



**SUDI PREVENTION
COORDINATION SERVICE**

MAORI PUBLIC HEALTH

mama aroha



**A research report about a digital breastfeeding resource
to improve support for māmā**





We would like to thank everyone who has participated in the research undertaken. It was a huge honour to work with:

- The fabulous young Māori māmā.
- Amy Wray and the Mama Aroha brand and intellectual property
- Fay Selby-Law and Hāpai te Hauora Sudden Unexpected Death in Infancy (SUDI) Prevention Coordination Service
- Carmen Timu-Parata, Jane Cartwright and the New Zealand Breastfeeding Alliance
- Breastfeeding Friendly Hospital Initiative (BFHI) Coordinators, GPs
- Tash Wharerau, Te Rōpu Whakaruruhau, the Infant and Young Child Feeding Committee, Ngā Wānanga o Hine Koopu, Women's Health Collective
- Gayle Moana Johnson Researcher
- Dr Felicity Ware Te Puna Whakamaunu Research unit Hāpai te Hauora, Mokopuna Ora, Te Putahi a Toi, Massey University
- Dr Angelique Reweti School of Health Sciences, Massey University

Funded by a Health Research Council Activation Grant 21/1069

Report prepared by: Ware, F., Moana-Johnson, G., Wharerau, T., Timu-Parata, C., Selby-Law, F. Reweti, A., Wray, A., Cartwright, J. 2023

Artwork & Report designed by Ben Thomason, Hāpai Te Hauora.

mama aroha

A research report about a digital breastfeeding resource to improve support for māmā



SUMMARY

Waiū is a taonga and fundamental aspect of ūkaipō requiring protection and promotion as part of whānau ora. Most Māori women do intend to breastfeed and achieve high rates of exclusive breastfeeding prior to leaving a maternity facility, however this rate drops off dramatically by the time pēpi reaches 3 months of age, with less than 50% exclusively breastfed (and at 6 months only 20%). Research has identified many challenges that hinder Māori babies receiving breastmilk although there is still more work to identify effective breastfeeding support for Māori, especially with the opportunity that digital health innovation offers. Increasing the exclusivity and duration of breastfeeding is a key determinant of pae ora and one of the most significant and cost-effective ways to improve equity and increase the health and wellbeing of a population.

The development of the first indigenous breastfeeding digital application Mama Aroha during the COVID pandemic exemplifies Māori women at the forefront of developing innovative solutions to support whānau with breastfeeding. The Māmā Aroha Breastfeeding Principles and Information App (launched August 2nd 2021) includes the most essential information and key principles to breastfeeding and is designed to be visual and informative, making it an easy to follow tool for health professionals, mothers and whānau. The content within this application has been approved by the New Zealand Ministry of Health and endorsed by NZBA and Hāpai Te Hauora. The app is free for hapū māmā, whānau and health professionals to download and use.

By July 2023 the App had been downloaded nearly 15,000 times almost entirely from Aotearoa and mostly from mobile devices (90%). Download data shows that when people look for the app they

mostly find it and download it. When the App was first launched it was the highest ranking education app in New Zealand. It has sustained relevance and engagement and is still in top 100 most downloaded education apps in New Zealand.

This Health Research Council funded project about the app aimed to activate research to improve ūkaipō knowledge, experiences and outcomes for Māori whānau. Via a range of methods the team gathered responses from māmā, whānau and health professionals. The feedback covered aspects of the app such as accessibility, usability and content, as well as how the app supported the breastfeeding journey. Findings confirmed that for Māori, a holistic Kaupapa Māori approach to breastfeeding is central to healing from (intergenerational) trauma and strengthening the intergenerational transmission of knowledge and support. Results also confirmed that Mobile Health resources need to be accurate, free and easily accessible, be engaging and interactive, and practical.

The research makes recommendations to inform the design of effective breastfeeding support for Māori particularly around digital health resources. It is recommended that investment be made in developing the first indigenous breastfeeding app to update the content according to the most recent evidence provided by health professionals as well as to develop a tutorial on how to download, use and navigate the app and its functions. It also recommends further promotion of the app with additional online support, integration into local and national breastfeeding services, and use within training and education for health professionals. In keeping up with changing technology, the development of interactive functions, such as a chatbot, that provide whānau with the ability to

track their own progress in terms of health and wellbeing, are also important considerations.

Amy Wray is the Mama Aroha resource creator, a lactation consultant, a Māori breastfeeding expert, and member of Te Rōpu Whakaruruahu: The Māori advisory group to NZBA.

Fay Selby-Law (Ngāti Porou, Ngāti Raukawa ki te Tonga) works in the Te Aka Whai Ora funded National Sudden Unexpected Death in Infancy (SUDI) Prevention Coordination Service at Hāpai te Hauora and is leading a coordinated and consistent approach to prevention methods and culturally responsive methodologies in the maternal child health sector.

Carmen Timu-Parata (Ngāti Kahungunu) is the Māori advisor to The New Zealand Breastfeeding Alliance (NZBA) which is a collaborative of breastfeeding member organisations established in 1998 to promote, protect and support breastfeeding in New Zealand. NZBA is funded by the Te Whatu Ora to manage the Baby Friendly Initiative (BFI) programmes for hospitals and communities, including awarding accreditation certificates.

Jane Cartwright is the Executive Officer of NZBA, Dietitian and involved in health system development and clinical governance.

Tash Wharerau (Ngāpuhi, Te Mahurehure) is the Co-Chairperson of NZBA, Co-Chairperson of the newly established Infant and Young Child Feeding Committee, a Māori breastfeeding advocate and Women's Health Promoter at Women's Health Action. Tash also facilitates breastfeeding kōrero in Ngā Wānanga o Hine Koopu in Te Taitokerau.

Gayle Moana-Johnson (Ngāti Tūwharetoa) is a dedicated māmā of 3 tamariki and a passionate advocate for rangatahi. Gayle's passion to support whānau began from her own upbringing which led her to work in various spaces such as mental health and addictions, Teen Parent Units, Red Cross, and community research.

Dr Angeliqe Reweti is Ngāpuhi and a Senior Lecturer and Researcher at the School of Health Science at Massey University. Her work emphasises the importance of collaborative efforts between health professionals, community organisations, and whānau to better support outcomes for individuals and communities as a whole.

Dr Felicity Ware is Ngāpuhi and is raising three tamariki with te reo as their first language. Felicity was a senior lecturer in Hauora at Massey University and now leads the research unit at Hāpai te Hauora. Her personal research focuses on the role of Māori culture, language and identity in supporting wellbeing particularly for rangatahi and parents.



▶ CONTENTS PAGE

Summary	4
Introduction	8
Māori and breastfeeding	8
Breastfeeding imperatives	10
Mama Aroha curriculum	11
Digital resources	14
Mama Aroha app	15
Research Process	18
Results	19
Online Survey Snapshot	24
Kōrero with hapū māmā	28
Limitations	33
Discussion and conclusion	33
Breastfeeding support for Māori	33
Accurate, accessible and timely health information	34
Digital tools	34
Recommendations	36
References	38
Appendices:	40
Information sheet	40
Interview questions	41



INTRODUCTION

The development of the first indigenous breastfeeding app Mama Aroha exemplifies Māori women at the forefront of developing whānau ora solutions to support Māori women to breastfeed. This project about the app aimed to activate research to improve ūkaipō knowledge, experiences and outcomes for Māori whānau. After reviewing relevant literature and digital resources the team gathered responses from māmā, whānau and health professionals

about the app via a range of methods. The feedback covered aspects of the app such as accessibility, usability and content, as well as how the app supported the breastfeeding journey. The findings of this research will help to improve the app, its use and promotion, as well as make recommendations to inform the design of effective breastfeeding support for Māori including digital health resources.

MĀORI & BREASTFEEDING

Breastfeeding is a taonga (treasured gift) and fundamental aspect of tikanga requiring protection and promotion. Before colonisation of Aotearoa all Māori infants were breastfed (Papakura, 1938). If the biological mother could not breastfeed, then another member of the whānau would (Glover et al, 2008). Colonisation, urbanisation, the medicalisation and hospitalisation of birth, sexualisation of breasts, and the commercialisation of breast milk substitutes have contributed to environments that have undermined breastfeeding as a normal indigenous cultural practice. Women are no longer being taught and supported by the father of the pēpi and other women within the whānau. Māori women are now more likely to be taught in clinical settings by health professionals who are less likely to be Māori or whānau.

Māori women also access maternity care less and have less satisfaction with the care they do receive, citing cultural incompetence and racism.

This is compounded by common issues of access to healthcare such as cost, travel, parking, childcare, availability of appointments, and wait times. Not surprisingly, Māori babies experience worse health and social outcomes including decreasing breastfeeding rates.

Most Māori women know of the benefits and risks of breastfeeding and intend to breastfeed with breastfeeding mostly considered as normal and expected within their whānau. Māori women achieve high rates of exclusive breastfeeding prior to leaving a maternity facility and when pēpi is 2 weeks old (Glover, Manaena-Biddle & Waldon, 2007). However, this rate drops off dramatically by the time pēpi reaches 3 months of age when less than 50% are exclusively breastfed and at 6 months only 20%. A compounding factor could also be that Māori māmā leave the birthing facility earlier, therefore giving a false high for exclusive breastfeeding at discharge.

There are many challenges that hinder Māori babies receiving breastmilk and increase the likelihood of introducing artificial milk and solids early such as:

- Lack of, or no, antenatal and childbirth education.
- Lack of breastfeeding intention, self-efficacy and social support.
- Lack of knowledge of breastfeeding recommendations and changes over time.
- Limited or lack of culturally effective maternity services.
- Lack of postpartum support especially when life circumstances change.
- Difficulty establishing breastfeeding within the first six weeks.
- Poor, inadequate or untimely professional support;
- Perception of insufficient milk supply.
- Confusion about smoking while breastfeeding.
- Uncertainty about the safety of bed sharing.
- Grandparents wanting to care for infants.
- Maternal tiredness.
- Antenatal depression.
- Vaccine indecision.
- Younger mothers still wanting to socialise, embarrassment – particularly in public.
- Returning to work.
- Inadequate, conflicting, disempowering advice.
- Lack of connection to Te Ao Māori (Māori worldview) and tikanga Māori (Abel, Park, Tipene-Leach, Finau, & Lennan, 2001; (Bennett, Gilchrist, Menzies, Harwood, Kingi, Atatoa Carr, Morton, Grant 2022; Glover et al., 2007; Glover et al., 2009; Glover, Manaena-Biddle, et al., 2008; Kenney, 2011).

There is little published research about effective breastfeeding support for Māori, especially in the area of digital health resources. Interventions delivered within a Kaupapa Māori framework will best address breastfeeding inequities in Aotearoa New Zealand (Technical Advisory Services, 2020). Promotion of breastfeeding to Māori should focus on re-establishing breastfeeding as a tikanga (right cultural practice) as part of whānau ora, rather than a perceived lifestyle choice (Gabel, 2013). The breastfeeding journey of the pēpi begins during hapūtanga with their whānau kōrero and knowledge about establishing and maintaining relationships (Ellison-Loschmann, 1997). Partners, fathers and whānau need to be involved in breastfeeding support (Glover, Manaena-Biddle & Waldon, 2007b). It 'takes a village to breastfeed', surrounding the mother with a support network that is able to 'mother the mother' (Faoase, 2019). Ūkaipōtanga (nurturing) is imperative and positively impacts on her experience (Reinsfeild, 2015). Continuity of care from prenatal to postnatal period and beyond is critical particularly between the hospital and returning home in the first week with home visits and then focused care for the first 6 weeks. Care from health professionals and peers who are able to engage with Māori is critical with midwifery care/well child/tamariki ora and other services provided by Iwi health providers being well positioned to provide a service that positively assists mothers in the continuity of their breastfeeding. Supportive workplace environments, and flexible working conditions with paid expressing/ breastfeeding breaks are enablers. Iwi and hapū could also develop their own systems and programmes to support Māori mothers and to promote, revive, and assert traditional mothering philosophies.

BREASTFEEDING IMPERATIVES

Global Public health recommendations state that infants should be exclusively breastfed for the first six months of life, with continued breastfeeding to age two years and beyond (World Health Organization and United Nations Children's Fund 2003).

The National Breastfeeding Strategy states that "Increasing the exclusivity and duration of breastfeeding is a key determinant of public health. It is one of the most significant and cost-effective ways to improve equity and increase the health and wellbeing of a population."

There are significant and persistent inequities in breastfeeding in Aotearoa New Zealand. Māori breastfeeding rates are significantly lower than non-Māori rates and are continuing to decrease.

Breastfeeding strengthens mental wellbeing, attachment and bonding and is a protective factor against health issues disproportionately affecting Māori such as Sudden Unexpected Death in Infancy (SUDI), breast cancer, obesity and diabetes, and allergies/asthma/eczema.

Increasing breastfeeding for Māori babies will contribute to pae ora (flourishing futures). This research about the use of the app helps to achieve the following objectives of the Breastfeeding Strategy:

- Consistent, evidence-based breastfeeding and infant feeding education is provided to all people working with pregnant women, infants and children.
- Whānau have access to consistent, evidence-based, culturally responsive breastfeeding information and support.

And the first three outcome areas:

- ▶ **Outcome 1:** Breastfeeding parents and their whānau have equitable access to a range of culturally appropriate breast and infant feeding supports.
- ▶ **Outcome 2:** Breastfeeding parents and their whānau are supported by increased community education, resources and awareness.
- ▶ **Outcome 3:** The maternal and child health workforce has the training, capacity and support to actively protect, promote and support breastfeeding.

This research will help to build an example of what works for Māori aimed at reducing existing inequities, increasing accessibility to culturally meaningful health information, and improving hauora with the best start to life.

MAMA AROHA CURRICULUM

According to the Mama Aroha website (<https://www.mamaaroha.co.nz/>)

Mama Aroha means 'mother love' in Māori. It is the vision of the creator Amy Wray

"to create high quality and innovative breastfeeding tools that will enable health providers to empower all mothers to breastfeed. We aim to provide accurate and appropriate information that is set out in a way that is quick and easy to understand for both the mother and the health worker."

The 'Breastfeeding Talk Cards' were developed by board-certified Māori lactation consultant Amy Wray over 10 years ago (2010). The cards are a well-established, breastfeeding tool within Aotearoa and internationally. The cards are designed to support breastfeeding mothers and health professionals (nurses, midwives, lactation consultants, breastfeeding peer support in general) who are helping mothers with their breastfeeding, particularly when they are experiencing problems. The cards connect visuals and kupu Māori to provide a more visually informative resource that is easier to understand.



Figure 1 Picture of Mama Aroha Talk Cards

Review of the Mama Aroha resources from health professionals

A Plan Do Study Act (PDSA) evaluation of the Māmā Aroha cards was undertaken by Central Regions Technical Advisory Services (TAS) in Hawkes Bay with Plunket health professionals about which content of the Mama Aroha resources are useful and when (2021). The aim was to see if using the Mama Aroha cards can improve the rate of breastfeeding (full/exclusive/partial) by 10% at 6 months of age.

The Plan-Do-Study-Act (PDSA) is a four-stage problem-solving model used for improving a process or carrying out change. It is an iterative cycle for testing a change – by planning it, trying it, observing the results, and acting on what is learned. This is the scientific method, used for action-oriented learning.

- The project used the following measurements to determine when a change is an improvement:
- Mother's report increased knowledge of breastfeeding
- Common breastfeeding issues are identified
- Breastfeeding continues to at least six months of age
- Nurses and Kaiāwhina report feeling confident in their use
- Identified change champions
- Narratives report positive outcomes

MAMA AROHA CURRICULUM

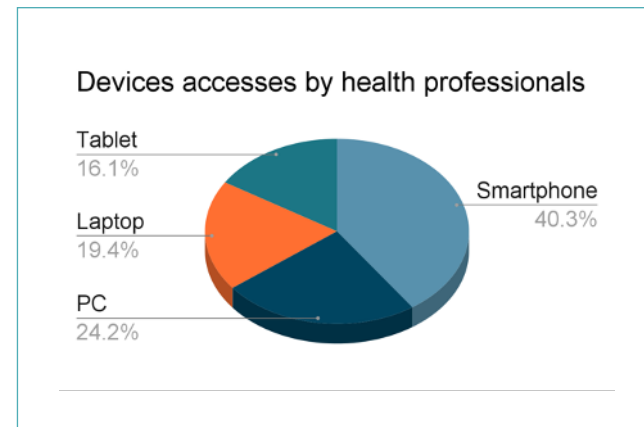
Mama Aroha card use was documented for 62 Client Interactions from 10 breastfeeding mothers of babies <6 months old and who are considering stopping BF. Supply, latching and cracked/sore nipples were the top 3 most common breastfeeding issues identified by staff. The 8 most commonly used Mama Aroha cards by Plunket staff were:

- Supply and demand
- Breastmilk capacity
- Letdown
- Signs of a good latch
- Ways to help letdown
- Low vs high fat milk
- Common positions
- Cluster feeding

The conclusion was to adopt the Mama Aroha cards which were overwhelmingly viewed as positive by the mothers and Plunket Nurses who participated in the improvement cycle. Recommendations were to follow up on the impact at 6 months on these babies and explore how to embed, promote and sustain the use of the cards.

NZBA also shared some basic feedback from health professionals, mostly Breastfeeding Friendly Hospital Initiative (BFHI) Coordinators about the usefulness of the Mama Aroha curriculum and how it could be presented in an app.

Most health professionals and māmā have access to smartphones. While some health professionals also have access to laptops, PC's and tablets, most māmā do not.



Most agree that an app developed from the Mama Aroha resources would be an effective tool and provided the following justifications about the resources:

“simple wording, excellent photos.”

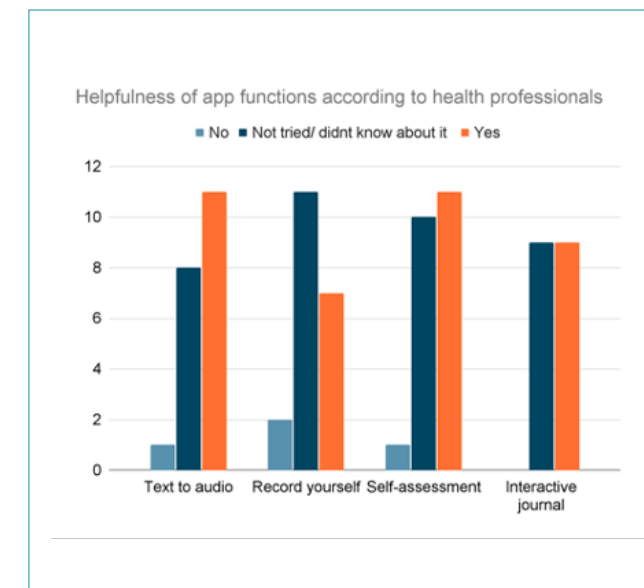
“clear and easy to understand. beautiful pictures”

“simple, effective, good use of language, colourful attractive”. “great visual aid for women”

The health professionals preferred to leave the following resources with māmā/ whānau: paper hardcopy pamphlets such as ‘Mama aroha my breastfeeding booklet’, local breastfeeding support groups and services, la leche league pamphlets. They also recommended website links eg www.kellymom, global health media, as well as apps such as [breastfednz](#).

MAMA AROHA CURRICULUM

While about half of the health professionals do see the different functions of the app being helpful in the learning experience, many also were not aware of the function or had not tried something similar and so were sceptical about the usefulness of such functions.



Health professionals also emphasised the need for an app to not require the use of data particularly if the functions were to be used by remote rural women and whānau.

There was also a suggestion to translate the app or the audio function into other commonly spoken languages, particularly Pasifika languages. While the interactive diary/journal function was similar to the function offered in the Bubble app which was identified as very useful, there were also concerns about the function as potentially causing anxiety.

The following areas or sections were identified as needing to be updated or added: antenatal expressing, storage of expressed breastmilk and sharing breastmilk, normal output and supply, the role of dads/ supporting people, more photos of different latching positions while māmā is reclined, SUDI messaging.

The high number of responses that did not know about the different proposed functions demonstrate the need for digital resources to be included in breastfeeding training and for the functions to be promoted and demonstrated.

The feedback from the health professionals about the usefulness of the Mama Aroha talkcards and their translation to an App was overwhelmingly positive.



DIGITAL RESOURCES

Internet websites and smartphone apps have become a popular resource to guide parents in the care of their children including feeding and nutrition. Younger generations in particular are accessing and prefer to access health information online (Taki, Campbell, Russell, Elliott, Laws, Denney-Wilson, 2015). A digital resource can help reduce common access issues particularly if it is free of charge and does not require data. However, there are concerns regarding the quality of information provided in digital resources and the cultural responsiveness of the content and aesthetics.

A mobile application or app is a computer program or software application designed to run on a mobile device. There is one other current New Zealand breastfeeding app called Breastfed NZ created by Midland District Health Board in 2015 and provided free of charge. The app provides information about various aspects of breastfeeding, from how to prepare for breastfeeding during pregnancy, through to the first few days and the early weeks. It provides guidance on common issues such as latching and positioning your baby, hand expressing and breast care. In addition, the app has information on more unusual issues such as breastfeeding twins and early babies (premature), and frequently asked questions around breastfeeding such as medicines, contraception and smoking when breastfeeding. The App has a website and a moderated facebook page <https://www.facebook.com/BreastFedNZ> to promote the app and answer breastfeeding related enquiries administered by the Midlands breastfeeding service. The app is currently being reviewed and updated.

According to the Healthify (previously Health Navigator) website, the Breastfed app: is slow with all the information needing to be downloaded as you open each section, rather than it all being there already. A lot of the information isn't referenced, and there is extensive use of anecdotes which can be misleading. Some sections remain unwritten such as the vaccination section. There is no search function, and the "quick find" page doesn't have links

to the actual contents. The tongue tie section was not completely accurate and up to date. It doesn't properly convey that tongue-tie is not responsible for problem breastfeeding for the vast majority of infants with the condition, and that upper and posterior ties should not in general be treated. While the pictures and diagrams are very nice, videos would be helpful and it has limited interactive tools. (<https://www.healthnavigator.org.nz/apps/b/breastfed-nz-app/>). The app has not been evaluated for effectiveness with Māori māmā.

The Tuku Iho app created by National SUDI Prevention Coordination Service at Hāpai te Hauora in 2022 is a resource for whānau hapū, māmā hapū and māmā hou that shares intergenerational knowledge in maternal and child wellbeing. The app includes some basic information about breastfeeding and is also supported by a website to help promote and access the app. The app has videos of testimonials of whānau sharing about a range of experiences, text to audio tool that can be disabled, is bilingual in te reo Māori and English and has swiping and scrolling functionality. The app is free and does not use data.

Ūkaipō is another free and easily accessible digital resource produced in 2020 by The Canterbury Breastfeeding Advocacy Service based in Te Puawaitanga ki Ōtautahi Trust (a kaupapa Māori NGO that offers several services primarily for māmā and pēpi). Ūkaipō is a series of videos that explores the challenges and joys of breastfeeding in relation to the Māori creation story. In these videos, the stages of Te Kore, Te Pō and Te Ao Marama relate to the different stages parents encounter when breastfeeding and parenting a newborn pēpi. The creation story teaches us that all things are cyclical – the challenges, growth, development and joys that our pēpi bring, and help us to grow as parents. As whānau, we come through challenges and experience the light and the darkness together, always growing and always changing.

MAMA AROHA APP

In the early stages of the COVID pandemic, when public health guidelines restricted the provision of in-person health services to prevent the spread of the disease, a group of wahine decided to quickly develop the talkcards into an app so māmā, whānau and health professionals could use them in the comfort of the home.

The development team consisted of the app owner/content expert (Amy Wray), SUDI prevention coordination service Hāpai te Hauora (Fay Selby-Law and Nari Faiers), New Zealand Breastfeeding Alliance (Carmen Timu-Parata and Jane Cartwright) and Mokopuna ora who provide wahakura wānanga in the Midcentral region (Felicity Ware). Māori tech company Kiwa Digital provided the technical skills to build the app and with little funds produced a minimum viable product.

The Māmā Aroha Breastfeeding Principles and Information App launched August 2nd 2021 is the newest iteration of the Talkcards and includes the key principles to breastfeeding. This toolkit is designed to be visual and informative, making it an easy to follow tool while learning the art of breastfeeding. The App provides health professionals, mothers and whānau with the most essential information and principles to better understand breastfeeding. The content within this application has been approved by the New Zealand Ministry of Health and endorsed by NZBA and Hāpai Te Hauora.

By February 2023 the app had been downloaded 12,440 times entirely from Aotearoa and mostly from mobile devices (90%). There is high awareness about the app with almost 90% of downloads resulting from people searching for the app mainly on the Apple app store.

The app has an outstanding conversion rate on impressions (47% top 10 result) which means that if people find the app they will download it. While the app is free for hapū māmā, whānau and health professionals to download and use, its promotion and updating needs ongoing support.

The digitisation of the Mama Aroha resource presents an opportunity to find out how the digital resource is promoted, accessed and used, its appeal to māmā, usefulness for both māmā and health/supporting professionals, and whether it contributes to improved breastfeeding knowledge, experiences and outcomes, and reducing inequity, particularly for Māori.



Figure 2 Photo of Dr Felicity Ware, Fay Selby, Amy Wray, Carmen Timu-Parata, Nari Faiers at app

KŌRERO FROM THE APP LAUNCH:

"We believe this tool assists health professionals to help whānau Māori and others to successfully breast feed for longer. As an indigenous and distinctly Māori tool it was the right and appropriate stand for us. We see Amy as a wahine toa and wanted to support her in the continuing development of this resource."

Selah Hart, CEO Hāpai Te Hauora

"It's about reclaiming that knowledge space and giving it back to whānau and their hands and empowering them. The mahi that has gone into it has been inspired by real women and real whānau on a grassroots level. For mums who are new to breastfeeding, we want to break down the barriers as much as possible."

Amy Wray, Māmā Aroha

"Well done Amy! Watching from Local Doctor's clinic. Thank you for sharing your journey & love your mahi, super excited to share this App with our Hapū Māmā & Whānau."

Facebook post at launch

"Ngā mihi nui Amy, incredible mahi for all our māmā, pēpi and whānau on their breastfeeding journeys. Such an inspiration! We can't wait to share this taonga with our māmā and whānau!"

Ngāti Whātua-Māori Public Health



RESEARCH PROCESS

The aim of the project was to activate research about improving breastfeeding knowledge, experiences and outcomes for Māori whānau. This included:

1. Reviewing relevant breastfeeding support and digital health literacy literature for indigenous peoples/Māori,
2. Obtaining feedback from Māori whānau (and health professionals who work with Māori whānau) about the efficacy of indigenous digital breastfeeding support (Mama aroha) to improve breastfeeding knowledge, experiences and outcomes, especially with young Māori parents.
3. Making further recommendations about improving breastfeeding knowledge, experiences and outcomes through digital health literacy for indigenous peoples/Māori and breastfeeding.

An approach based on Kaupapa Māori, whānau ora, Te Tiriti o Waitangi, mātauranga, and tikanga such as rangatiratanga (independence/ self-determination), whānaungatanga (relationship building), and manaakitanga (care and respect), guided the research. Regular kōrero and hui enabled robust relationship development, and in-depth discussions within the research team. Across all of the feedback about the app the following criteria were assessed: the description of the app, information about the developer, design and layout, navigation, interactivity, content and accessibility, security and connectivity (Taki, Campbell, Russell, Elliott, Laws & Denney-Wilson, 2015) as well as cultural responsiveness.

An online survey was created to obtain a snapshot of initial reactions to the app from māmā, whānau and health professionals. The responses to the survey also informed the questions for the individual interviews.

In-depth qualitative individual interviews about use of the app were undertaken with pregnant Māori mothers recruited via Mokopuna Ora wahakura wānanga in Midcentral, and Hapū Wānanga in Northland.

Feedback was also obtained from the Breastfeeding Friendly Hospital Initiative Coordinators. All feedback has been themed in order to provide recommendations and priorities.

Robust discussions about ethical considerations occurred alongside Māori academics and a Māori research methodologies lecturer. Due to our own rigorous and organisational expectations around tikanga for research it was agreed that registering the project as low-risk with Massey University would suffice. Ethics around confidentiality, consent and voluntary participation was maintained throughout the rangahau including the production of an information sheet, and consent forms. Based on the literature reviewed, survey and interview questions were developed and trialled.

RESULTS

The responses received from health professionals and māmā were provided with aroha and the desire to ensure that our first indigenous breastfeeding app is enhanced to provide the ultimate support to māmā in their breastfeeding journey.

Review by health professionals

Basic feedback about the app was again sought from the Breastfeeding Friendly Hospital Initiative Coordinators via their annual hui with NZBA. They provided some similar feedback to their earlier responses about how they thought the Mama Aroha curriculum could be presented in an app. However, there are some insightful differences reflecting perhaps the evolution of app technology and health professionals' use and expectation of technology.

Most BFHI Coordinators continue to have access to smartphones but report an increase in their access to other devices such as tablets, laptops and PC's, as well as an increase in access for their māmā. However, there are still some māmā who do not have access to devices and so need kanohi ki te kanohi or hardcopy information.

They agreed again that the Mama Aroha curriculum in an app form is an effective tool and gave similar justifications about the app having:

- ▶ *"Beautiful pictures, clear and easy to read, not too many words".*
- ▶ *"I use it every day at work. I open it up on my phone when I'm with mama. I share with mama that the app can talk to you when you have latched baby on (audio to text function), which they get really excited about. I also talk to dad/ partners about it."*

They also identified the same type of resources that they prefer to leave with māmā/ whānau with the addition of the Mama Aroha app in place of the Talkcards.

There was a significant increase in the BFHI Coordinators agreement that all functionalities (text to audio, record yourself, self-assessment, and interactive diary/journal) were helpful in the learning experience.

There were also some new suggestions to add information about breastfeeding multiples, effective communication with their partner and whānau about how the māmā is feeling as well as to promote the app on television, Māori media, radio, in the Wellchild/ Tamariki Ora book, and in training for midwives.

A group of 12 doctors (GPs) specialising in infant and maternal health across New Zealand also reviewed the Mama Aroha app and provided detailed feedback about structure and content. While excited by the addition of the Mama Aroha App as a means of providing important information to mothers and infants of Aotearoa as well as those caring for them, the group identified opportunities for improvement that would motivate them to recommend the use of this app through the New Zealand medical community.

The GPs' agreed that the app is very well-presented. They identified that: "the lovely artwork, photography and good graphics are clear. The style is informative with concise "bites" of information appropriate for busy parents looking for quick information and guidance." They identified that the app does not appear to work well on an iPad or tablet and appears more suited to a phone.

RESULTS

The GP's recommended that every section should have a link to where to get help and a direct link to the NZLCA website section "how to find a lactation consultant". They suggested that a detailed list of resources (local NZ ones and internationally recognised websites) for reputable help could be presented as a separate section at the end of the app. Regarding structure, they identified that the list of topics is comprehensive but could be improved.

The GP's felt that as the app is directed to both the consumer and healthcare professional that it needs to be as accurate as possible in all the information. They expressed concern that providing differential diagnoses for symptoms can be dangerous for women to self-diagnose rather than seek help. Therefore, many of their following suggestions come from the perspective of providing guidance for women to recognise what is normal and to also recognise what is not – commonly referred to as red flags – and to know when and where to seek the help they need.

Another concern raised about the app was that every word provided needs to be considered as to whether this is evidence based or just the belief commonly held. They emphasised that statements made need to be able to be backed up by references if requested or if commonly held beliefs that should be stated clearly e.g., "it is commonly believed that ..."

The GP's provided the following feedback on different sections:

Family Support if included under antenatal needs to be specific about telling the family members you plan to breastfeed and seeking whānau support, stories, and encouragement.

Under Labour and Birth – consider moving the syntocinon section to under IV fluids and include a bit of explanation of the role of syntocinon i.e., "used to increase the progression of labour" might be good.

Breastfeeding is Important for Baby (and Mother)

Consider a change of wording "when" solids are introduced rather than "until". Add the maternal benefits as well as infant benefits as the focus seems to always be on the infant. Under exclusive breastfeeding better wording might be "may protect your baby from..." as some of these claims e.g. eczema are not well supported by the literature (see Lancet <https://www.thelancet.com/series/breastfeeding>). Another recently published article in 2021 regarding benefits for baby may be of use <https://www.mdpi.com/2072-6643/13/8/2825>.

A recent 2021 study on milk components may also be good to integrate including the microbiome and stem cells: <https://www.mdpi.com/2072-6643/13/9/3094>

For maternal benefit's consider adding: decreased risk and delayed onset of type 2 Diabetes Mellitus, decreased iron deficient anaemia, and that the greatest protection from BF happens with a longer duration and total time a mother breastfeeds.

Move the detailed discussion about formula to the postnatal section as it is against the Code of marketing breastmilk substitutes to get into specific recommendation of formula before birth unless the mother has specific medical reasons why she cannot breastfeed.

The phrase "The risks of not breastfeeding" may not be the best title for this section. There could be a pop out from the "benefits for baby" that outlines the differences between formula and breast milk. It is important to give mothers good information about formula and bottle feeding – risks of bottle feeding regardless of the contents, safety in preparation, paced bottle feeding techniques and the genuine need to supplement when donor breast milk is not available. The fact needs to be communicated that even if you have been advised to supplement with formula any breastfeeding is still of value to the mother and baby and that formula

RESULTS

use can sometimes be avoided by good lactation support. Correct use of bottles and formula feeding can be critical in times of emergency such as natural disasters.

Labour and Birth

Under IV fluids need to include the technique of reverse pressure softening for breast edema and that IV fluid over 200ml can inflate the baby's birth weight see <http://www.nancymohrbacher.com/articles/2011/10/31/newborn-weight-loss-and-iv-fluids-in-labor.html>. Analgesia pethidine is almost never used in NZ now the preferred medications are tramadol, morphine and NSAIDs.

Under caesarean section maybe include some strategies to remedy the impact of caesarean section such as skin to skin, delayed bathing and early lactation support. Need to identify whether the effect of epidural can last up to three days on the baby and or the mother and provide a reference.

Traumatic /instrumental Birth – facial nerve damage/palsy is a rare event. When the infant feeding is affected by an instrumental birth the evidence is not clear whether it is the instrument or the clinical situation that required the intervention that has caused the infant to be affected. The infant may experience bruising or pain through instrumental delivery, which can affect the feeding, not just fatigue, and poor latching as this may cause painful feeding as well. Body work is non-funded and needs to be carefully recommended as it can put financial stress on new parents with breastfeeding problems.

The First Week is such a big topic it deserves a spot of its own, as most breastfeeding problems which can lead to premature cessation of exclusive breastfeeding are manifest during this time – mastitis, sore or damaged nipples, delayed secretory activation (previously called lactogenesis 2) or other medical conditions impacting on

breastfeeding. Colostrum to mature milk is also best under the first week – what is normal should be very clear. It is key that the where to get help link be clearly visible so that the mother will recognise what is NOT normal after reading this section and act accordingly.

On the third day it could advise to seek lactation help if baby is not latching. The link to "within the First week" is similar to the information of "The Third day" – perhaps it should discuss engorgement /lymphatic breast massage/mastitis/etc.). Suggest adding a link to Maya Bolman's well recognised video re breast massage <https://vimeo.com/65196007> as a great self-help for breast discomfort and to avoid the rough and damaging squeezing.

Fundamentals

This section is a great idea and needs to be kept factual. The wording is quite important as we need to keep information clear and free of any negative descriptors or specific diagnoses.

Letdown

Suggest changing the wording from "Things that stop a letdown" to "Things that may affect letdown".

Supply and Demand

The phrase "Use it or Lose it" may not be helpful and may engender unnecessary fear as many mothers are already petrified of "losing" their capacity to make milk. We need to communicate milk production increases as milk is consumed and that there is an inherent control system in place. Change title from "Use it or lose it" to "Feed on demand".

RESULTS

Feeding

Under feeding cues it is important to acknowledge that all babies are different and offering a breastfeed "early if you think your baby may be hungry" is perfectly fine.

It also may be appropriate to comment on milk as chrononutrition here as well. This information is key in understanding how breastfed babies are developing a circadian rhythm from exclusive breastfeeding (See In Circadian Variation in Human Milk Composition, a Systematic Review Italianer MF et al Nutrients 2020, 12(8), 2328; <https://doi.org/10.3390/nu12082328>)

High/Low Fat

One member has suggested to rework the "lower fat" and "higher fat" concepts so as not to promote the foremilk/hindmilk obsession. Suggest wording the milk as creamier, low volume, highly rich milk verse the carbohydrate rich higher volume milk.

The concept of "sugary" has implication for women to avoid this milk and restrict time at a second breast to avoid the high sugar milk. These concepts have to be presented carefully as milk is milk and carbohydrate intake is essential for brain function and learning in the young child. We do not have to engineer our milk to suit the baby's needs.

Breastmilk Storage

The guidelines presented are extremely conservative (see Academy of Breastfeeding Medicine for a clear statement on the guidelines). May be best to state freezing can cause some nutritional degradation and best to use unfrozen milk where possible.

Good Latch

The reference to flanged lips as a requirement to a good latch has been disproven by Dr Nikki Mills' in MRI studies of breastfeeding mothers and infants. It is suggested to remove this or any reference to lip posture. Also "clicking" should be removed as it is not

backed up by research as being a sign of a poor latch.

It is now generally accepted that the "laid back" position, which is the traditional position by which infants were fed for hundreds of years before our pillow obsession, is challenging to teach but a highly effective way to relieve many painful breastfeeding situations. This deserves a bit more emphasis and perhaps a reference video to show the multiple ways to achieve this position demonstrated such as <http://www.nancymohrbacher.com/articles/2010/10/11/some-ins-and-outs-of-laid-back-breastfeeding.html>.

Signs of a good latch see comments on flanged lips. It is not helpful for mothers to be checking lips, latching and de-latching, when we know that swallowing (audible and visible) and comfort are the key parameters. Please make this clear.

NB The nose being blocked is not a sign of a not so good latch but can be limiting the infant to latch well if the baby is having any trouble breathing.

Signs of a Good Feed

It is appropriate to explain the parameter of output i.e., the acceptable number of wet nappies and dirty nappies rather than "to watch output". "Appropriate" (may be better worded "Acceptable") weight gain (many babies will gain more than this or marginally less and still be thriving). Explained by WHO's study of over 9000 infants, cross ethnicities (the data that our growth charts are based on) as 20-30g/day.

Here would be a good place to put the discussion on supplementing/ formula/ paced bottle feeding. Instead of "what are my feeding options" consider this tab being titled "how does World Health rank infant feeding options?"

The layout of the **Post Natal Depression** section needs reworking. A better title might be Postnatal

RESULTS

Mental Health or Postnatal Mood Disorders and include the common postnatal blues, the less common depression/anxiety/Obsessive Compulsive Disorder and the rare but extremely serious postpartum psychosis in an orderly fashion. The current lay out is confusing and not helpful to have the subtitle "postpartum depression" appearing in the middle of the page. It appears that "coping strategies" are what is recommended for Post Partum Psychosis where it is in fact a psychiatric emergency which demands urgent medical assessment. The coping strategies that follow the description of postpartum psychosis are best for Baby Blues. For completeness there should be information on anxiety and OCD in the postpartum woman. Suggest contacting PADA for their help on this very important topic.

Sleep

We need to be careful how we present this topic. There is so much poor information available online and we would suggest you have a look at <https://www.basisonline.org.uk/> under the parent section and the health professional sections for guidance.

The table about how much sleep is enough should be deleted in our view as it may engender unnecessary anxiety. These are average values and many infants will not show these patterns. Many mothers believe falsely that by giving bottles at night or dream feeds you will "achieve" longer sleep times for their baby which is not backed up by evidence. Giving bottles at night can provide relief for mother but does not lengthen sleep periods (Zhang et al, 2015 and Montgomery-Downs et al 2010).

The scale diagram on parenting style seems out of place and unhelpful. A better concept may be "Value-based Parenting" questions like: "what values are important to you in raising your baby? What do you want your baby to feel and remember about your parenting? What actions will support parenting by these values?"

The comment on 2/3 babies might be better in the first paragraph or two.

Alcohol

Could reword it so that alcohol is removed from your milk over time as the blood alcohol level falls. A standard rule is one standard drink (which could be simplified by the diagram below) takes one hour to clear. If the mother is too intoxicated to care for the baby she should not be breastfeeding at that time.

The advice to not sleep with your baby if you are affected by alcohol should also include the person sharing the bed with you (unsafe co-sleeping includes partners who have consumed alcohol or drugs). Tolerance to alcohol does not affect the rate of metabolism of alcohol as blood levels will be the same.

Consider changing the pop up to "expressing ahead is a good idea in case you drink more than you planned or you feel affected by the amount you have consumed".

Smoking

Suggest replacing "You do not need to stop breastfeeding" by "continue to breastfeed".

Responses from other health professionals about their experience using the app was sought through an online survey. More indepth kōrero was sought from Māori mothers to privilege their feedback about the usefulness of the app for māmā and whānau.





ONLINE SURVEY SNAPSHOT

Our research assistant Gayle created a social media presence to promote the app and project <https://www.facebook.com/profile.php?id=100086295824092>. Promotion included scheduled posts about the Mama aroha resources, app, research team members, and research project before promoting the Qualtrics survey.

While the online survey received a modest number of responses (31), it did promote awareness about breastfeeding and the app. We also received useful responses to the social media posts about previous issues to do with the Mama Aroha website and hardcopy resources which we shared with the content creator and owner Amy Wray and supported her to resolve. For example the breastfeeding storage guidelines were updated. Eleven surveys have not been included in the findings as they were less than thirteen percent completed. A total of 20 surveys are presented here.

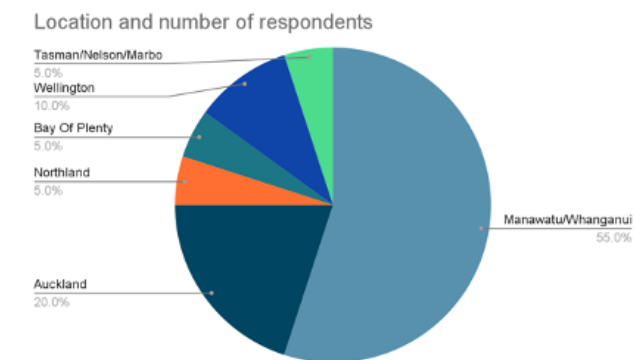


Figure 3 QR code for Qualtrics survey about the Mama Aroha App

Participants

The average age of the respondents of the surveys completed is around 37 years old and ¼ of participants from the survey identified as Māori. There was a mixture of iwi/hapū affiliations and while participants came from across the country, most were located in Manawatu/Wanganui (11).

“App is fantastic when I support māmā and whānau. Tends to answer all the common questions. Most of my clients download the app.”



Promotion

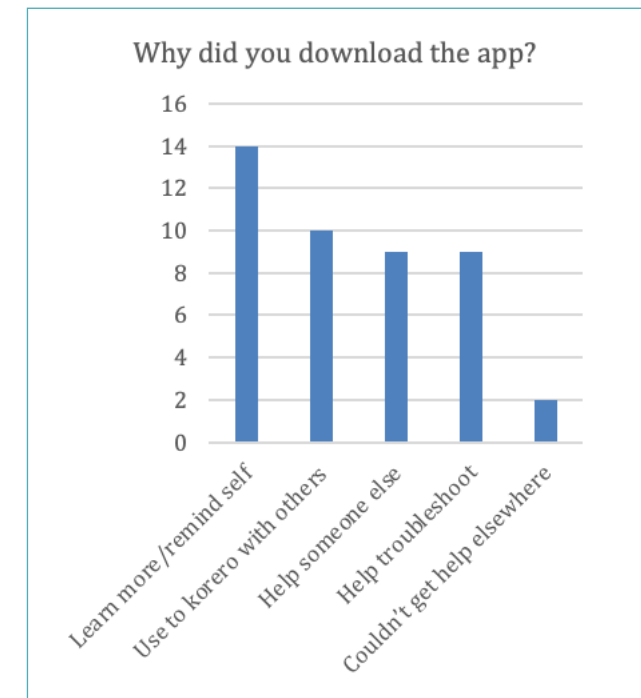
The majority of the participants had heard of the Mama Aroha app via health professionals (14), social media (8), whānau/friends (7), & pregnancy or parenting class (7) which demonstrates that a social media presence and sharing information within whānau are valuable health promotion avenues, alongside the more traditional paid health professionals and funded antenatal classes. Other places that promoted the app included hapū wānanga/ hine koopu, wahakura wānanga, wānanga hapū ora, and Whānau Awhina Plunket. Some also made comment that they also had access to the physical copy of the Mama Aroha cards and were likely health professionals.

Reason for downloading app

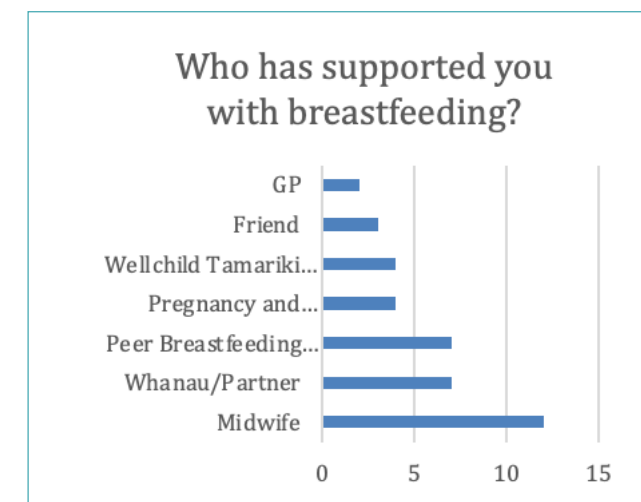
A large proportion of the respondents downloaded the app for their own use – both to learn more and/or remind self around breastfeeding. This was closely followed by others stating that they had downloaded the app due to difficulties breastfeeding, and to help others. Importantly, two participants downloaded the app due to not being able to get support elsewhere emphasising a need for additional avenues of providing appropriate breastfeeding support for whānau who may not be engaged in other services.

Participants advised that they downloaded the app before they, or a whānau member, started breastfeeding indicating it is important to promote the app to whānau during pregnancy. The information was interesting for first time māmā particularly about the background science of how breastfeeding works and what to expect, let down, the first week, breastfeeding positions, and reassurance in the first week of breastfeeding. Health professionals wanted to see what

whānau were reading to ensure consistency in conversations and in order to use the app as a resource when giving breastfeeding support.

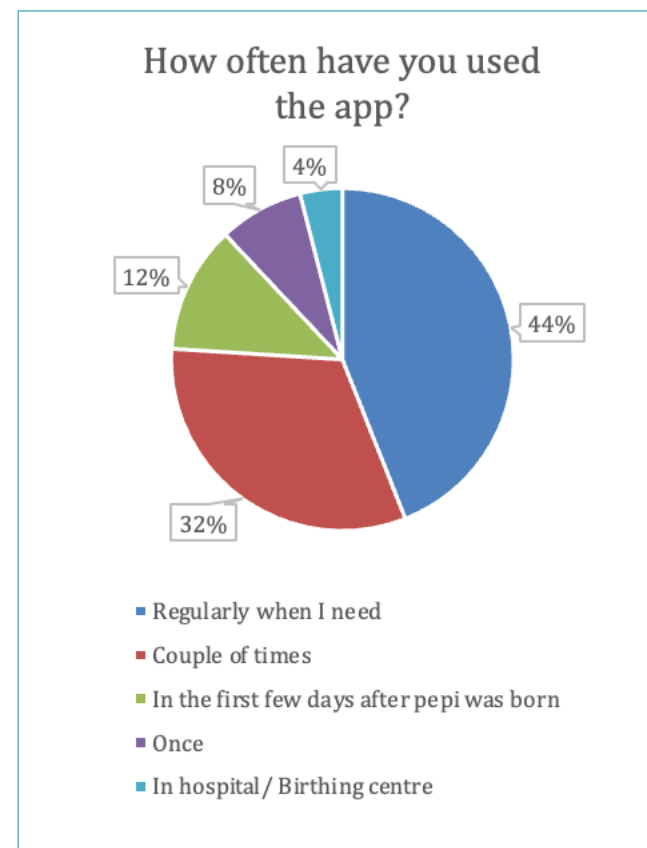


Respondents also received breastfeeding support from others – mostly midwives, whānau/partner and peer breastfeeding counsellors.



ONLINE SURVEY SNAPSHOT

The areas of support that were sought included how to massage your breast prior to feeding, how to hold a smaller pēpi, hand to grip when holding your breast to feed, using the fontanelle to help determine dehydration, peer support and awahi. These indicate a need for some of these topics to be included in the app and for support for peer breastfeeding counsellors to use the app.



Visual, text & navigation

The majority of the participants enjoyed the artwork, images, text and navigation of the app.



OVERVIEW
Can't read on your device? Use the pinch-to-zoom gesture to zoom in on this image.

THE MAIN MENU

- THE MENU**
Opens and closes the main menu. Here you turn on auto-play, record yourself and access the settings.
- RECORD YOURSELF**
You can record yourself reading each page and replace the narration. To hear your audio, turn on the "My Narration" button.
- INFORMATION**
View the legale and credits, these help tutorials and support.

NAVIGATION

- TO TURN THE PAGE**
Swipe left or right where there is no text.
- TO SCROLL UP OR DOWN**
Swipe up or down where there is no text.
- SWIPE TO READ**
Swipe paragraphs or sentences to listen to the narration.

FEATURES

- CONTENTS LISTING**
With the menu open, you can tap a page name within the contents listing to jump to that page. When you have selected the page, close the main menu by tapping the menu button.
- RESET YOUR PEPEHA INFORMATION**
With the app menu open, tap on the information button (i). Select "Reset personal information" and OK. This will reset all the input fields within the app including images.
- SEND SUPPORT EMAIL**
With the app menu open, tap on the information button. Select "Support" and send an email, or you can just email support@kivadigital.com.

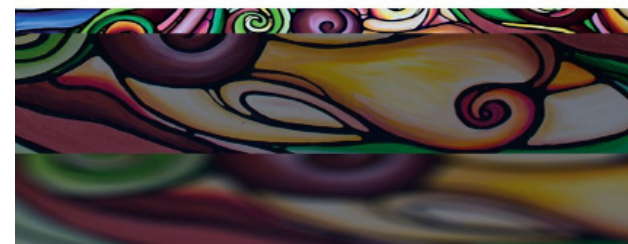


Figure 4 Example of images, text, & navigation

ONLINE SURVEY SNAPSHOT

None of the respondents knew about the My narration tool (to record your own voice) and about two thirds (66%) of the participants said they did not use, or they did not know about the text to speech function. One said there were too many words to listen to and the audio was too loud.

"I was seeking help one morning after my pepi was born and the voice was so loud it woke my other babies up. Every time I tried to scroll, it read out the words I was touching instead. Little bit hōhō"

Further recommendations from participants in the survey:

- Display info in an easier way eg too wordy.
- All images to be of māmā Māori.
- Add more info about milk flow and let down, breastfeeding changes as babies grows.
- Include how challenging/ hard/ emotional breastfeeding can be (especially initially).
- A timer or counter to keep track of feeding times and sides when māmā have had a feeding plan put in place to help baby gain weight.
- Te reo translation.
- Option to refer to further breastfeeding support eg local service by pressing a link to email or to speak to someone.

Most of the respondents said they would recommend the Mama Aroha app to others (84.21%) with the remaining indicating that they might.

"more promotion and awareness. it's a fantastic way to understand breastfeeding for all ages."

The survey responses expanded on the feedback from the health professionals by providing feedback about the accessibility and use of the app particularly for māmā.

KŌRERO WITH HAPŪ MĀMĀ

Two interviewers recruited and interviewed young Māori māmā about their experiences using the Mama Aroha app in their breastfeeding journey. The project's research assistant Gayle recruited and interviewed Māori māmā around the Manawatū region as well as attended and supported local breastfeeding groups and had informal kōrero with māmā about the app.

The māmā from the Manawatū region were living in Sanson, Bulls, Foxton, and Palmerston North. They range in age from 19 years - 29 years old (average age 25.4). 4 māmā identified as Māori, 1 non-Māori. Our non Māori māmā has a Māori partner and shared that she felt privileged to be immersed in Māori culture within her pregnancy, birth and parenting. These māmā were recruited by being previous participants of Mokopuna Ora wānanga, or were personal contacts of the research team. Interviews were arranged with the participants to ensure they were comfortable, accessible and safe for both the participants and interviewer. This ranged from being held at māmā' s homes (2), public libraries (1) or via zoom recording (2). One māmā was a first time māmā, and the other 4 māmā had 2+ children. Average interview was around 50 minutes. Whakawhanaungatanga started each interview before progressing into the kōrero.

Interviews were undertaken in Northland by co-researcher Tash Wharerau. The māmā from Te Tai Tokerau, were living in Whangarei up to the Far North, they range in age from 17-34 (average age 25.5) years old and some were first time māmā and some had other tamariki. All the māmā have breastfed between 10 weeks to 3 years and were still feeding. For the interviews Tash arranged to meet māmā where they felt most comfortable which included cafés (4), at the teen parent unit (3) or at their whare (3). The kōrero was short for one or two māmā but for others it went on for about one and a half hours as there were lots of other things

that come up for whānau as well as their current challenges or celebrations with tamariki. For one māmā she was having to move on again from her whānau in Northland as her aunty didn't agree with her parenting so on top for her was where her and baby would be staying that night, and if the interviewer could help her with accommodation and food. Significantly the koha she received from this project was well appreciated and enabled her to buy some things for her and son immediately. Two interviews occurred together. One interview said they had used the app but then later admitted they didn't have a phone or data to access the app so she had looked at it retrospectively and had reminded the interviewer that not all can afford a phone or have more important things to use data/ credit for. The māmā were asked to choose a manu as a pseudonym in order to protect their identity.

The responses from the māmā provide more indepth insight into their experiences, needs and aspirations about breastfeeding. Key themes and quotes are presented below.

Praise

All the māmā thought the app was pretty, would use it again and would recommend it to others. Most used the app in the first couple of weeks to establish breastfeeding, and then if there were changes to breastfeeding such as a decrease in milk supply or breastfeeding issues such as mastitis. The information about SUDI was really appreciated.

"Love that it's local. Cool as that it's the first indigenous bf support app"

"Overall the app was helpful because it felt like there was a friend there."

"I love everything about it. I feel like when you have a new baby, you're so overwhelmed and it's hard to

remember all the things. So it's really good to have the app to go back and like flick through and be like, "Oh yeah, I'm doing it right". Or "I can change this but and it might help" or just having that information available all in one spot. You don't have to like Google things."

"all of the different latching positions, the way babies are supposed to look, because with a lot of phone consults everything's hypothetical, and with the app you can actually see what it's supposed to look like in the detailed photos"

"I didnt have to see a lactation consultant - I feel the app helped in that way"

"our people need that back up for breastfeeding support - someone else to turn too because the nurses at that time were quite forceful"

"I think I used it religiously in the first few months, because it's got all the information that someone wants to know. And most of it's concise. And then, obviously, the diagrams and the pictures to assist. And it's got everything from baby to mum to transitions to positions. Yeah, everything you need to know. It's like a one stop shop, which is awesome."

Breastfeeding whakapapa and pūrākau.

Kōrero about breastfeeding within whānau has changed over time and is not always normalised which can dictate support and decision to continue breastfeeding. There is also an expectation for breastfeeding to come naturally especially for older or more experienced mothers.

"I think the expectation of how easy the milk comes in and how hard it actually can be. It's just this invisible expectation like "Okay, cool your babies

born, put them on your breasts". But it's not the reality at all."

"At first it was a huge shock like I didn't know about pain or any of that. I just thought you have a baby and you breastfeed. Your body knows what to do, you know what to do. Your baby knows what to do. But it wasn't like that. He wouldn't latch. I didn't know what I was doing."

"it was a very lonely experience, because I felt like breastfeeding wasn't really talked about. Like, you couldn't start a conversation with your friends about your breasts, everyone just got on and did it"

Education provided during pregnancy

Breastfeeding education should be provided before baby is born such as at wahakura or hapū wānanga.

"a wānanga about breastfeeding before baby is born from the beginning, including māmā that already have pēpi and have experience of weaning/mixed feeding."

"I attended wahakura wānanga where there was breastfeeding education and realised that people are out there normalising breastfeeding. They drilled into the tāne to download the app so that the māmā don't need to do everything"

KŌRERO WITH HAPŪ MĀMĀ

For Partner and whānau

Partner and whānau should be able to use the app to learn more about breastfeeding and support māmā.

"In neonates partner lived on the app. [Partner] would make suggestions from the app such as about latching, māmā wellbeing, postnatal depression, how to give māmā down time and that māmā needs to sleep when baby sleeps. He was excited."

How we make milk

Explain the physiological process of breastfeeding and the importance of loving our bodies especially for young mothers who may still be getting comfortable with their developing bodies.

"when I was young I didn't know what oxytocin was and I became scared of it - it was an uncomfortable feeling for me"

"My tinana (boobs) were really under-nourished because I wasn't loving myself properly"

"There was some hard nights before my milk came through. So I think I would have appreciated a bit more education on what to expect when your milk has yet to come through. I felt like my nipples were raw and someone was putting electrocution on my nipples every time baby needed to feed because it was like every 45mins to an hour."

"There was no problems with latching. It was more about me and positioning my body. Getting told to relax my shoulders, because I'd always be like "I can't see" and I have long arms. My pēpi was so little. I felt awkward myself trying to make him comfortable."

Healing

Breastfeeding can be healing particularly if there are challenges around desire or timing of conception, previous miscarriage/abortion, feeling judged by others, traumatic pregnancy, labour or birth, relationship issues or separation. "It was my choice to breastfeed my third as part of my healing journey, being someone who wears a moko kauae and has committed to te ao Māori."

"I'd had some education about breastfeeding and I knew it was a beautiful bond. I was determined to do whatever it took to get the flow, comfort and the connection."

Lack of information and support

Māmā spoke about a lack of support and information about breastfeeding. "I haven't accessed info from other spaces other than word of mouth and this app. I didn't know you could reach out for help in the breastfeeding space. I thought that if you can't do it, you just can't do it and you put your kid on the bottle."

"I didn't see a lactation consultant because I didn't have transport. I was 16 when I had them so I didn't drive or anything, I couldn't get to one and it seemed as if one wouldn't come to me. So I felt like a failure."

"I feel like maybe if I had more support or the knowledge from the outset then maybe breastfeeding would have carried on longer."

KŌRERO WITH HAPŪ MĀMĀ

Whakamā

Experiencing difficulties and struggling to ask for help because of whakamā/shame.

"when you feel like you can't do something, that you're supposed to do for someone, a lot of hara kicks in"

Reassurance that fed is best

Sometimes there is a need to safely provide temporary relief to mother and baby with alternatives such as donor breastmilk or formula while different strategies are tried to increase breastfeeding.

"I've had babies the same time as my aunts and when babies are hungry they're hungry so they just fed each other's babies. There wasn't a place to make that look normal for my friends and I to feed each other's babies like my aunts did."

"I wish I could have read in the app that it was ok that I couldn't produce enough milk and that it was okay to give him other sources of milk, and how to know this and signs that baby is telling you they need a top up"

Priorities

Stress, being tired, dehydrated, time pressure, especially if more than 1 child, poverty, homelessness, drugs and lack of support all impact on breastfeeding.

"I had heard about the app from my midwife and at the Teen Parent Unit but I didn't have a phone that had credit, and I didn't want to tell anybody that. I was more worried about what we were going to have for dinner because we had nowhere (stable) to live."

Intuitive

Not everyone is familiar with or prefers to use apps to access health information. "I am not an app person"

"some of the words were pretty confusing, like I have to be a nurse to understand it."

Integrate pūrākau and mātauranga

Feedback included a desire to ensure information is grounded in te ao Māori and ways of learning, and not just superficially employed.

"The pictures are Māori but not the kaupapa...I'm just wondering if you could teach using pūrākau Māori...Don't get me wrong though the actual content itself is amazing."

Recommendations to enhance the app

- Adding a welcome kōrero about supporting the breastfeeding journey from the team behind the app to make it feel more personable.
- More information about when milk comes in and cluster feeding, bonding and release of oxytocin, expressing, mixed feeding, wellbeing.
- Add testimonials from other māmā who have experienced a range of breastfeeding issues and used the app.
- Better promote the text to audio function and enable it to be disabled.
- Be able to navigate to previous pages without jumping back to homepage.
- Be able to scroll down and scroll across for further info.
- Make the app accessible offline.
- Add a tutorial on how to use the app.
- Add videos and links to other resources.
- Add a function to connect with other māmā.
- Add a link to find out about other Māori pregnancy and parenting support eg Hapū wānanga and wahakura wānanga.
- Add a chat bar in the app to answer questions.

There was another suggestion about including screened donor milk as the third option in the list of feeding options although this has already been changed.

Interviewer reflections

My heart goes out to our whānau. I felt that even though some enjoyed not having to bother people with their questions and could find breastfeeding answers themselves from the app in general they still needed kanohi ki te kanohi engagement but were too shy to ask, or didn't know where to ask for help. I enjoyed this type of kōrero, I felt that the māmā were comfortable to speak their truths, trust us with the integrity that the kōrero was given and rangatiratanga for what they would like to see for their whānau oranga.

It was sad to see that even being a māmā second time round (or more) there was still some whakamā around asking questions to help better the māmā situations, not only around breastfeeding, but around any kind of support to tautoko their whānau.



▶ LIMITATIONS

We experienced significant delays to recruiting a research assistant and data collection due in part to COVID public health restrictions and challenges undertaking face to face research activities such as recruitment and interviewing as many antenatal classes and hapū wānanga were put on hold to protect the vulnerability of this population. Our Northland Hine Koopu facilitator experienced more delays in recruiting and interviewing young Māori māmā in Northland due to the severe weather and Cyclone Gabrielle.

▶ DISCUSSION & CONCLUSION

The findings of this research confirm that the Mama Aroha curriculum and translation into the first indigenous breastfeeding app is still useful and relevant to health professionals and māmā. While the app was developed quickly in response to a demand to provide digital breastfeeding support during the public health restrictions of the COVID pandemic, the development in app technology and more recent breastfeeding evidence provided the opportunity to update and enhance the app. This research has helped to identify key considerations of an indigenous breastfeeding app.

Breastfeeding support for Māori

Healing from colonisation

Breastfeeding can assist with healing from (intergenerational) trauma that may have hindered breastfeeding and contribute to reclaiming and normalising ūkaipō - Māori mothering practices.

Strengthen whānau

The breastfeeding journey starts with the whānau. Through kōrero from the whānau a pūrākau about breastfeeding as a healing journey can be created.

Intergenerational transmission of knowledge and support for breastfeeding can help to counter the ongoing impacts of colonisation which can hinder whānau ora.

Addressing broader impacts on health and wellbeing such as poverty, homelessness, domestic violence, threat of child removal will also strengthen whānau ora.

Te ao Māori

Mātauranga and te reo are taonga. A holistic approach to health and wellbeing eg Te Whare Tapa Whā, can help to address the impacts on both māmā and pēpi eg tiredness, depression. Wānanga

DISCUSSION & CONCLUSION

enables culturally engaging ways of sharing information. Access to other breastfeeding mothers can normalise breastfeeding, enable sharing of personal experiences and provide peer support.

Culturally responsive

Māori want to see themselves reflected in the health workforce providing breastfeeding support such as Māori GPs, lactation consultants, midwives, Wellchild Tamariki Ora nurses, breastfeeding educators and peer counsellors/ champions. Culturally responsive training and resources co-designed with whānau support health professionals to effectively engage with whānau. Engaging whānau early in the development of health training and resources and integrating their whakaaro and priorities with evidence-based content provide high-quality and culturally relevant design.

Accurate, accessible and timely health information

Access to healthcare

Services that are fully funded and free of charge, and have the option of home visits reduce all barriers. If needing to attend an off-site venue away from home, there should be assistance with travel and parking, flexible appointment scheduling, the option of drop-in availability, timely service delivery, and accommodations for children or the provision of childcare. For digital services they must be cost-free, data-free and specifically designed for personal use and troubleshooting within the home and community.

Timely and in the home

Focused support in the home in the first 6 weeks helps with the difficulty in establishing breastfeeding during this critical period.

Evidence-based

The app is designed for both health professionals and whānau so the content is constantly reviewed by lactation experts. This expert review and guidance would benefit from a more formalised process such as an expert advisory group to regularly review and advise updates.

This would help with misconceptions such as insufficient milk supply, confusion about smoking while breastfeeding, uncertainty about the safety of bed sharing and changes over time. Whānau testimonials about a range of breastfeeding experiences can help whānau to relate to personal lived experience.

Digital tools

Engaging

Aesthetically pleasing with Māori imagery and Māori people. Simple language with a readability level appropriate for vulnerable populations. Innovative interactive functions that enable whānau to self-determine and track their own progress in regards to health and wellbeing such as a text to audio tool (that can be turned on/off), timer or counter to track feeding times and sides, a chatbot/ bar in the app - to answer questions and provide companionship. Navigation capabilities eg swiping and scrolling functionality.

Functional

Tutorial on how to download, use and navigate the app and its functions. Ongoing maintenance and improvements of the app.

DISCUSSION & CONCLUSION

Integrated

An app needs to be part of a package of online support such as a website, videos/podcasts and a moderated social media platform to promote the resource and receive and answer breastfeeding related enquiries, and refer onto relevant links and supports. Administered by a fully funded breastfeeding service would ensure consistency, professionalism and timeliness. Digital support also needs to be integrated into local and national breastfeeding services with links to connect to in-person support such as other breastfeeding māmā, peer support counsellors, lactation consultants via the NZLCA website section "how to find a lactation consultant", particularly if breastfeeding issues do not improve.

A detailed list of resources (local NZ ones and internationally recognised websites) for reputable help could be presented as a separate section at the end of the app.

This report also provides key recommendations to help improve the app, its use and promotion and could be transferable to inform the design of effective breastfeeding support for Māori and indigenous peoples including digital health resources.

NZBA and Hāpai te hauora have committed to helping to disseminate the findings to key stakeholders such as the Ministry of Health, the new Infant and Young Child Feeding Committee, Aotearoa Breastfeeding Alliance, SUDI prevention network and Smokefree sector. The New Zealand Breastfeeding Alliance have committed to providing clinical review to ensure the content is accurate. Hāpai te Hauora have committed to working with Kiwa digital on these improvements. Kiwa Digital has committed to making these

improvements once finalised and fully funded. The research team has committed to overseeing these changes and securing more funding to implement all the recommendations.



▶ RECOMMENDATIONS

This report recommends the following **nine actions** and enhancements to the Mama Aroha App.

Invest

Commit to the Mama Aroha app as an established culturally responsive brand and the first indigenous breastfeeding support app by providing funding to implement the recommendations to ensure the app is free, requires zero data, accurate, and interactive.

Procure

Secure technical support (from Kiwa Digital) to make suggested changes and add additional interactive functions.

Increase

Promote the app with additional online support eg a website, videos/podcasts and moderated social media accounts administered by a fully funded breastfeeding service.

Review

Establish a Kāhui Kaitiaki (steering group) to oversee the app and its regular review and update by whānau and health professionals.

Innovate

Through co-design with whānau create and test new technological advancements in app software capabilities.

Integrate

Integrate the Mama Aroha app into local and national breastfeeding support and use within training and education for health professionals and peer breastfeeding counsellors/ champions to provide support in the community and home.

Disseminate

Share the key findings of the report with key stakeholders such as the newly established Infant and Young Child Feeding Committee, Kahu Taurima, midwives, wellchild/ Tamariki ora, GP's.

Collaborate

Collaborate with other indigenous groups regarding the use of breastfeeding support apps.

Research

Continue to further research about the development and effective use of digital resources such as apps to promote health and wellbeing such as breastfeeding for Māori and indigenous peoples.





REFERENCES

Adcock, A., Cram, F. & Lawton, B. (2019). *E Hine: Young Māori Women's Journeys Through Pregnancy, Birth, and Motherhood* In Akella, D. *Socio-Cultural Influences on Teenage Pregnancy and Contemporary Prevention Measures* (pp. 1-349). Hershey, PA: IGI Global. doi:10.4018/978-1-5225-6108-8

Bennett, D., Gilchrist, C.A., Menzies, R.L., Harwood, M., Kingi, T.K., Atatoa Carr, P., Morton, S., Grant, C.C. (2022). Determinants of exclusive breastfeeding for wāhine Māori. *New Zealand Medical Journal*. 135(1555):73-87. PMID: 35728237.

Cheng, H., Tutt, A., Llewellyn, C., Size, D., Jones, J., Taki, S., Rossiter, C., Denney-Wilson, E. (2020). Content and Quality of Infant Feeding Smartphone Apps: Five-Year Update on a Systematic Search and Evaluation. *JMIR Mhealth Uhealth* 8(5):e17300 URL: <https://mhealth.jmir.org/2020/5/e17300> DOI: 10.2196/17300

Edwards H, R. I. (2014). *Ūkaipōtanga: A grounded theory on optimising breastfeeding for Māori women and their whānau*. Doctoral dissertation. Auckland: Auckland University of Technology.

Ellison-Loschmann, E. (1997). *Māori women's experiences of breastfeeding*. (Masters dissertation), Victoria University of Wellington, Wellington.

Foese, A. (2019). *Māori and Pasifika women's experiences of breastfeeding across the South Island Consumer stories: Quality Improvement Project*. https://www.babyfriendly.org.nz/fileadmin/Documents/South_Island_breastfeeding_project_5_Feb_2019.pdf

Houston, A., Laws, R., Askew, D., Saldanha, T., & Denney-Wilson, E. (2017). Exploring the cultural appropriateness and usefulness of a mHealth promotion program for infant feeding in an Urban Aboriginal Health Service: A qualitative study. *Australian Indigenous Health Bulletin*, 17(3), *Australian Indigenous Health Bulletin* 17(3).

Glover, M. & Cunningham, C. (2016). Hoki ki te ūkaipō: Reinstating Māori infant care practices to increase breastfeeding rates. In *Infant Feeding Practices: A Cross-Cultural Perspective*. Editors: Liamputtong P. 247-264. Springer, New York. Retrieved from <http://hdl.handle.net/2292/14220>

Glover, M., Manaena-Biddle, H., Waldon J. (2007). Influences that affect Māori women breastfeeding. *Breastfeeding Review*. 15(2), pp5-14.

Glover, M., Manaena-Biddle, H., Waldon J. (2007). *The Role of Whānau in Māori Women's Decisions about Breastfeeding*. *Alternative*. pp143-159.

Glover, M., Manaena-Biddle, H., Waldon J, et al. (2008). *Te Whāngai Uu-Te Reo o te Aratika: Māori women and breastfeeding*. Auckland: University of Auckland.

Glover, M., Waldon, J., Manaena-Biddle, H., Holdaway, M., Cunningham, C. (2009). Barriers to Best Outcomes in Breastfeeding for Māori: Mothers' Perceptions, Whānau Perceptions, and Services. *Journal of Human Lactation* 25(3):307-316. doi:10.1177/0890334409332436

Gosman, H. (2015). *What influences infant feeding decisions for Māori mothers aged 15-24 years? A thesis in partial fulfilment of the requirements for Master of Nursing thesis Eastern Institute of Technology: New Zealand*.

Laws, R. A., Cheng, H., Rossiter, C., Kuswara, K., Markides, B. R., Size, D., Corcoran, P., Ong, K.-L., & Denney-Wilson, E. (2023). Perinatal support for breastfeeding using mHealth: A mixed methods feasibility study of the My Baby Now app. *Maternal & Child Nutrition*, 19, e13482. <https://doi.org/10.1111/mcn.13482>

Lawton, B., Cram, F., Makowharemahihī, C., Ngata, T., Robson, B., Brown, S., & Campbell, W. (2013). Developing a kaupapa māori research project to help reduce health disparities experienced by young Māori women and their babies. *AlterNative: An International Journal of Indigenous Peoples*, 9(3), 246-261.

Lewkowitz, A. K., López, J. D., Werner, E. F., Ranney, M. L., MacOnes, G. A., Rouse, D. J., Savitz, D. A., & Cahill, A. G. (2021). Effect of a novel smartphone application on breastfeeding rates among low-income, first-time mothers intending to exclusively breastfeed: Secondary analysis of a randomized controlled trial. *Breastfeeding Medicine*, 16(1), 59- 67.

Manaena-Biddle, H., Waldon, J., & Glover, M. (2007). Influences that affect Māori women breastfeeding. *Breastfeeding Review*, 15(2), 5-14.

Manhire, K.M., Williams, S.M., Tipene-Leach, D. et al. (2018). Predictors of breastfeeding duration in a predominantly Māori population in New Zealand. *BMC Pediatr* 18, 299 <https://doi.org/10.1186/s12887-018-1274-9>

Reinfelds, M. (2015). *Kia mau, kia ū: supporting the breastfeeding journey of Māori women and their whānau in Taranaki*. Masters thesis, Massey University. https://mro.massey.ac.nz/bitstream/handle/10179/7551/O2_whole.pdf?sequence=2&isAllowed=y

Simmonds, N., & Gabel, K. (2016). Ūkaipō: Decolonisation and Māori maternities. In J. Hutchings & J. Lee-Morgan (Eds.), *Decolonisation in Aotearoa: education, research and practice* (pp. 145-157). Wellington, New Zealand : NZCER Press.

Stevenson K, Filoche S, Cram F, Lawton B. (2020). Te Hā o Whānau: A culturally responsive framework of maternity care. *The New Zealand Medical Journal* 133(1517):66-72

Taki, S., Campbell, K. J., Russell, C. G., Elliott, R., Laws, R., & Denney-Wilson, E. (2015). Infant Feeding Websites and Apps: A Systematic Assessment of Quality and Content. *Interactive journal of medical research*, 4(3), e18. <https://doi.org/10.2196/ijmr.4323>

Technical Advisory Services. (2020). *Breastfeeding support across Aotearoa: A collection of breastfeeding service interventions*. Author.

Te Huia, B. (2020). *Whāia Te Aronga-a-Hine – Ngā Māmā Report 2020*. Ngā Maia, Māori Midwives. Aotearoa. New Zealand. Published September 2020. ISBN 978-0-473- 53891-0.

Te Puawaitanga ki Ōtautahi Trust. (video). (March, 2020). Ūkaipō <https://www.youtube.com/watch?v=3aWbXArwYIY>

APPENDICES:

INFORMATION SHEET

MĀMĀ AROHA:

A digital breastfeeding resource to improve support for māmā

Nei te mihi nui ki ngā māmā e whāngai waiū ana ki ngā tamariki mokopuna, me ngā whānau e tiaki ana i ngā māmā.

Tēnā koe and thank you for agreeing to share more about your experience using the Māmā Aroha app to support your breastfeeding.

Our research team Amy Wray (app owner/content expert), Fay Selby-Law (National SUDI prevention coordination service Hāpai te Hauora), Carmen Timu-Parata (New Zealand Breastfeeding Alliance), Tash Wharerau (pregnancy and parenting educator in Northland Hine Kōopu) and Felicity Ware (Mokopuna ora wahakura wānanga in Midcentral) have collaborated with researchers from Te Putahi a Toi School of Māori Knowledge at Massey University to understand how Māori māmā and health professionals who work with them are using the app.

We aim to kōrero with 20 māmā and 10 health professionals about their experiences, what was useful and what could be improved. This will complement the responses to our brief online survey about how the app was heard about and accessed.

You have indicated that you are:

- Māori
- Have used the Māmā Aroha app to support your breastfeeding.
- And would like to share kōrero about your experiences with the app.

We will work together on a time and place for the kōrero. It will probably take around 30 minutes to 1 hour. You can have your whānau and support people join you for the kōrero if you choose.

Your kōrero will be recorded if you consent. You may at any time ask for the recording to stop and to withdraw from the research. Confidentiality will be maintained between the research team.

You will receive a small koha as an appreciation of your time and kōrero.

In the event that the kōrero triggers a response that you would like support with, we will facilitate a referral to relevant help and information.

All the information gathered for this research is private and stored securely on password protected systems to be used for these research purposes only and stored for 5 years before being safely disposed of.

If you have any questions or concerns, please contact **Dr Felicity Ware** F.J.Ware@massey.ac.nz.

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researchers involved in this project are responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz.

Interview questions

1. (If you need to warm up the kōrero) How was/is your breastfeeding journey?
2. Share with me how you used the Mama Aroha app with breastfeeding?
3. What did you find useful about it?
4. If you could improve something about the app, what would it be?
5. What part of the app would you recommend others use?

mama aroha



A digital breastfeeding resource to improve support for māmā



mama
aroha



REPORT DESIGNED & CREATED BY:

HĀPAI TE HAUORA TĀPUI LTD | 6-8 PIONEER STREET HENDERSON, AUCKLAND | WWW.HAPAI.CO.NZ