to relive the interview through watching the videorecording was invaluable during both the familiarisation and coding phases as part of thematic analysis (Braun & Clarke, 2022). The first author was able to be transported back to the interview and listen and observe the nuances, facial expressions, and body language of the participant during the interview.

Following the recording, the transcription was downloaded onto an electronic word document. The videorecording was then reviewed against the transcription. The video recording function enabled play forward 10 seconds, and play backwards 10 seconds along with pause, play and stop functions. It was convenient to be able to rewind by 10 seconds, as this was often all that was needed if there was a word that was slightly inaudible, or if the transcription had incorrectly scribed a word. In these situations, rewatching the video provided an ability to lipread while listening to what the participant was saying so that the correct word could be identified. Without this ability to view the recording, transcribing would have been more difficult and potentially more time-consuming while trying to play and replay to capture the inaudible word. For example, in the interview with pregnant woman/person, Jane (not her real name), the original transcript from the Teams recording was:

> "I kind of said to her if it was ever an emergency or mastering that I wanted to know, I would call" (Jane).

The word 'mastering' didn't seem to be in context, however, when the recording was reviewed, the first author was able to lip-read while listening to Jane. In doing so, was able to correctly identify that what Jane said was:

> "I kind of said to her if it was ever an emergency or a fast thing that I wanted to know, I would call" (Jane).

The term a 'fast thing' made sense, as Jane was discussing what she would need to do if she needed to contact her midwife quickly.

While reviewing the transcription still took time (approximately 3 hours for a 45-min interview), being able to capture both the video recording and transcription at the same time using the functions available on the computer was an efficient way to collect data. Further to this, having an ability to relive the interview by watching the recording gave the first author a sense of being back in the interview when transcribing and analysing the data. It was also convenient to make notes in a comment box using the 'review' tab on the word document alongside the transcriptions as various thoughts came to mind, adding to the convenience with using technology.

The convenience with attending an online interview which could be attended by the participant from their own home, meant all participants attended the interview. Deakin and Wakefield (2014) also found a similar finding in their study with all participants showing up to online interviews. The flexibility and convenience with using technology was further

highlighted when communicating with a participant who had been unable to attend their initial interview due to an adverse weather event which had cut electricity and internet. A follow-up email was sent to the participant by the researcher, and another day and time was negotiated. In another incident, a midwife was running late due to the on-call nature of midwifery practice and had texted the first author. The online interview was delayed by half an hour. In these situations, the challenges brought about in using communication technology could have impacted on the interview, however, the convenience with the technology meant it was easy to re-connect and re-schedule for a later time. The convenience with being able to communicate and reschedule appointments were similar findings reported by participants in our study when using communication technology to connect with one another (K. J. Wakelin et al., 2023).

Challenges with Online Interviewing

While online interviews were conducted with 19 participants, only one of the participants in our study indicated they would have preferred an 'in-person' interview rather than online due to an inability to fully get a sense of the person. As indicated earlier, participants weren't asked about their experiences with being interviewed online, however Alana (not her real name) offered this insight during the interview.

> "I wanted to do it [interview] in person because there's a whole lot of nuances from you that I can't read. There's your body language that I can't read. I can see you like you see me from here up, but that's only a quarter of the picture. There's a whole lot of communication that's just not here. And to me, I'm only getting a little bit, I suppose, because I'm such a visual person with my complexities around reading and writing" (Alana).

't Hart (2023) suggests that the screen acts as a barrier as there is a lack of emotion when not physically present with another person and reduces the connection to a disembodied one, where the person is visualised from the shoulders up. Hanna and Mwale (2017), would agree with having identified the online video call as limiting the ability to pick up on the essence of the person. While Alana's preference would have been for an 'in-person' interview, she also accepted that due to the challenges and uncertainty around isolation requirements with Covid-19, online FTF interviews were the next best thing to being in-person, as you can still 'see the person'. De Villiers et al. (2021) also found a similar finding in their study, when in-person FTF interviews were unable to be conducted.

The initial uncertainties presented by Covid-19 and the potential for social distancing requirements, was potentially problematic with conducting in-person FTF interviews. However, it has highlighted how using an online format to conduct FTF interviews is not only a valid way to gather data but can be a preferable option for participants when given the choice. Once Covid-19 isolation restrictions were lifted, participants were offered an opportunity for online or in-person interviews. These later participants chose to be interviewed online and negotiated for these interviews to take place when they were at home during the day. This would suggest that participants felt more comfortable and relaxed being interviewed in their own environment.

There is evidence to suggest that being interviewed at home via an online platform can be challenging if there are interruptions or distractions (Deakin & Wakefield, 2014; Seitz, 2016). Brief interruptions were noted with some of the interviews taking place in the participants' homes. In one of the interviews, the participant's dog began barking (in another room), another participant responded to a phone call during the interview, and in a third situation, the participant was expecting a delivery. In the first situation, the recording continued while the participant attended to their dog. In the second situation, the researcher paused the recording during the phone call, out of respect for the private conversation between the midwife and their client. In the last situation, the participant asked for the interview to be stopped while they attended to the delivery matter and then reconnected afterwards. In each of these situations, the flow of the conversation was interrupted, and therefore there was potential for this interference to have impacted on the integrity of the interview. However, the participants seemed able to pick back up on the discussion with prompting from the researcher.

The first author when reflecting on the interviews noted, that in the first two situations, the participants didn't ask for the recording to be stopped or paused. It appears they had almost forgotten the recordings were taking place. It may be, that due to the 'Covid times', people had become use to connecting online with family and friends while continuing with their normal routines. Or possibly, because the interviews were not taking place in-person, the disruptions seemed less obvious to the participants. For example, had the phone call happened during an in-person interview, the participant may have excused themselves to another location to undertake the conversation, as the researcher would have been physically sitting in the same room as the participant. Lee (2004) noted in their review on the use of recording devices with interviews, that the unobtrusive nature of the tape recorder when used for interviews may serve to desensitize a participant's experience. This could be one explanation for why the participants seemed unaffected by the online videorecording of the interview, and why pausing of the recording was not asked for by the first two participants in the scenarios described above.

A potential challenge around the functionality of using video technology when conducting online FTF interviews, is the reliance on the connectivity or the internet. Poor internet connections can be problematic in that it can interfere with the flow of the interview and can therefore compromise the quality of the data collection (Deakin & Wakefield, 2014; Hanna & Mwale, 2017; Mirick & Wladkowski, 2019). However, in the online interviews conducted with midwives and pregnant people, this was only an issue in one of the interviews and

once the researcher became aware, was able to repeat the question. The video had frozen but not the audio connection. There didn't appear otherwise to have any disruption to the flow, and in fact, it provided the researcher with another opportunity to ask the question and the participant an opportunity to expand further on what they had initially been saying.

Limitations

A limitation of this paper is that the findings and discussion draw on the insights identified by the first author while interviewing participants in phase two of a larger mixed methods multi-phase study. This paper is unable to report actual findings around the participants experiences with being interviewed in an online format. However, they do highlight the potential for further research opportunities around using online platforms for conducting FTF interviews.

One participant chose not to have their video on during the interview. Further exploration around 'camera off' within the context of an interview, could be further explored.

Recommendations

There are two recommendations to be made which support using an online platform when conducting FTF interviews.

1. For participants who may not feel comfortable with in-person FTF interviews, online interviewing offers an opportunity for people to feel comfortable when connecting with a researcher. This is important, as it perhaps provides an explanation for why offering interviews using an online platform are a valid and beneficial way to gather data.
2. Using an online platform for conducting interviews should not be considered a 'poor relation' to in-person FTF interviews, but instead can help contribute towards the growing body of knowledge around online interviewing as a valid research tool that is different from FTF.

Recommendations for Further Research

This paper highlights the valuable role online platforms offer when conducting FTF interviews. Further research is needed to validate this method which could also help with achieving global environmental and climate goals through reducing the need for extensive travel. This could include:

1. Interviewing researchers on their experiences with using online platforms when conducting in-person interviews.
2. Interviewing participants on their experiences when interviewed by a researcher using an online platform.

Conclusion

The decision to undertake online interviews FTF via video technology with midwives and pregnant women/people was initially a pragmatic one due to the challenges with the global Covid-19 pandemic and restrictions around in-person contact. However, given the changing landscape with how communication technology is used to enable people to connect, the first author's experiences with conducting FTF interviews via an online platform, highlights the valuable contribution that online platforms offer as a valid research tool. They enable the essence of the person to be captured through responding to visual and auditory cues from the participant and to conduct the interview in a conversational type of manner. The ability to visually lip read what the participant is saying if there were missed words during the recording was valuable in contributing towards the analysis and interpretation of data that was used in phase two of the mixed methods multi-phase study with midwives and pregnant women/people. There is convenience in being able to conduct interviews online FTF from geographically dispersed locations which saves time and resources for both the researcher and participant and helps to contribute towards meeting global environmental goals. While connectivity and disruptions were identified in a few of the interviews, these appeared to have minimal impact.

This paper highlights the valuable contribution that online FTF interviewing can potentially offer when conducting interviews, and to be considered as a valuable option for data collection alongside in-person FTF interviews. There will always be some people who prefer the in-person experience, however, for others, having the ability to conduct interviews FTF via an online platform is just as effective and in fact may be preferable.

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Author Contributions

This manuscript is the first author's (Karen Wakelin) original work and will be included as part of her PhD thesis with publication. Karen Wakelin: Conceptualisation, Formal Analysis, Investigation, Writing-Original draft. Judith McAra-Couper: Reviewing and Editing. Tania Fleming: Reviewing and Editing. 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.

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Ethical Approval

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