



Health Innovation
West of England

FULL REPORT

Preparing to implement a digital
breastfeeding app:

A survey of maternity staff views
and beliefs on smartphone use to
support breastfeeding

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and Genevieve Riley

January 2024

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Real-world evaluation project team

The evaluation and implementation of the Anya app is supported by staff across several organisations. Health Innovation West of England acknowledges and thanks the following members of the project team: Rhian Boase³, Rebecca Bury³, Lara Covill⁵, Emma Cronin-Preece², Kay Davis⁴, Rachel Davis⁵, Nathalie Delaney⁵, Zeisha Foord³, Kyle Gatier¹, Emilie House¹, Alex Leach⁵, Dawn Morrall⁴, Benjamin Newton⁵, Elizabeth Parkes², Genevieve Riley⁵, June Samm³, Peter Wathen⁶ and Jo Witchard³.

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Declaration of interests

Health Innovation West of England supports innovators such as Anya, to bring their innovations to the NHS. This may, where appropriate, include supporting evaluation delivery to our member organisations, and innovations we have supported.

Whilst these evaluations are independently conducted and reported, for transparency we disclose our dual role where applicable. In this report, we note the dual role of Health Innovation West of England to facilitate and evaluate Anya.

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1. Introduction

Breastfeeding is recommended by the World Health Organisation (WHO) as the exclusive source of feeding for the first six months of an infant's life (1). Moreover, WHO recommend this is initiated within the first hour of a baby's life. This is supported in a Cochrane review, which notes both mother and baby can experience substantial health benefits from exclusively breastfeeding in the first six months (2). Benefits to infants include reduced mortality, obesity and leukaemia risk, whilst benefits to mothers include increased birth spacing and reduced risk of breast and ovarian cancer (3).

Despite the well-documented benefits to both mothers and infants (4), the UK has one of the lowest breastfeeding rates worldwide. The latest annual governmental data (5) reveals the 2021-22 aggregate rate of breastfeeding in England at six to eight weeks was 49.3%.

To increase breastfeeding rates, researchers and clinicians have turned to e-health technology, including smartphone apps, to provide alternative forms of breastfeeding support (6-7). Anya^a is an example of smartphone technology and is available on Android (Google)^b and iOS (Apple)^c platforms. The app aims to provide around-the-clock breastfeeding support through the LatchAid^d module, which offers visual information on latching technique. Anya also provides access to virtual parenting groups and one-to-one support from real-life specialists.

The Gloucestershire Local Maternity & Neonatal System (LMNS) purchased 500 licences for Anya and Health Innovation West of England agreed to conduct a real-world evaluation^e as part of our commission from the Office for Life Sciences. We sought to understand the views and beliefs of maternity staff, as well as their confidence in using smartphone technology. An individual's sense of self-efficacy (8) – or how well they perceive they can do something – can positively predict whether the individual intends to recommend the adoption of mobile health services (9). Thus, gaining insight into the confidence of the maternity workforce may facilitate the successful implementation of Anya.

^a The Anya app is a parenting and breastfeeding app for smartphones. Further information can be found on their [website](#).

^b Android is a trademark of Google LLC. This independent survey does not imply affiliation or endorsement by Google LLC.

^c iOS is a trademark or registered trademark of Cisco in the U.S. and other countries and is used under license by Apple Inc.

Apple is a trademark of Apple Inc. This survey report is an independent publication and has not been authorized, sponsored, or otherwise approved by Cisco or Apple Inc.

^d Anya has previously been known as LatchAid. For consistency, some responses referring to LatchAid have been changed to Anya.

^e Real-world evaluation gathers high-quality evidence in 'real-world' settings to demonstrate the feasibility and practicalities of implementation. Guidance [here](#). The evaluation is running until 2024 and a final report will follow this. See [our website](#) for further details.

We therefore undertook a survey prior to the app being implemented in the local system, with the aim being to facilitate the successful implementation and adoption of Anya. Data from this survey was presented to project staff and LMNS staff, which facilitated the subsequent implementation of the app. This report formally presents the insights generated from the survey.

2. Aims and objectives

The survey aimed to identify insights from healthcare staff about breastfeeding support and technology that could be applied to support the implementation of Anya.

Specifically, we sought to find out:

- i) Staff views on the current provision of breastfeeding support and information.
- ii) Confidence levels of staff to use smartphone apps.
- iii) Staff perceptions about the potential benefits and challenges of using breastfeeding apps.
- iv) Staff perceptions and feelings about implementing a breastfeeding app, specifically in their routine clinical practice.

3. Methods

3.1. Survey design

An online survey was designed by researchers in the Evaluation & Insight (E&I) team at Health Innovation West of England. Feedback from pilot tests on the survey design was received from staff in Gloucestershire LMNS and integrated into the final design. The survey was compliant with regulations for GDPR and the UK Data Protection Act.

A consent statement was outlined stating that continuing with the survey indicated respondents consented to participation. A mixture of Likert scales and open-ended questions were used in the survey, which covered the following topics:

- i) Demographics.
- ii) Use of smartphone apps.
- iii) Confidence in using apps.
- iv) Ease of finding breastfeeding information.
- v) Use and availability of breastfeeding resources.
- vi) Views and feelings surrounding Anya and using it with patients.
- vii) The challenges perceived by staff surrounding using Anya.
- viii) Staff perceptions surrounding their confidence and ease of using Anya.

3.2. Sampling and participants

A non-probability sampling approach (also known as convenience sampling) was used across the LMNS workforce in Gloucestershire, which included Health Visiting, Maternity Support, Medical, Midwifery, and Neonatal divisions. The sample also included students on placement. The total maternity workforce was calculated in April 2023 and estimated to be 766 staff. Clinical Leads supporting the project facilitated the distribution of the survey across two NHS Trusts.

3.3. Data and analysis

The survey received its first response on 26 April 2023 and its last response on 16 May 2023; a period of 21 days. A total of 81 people completed the survey, giving a response rate of 11%.

There were 53 (65%) complete and 28 (34%) partial responses to the survey. All responses were included in the analysis. Responses were exported into an Excel spreadsheet. Crosstabulation reports enabled the analysis to focus specifically on sub-groups. For instance, we have been able to differentiate results between community and hospital-based staff. The initial analysis was conducted, and then second-checked by a further member of the evaluation team to provide quality assurance.

Qualitative data were analysed in dyads to agree a consistent approach to the analysis, using a thematic-based approach. In practice, this entailed a researcher initially reading through the responses and in some instances, further re-reading. In some circumstances, the researcher separated responses where an individual respondent described two or more separate issues. This enabled the separate issues to be individually coded. For example, if a respondent wrote:

"Mothers may not have compatible phones."

"Professional face to face support needed."

The two statements were separated so that distinct codes could be easily assigned to the statements. The researcher assigned codes against the respondent data to abstract it. These abstracted codes were then reviewed further and compared with each other. This enabled the researcher to group similar ideas together and separate different ideas. To facilitate the grouping of similar ideas, the researcher would increase the level of abstraction, resulting in higher order themes that encompassed similar respondent data. These higher order themes typically contained variation within the clustered data. Quotes have been used to illustrate the qualitative findings and provide evidence for the themes.

3.4. COM-B model

The results of this survey will be discussed through the lens of the COM-B model of behaviour (10), widely used to identify what needs to change for a behaviour change intervention to be effective. The three core components of this model are capability, opportunity and motivation (10). For behaviour to happen, individuals must feel capable, have the opportunity and the motivation to engage in the target behaviours.

Whilst acknowledging that there are many useful implementation models available (e.g. Normalisation Process Theory (11), PARIHS (12), NASSS (13)), the COM-B model offers a useful structure for understanding behaviours targeted for intervention. Our survey offers the opportunity to understand the following specific behaviours around implementation:

- Staff introducing Anya to pregnant women or mothers.
- Staff describing the benefits and opportunities of the Anya app to pregnant women or mothers.
- Staff demonstrating the Anya app to pregnant women or mothers.
- Staff supporting pregnant women or mothers to access the app themselves.



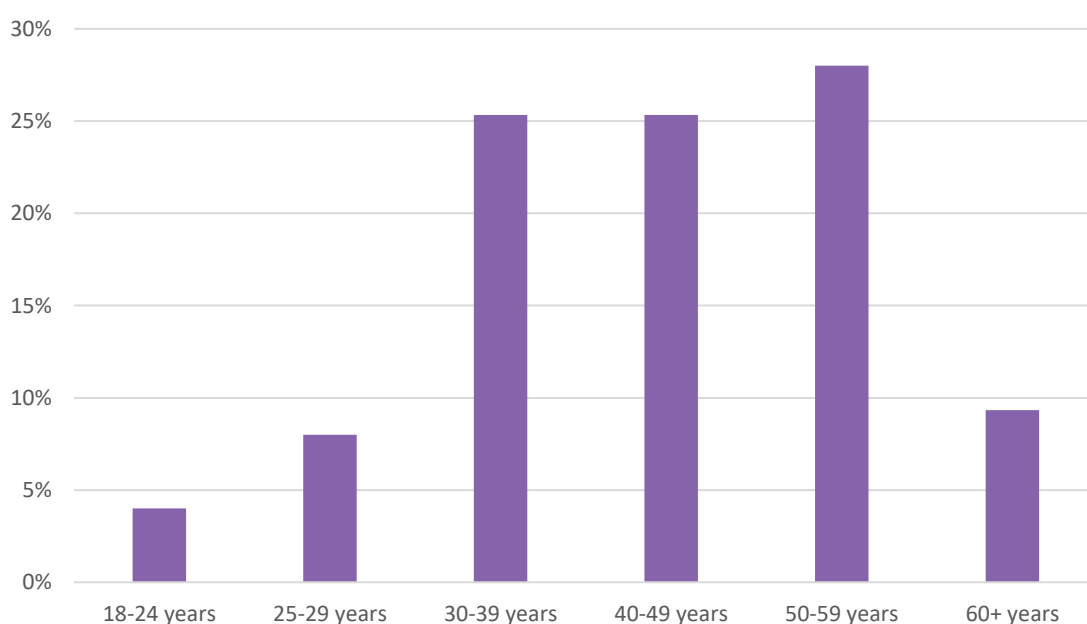
4. Findings

Here, we present the results of this survey. Where lower numbers are reported in findings, this is mostly due to the structure and routing of the questions, or where respondents chose not to answer a question. In reporting these findings, percentages are therefore calculated based on the number of people responding to the individual question, which in many cases is lower than the figure of 81 responses. As percentages are rounded up and down, there will be some instances in which figures across a table do not add up to 100%. Most tables are in [Appendix 1](#), to reduce word space.

4.1. About the respondents

Most respondents (79%, n=59) were aged between 30 and 59 years. Figure 1 shows how the age groupings were distributed across the sample. All respondents were female (total n=76).

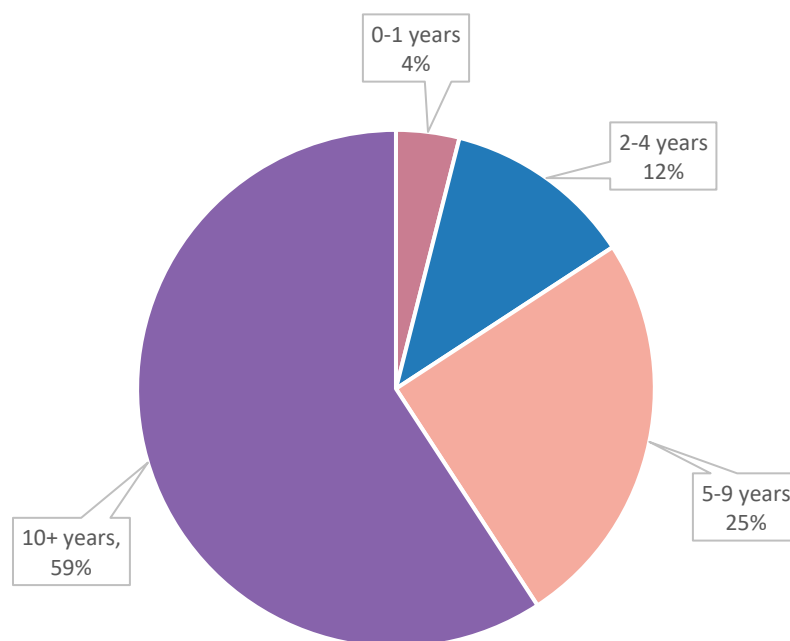
Figure 1. Distribution of respondents by age.



Of the 76 respondents who recorded their role, the most responses were received from Hospital Midwives (26%, n=20), followed by Health Visitors (16%, n=12), Community Midwives^f (12%, n=9), Hospital Maternity Support Workers (12%, n=9) and Specialist Health Visitors / Specialist Midwives (8%, n=6).

Respondents described themselves as a highly experienced cohort, with 84% (n=64) of the sample having over five years' work experience in maternity services (Figure 2).

Figure 2. Length of time respondents had worked in maternity services.



4.2. Mobile phone usage

Almost all (99%, n=74) survey respondents had used a smartphone app; whilst just under one third (28%, n=21) reported using a smartphone at home and not at work ([Table 1](#)).

Over half of respondents (57%, n=41) did not have a work mobile phone provided to them by their employer. None of the Hospital Midwives had work phones.

Of the 43% (n=31) of respondents with a work phone, the majority (71%, n=22) **would** consider using their work phone to demonstrate Anya to mothers. However, 19% (n=6) respondents would not consider using their work phone to demonstrate the Anya app. When viewed by professional role ([Table 2](#)), there was a greater proportion of Health Visitors (44%, n=4) who would **not** consider using their work phones to demonstrate the app compared with Community Midwives (11%, n=1).

^f We also received two responses from staff identifying as Continuity Midwives. Whilst this staff group work in the community, in reporting this survey we have separated their responses from those identifying as Community Midwives.

4.3. Staff confidence to use smartphone apps

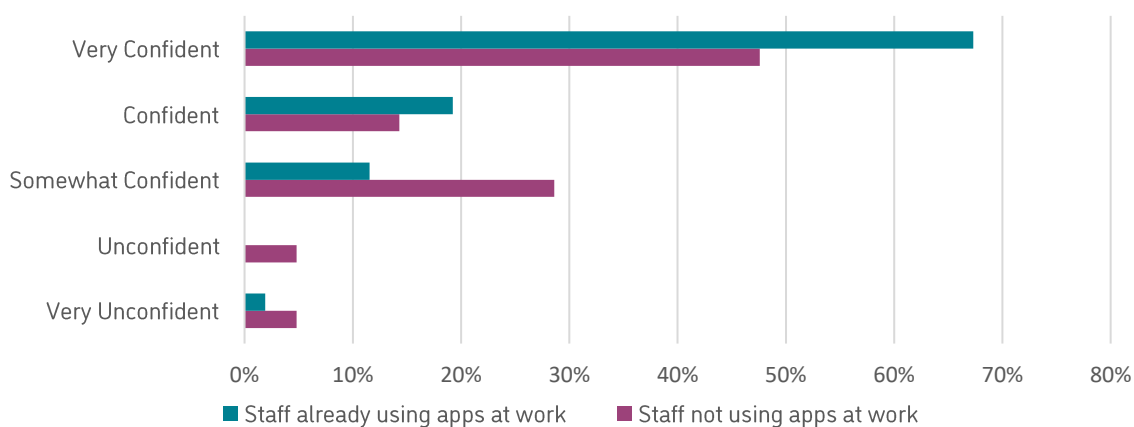
This section explores how staff rated their confidence using smartphone apps. We present qualitative data showing ideas that staff put forward to improve their confidence with apps. Moreover, we explore how staff confidence levels can vary across the type of smartphone platform.

4.3.1. Confidence using apps

Overall, the survey data suggests respondents had a high level of confidence using smartphone apps. Of those who used a smartphone at home and work, 86% (n=45) reported feeling confident or very confident in using apps at work, with just 11% (n=6) feeling somewhat confident.

There was a reduced level of confidence observed for individuals who did not use smartphone apps at work. We asked such individuals to estimate their confidence in using a smartphone app at work. A total of 62% (n=13) reported they would feel confident or very confident using an app at work, with 29% (n=6) reporting they would feel somewhat confident and 9% (n=2) reporting they would feel unconfident or very unconfident if they had to use a work smartphone app. Figure 3 contrasts the levels of confidence among respondents using and not using apps on work smartphones.

Figure 3. Contrasting confidence levels between those using smartphone apps at work and those who currently did not.



4.3.2. Improving confidence

Staff were asked to suggest ways to improve their confidence in using a smartphone app. We present some of the key suggestions that respondents offered (n=21) when they were asked "What would make you more confident using a smartphone app?"

i) Access and practice

In some clinical contexts, respondents reported they are not allowed to use phones when working with patients, potentially reducing the opportunity to develop confidence. Other respondents raised the issue of access to phones and apps; by regularly using the phone or app, staff will develop the necessary experience.

"Seeing and trying the app out first before talking to people about it."

"More easily accessible on work phone."

ii) Technical

Some staff raised issues around the ability of the app to successfully run on the phone, either because of the phone's capability to run it (at all, or too slowly) or because the Trust IT system would not allow it to run. Respondents also held concerns around the infrastructure that enables the use of the phone, whether this was the phone signal, wifi, or (poor levels of) phone battery.

"Having a phone capable of running the app and with good battery life and signal."

"The permissions for Trust devices to allow these to be used."

"Better wifi/connectivity at work."

iii) Support

Respondents reported they valued information and guidance and said it could be helpful to have app demonstrations with more experienced colleagues showing them how to use the app.

"Being shown how it works."

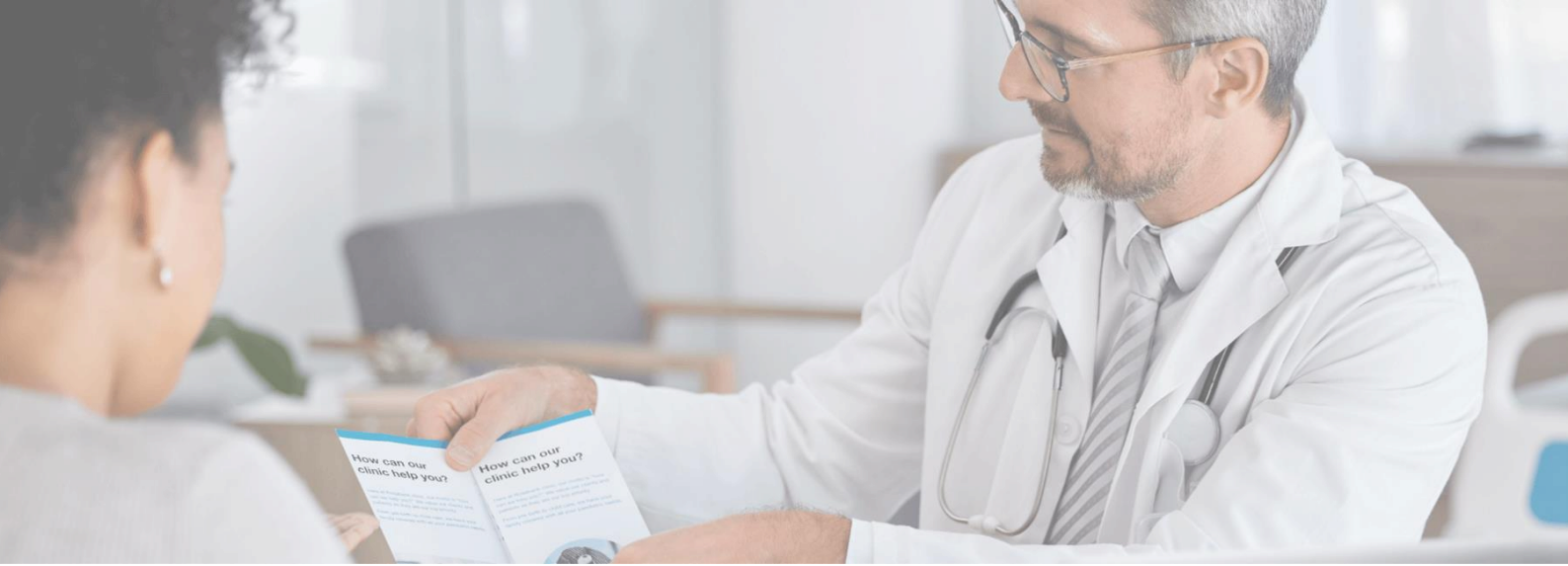
"Ease of use, clear, simple instructions."

4.3.3. Confidence across smartphone platforms: iOS vs Android

We explored staff confidence to use either Android or iOS smartphone platforms. Android is associated with Google and iOS is associated with Apple phones. Our findings around staff confidence are displayed in [Table 3](#). The results indicate small differences in confidence. However, what is notable is that markedly more staff have higher degrees of confidence using the iOS platform.

The pattern of increased confidence with iOS smartphones was replicated when staff were asked how confident they felt supporting mothers to use different phone platforms: for the Android platform, 48% (n=34) felt confident or very confident, whilst for the iOS this was 66% (n=47).

When viewed by roles, 50% (n=6) of Health Visitors felt confident or very confident using Android with mothers. This confidence was greater among Community Midwives (78%, n=7). Across the iOS platform, 67% (n=8) of Health Visitors and 78% (n=7) of Community Midwives felt confident or very confident supporting mothers. See [Table 4](#) for a full breakdown of confidence levels. Of note is that Health Visitors reported lower confidence in supporting mothers across smartphone platforms when compared with Community Midwives.



4.4. Breastfeeding information and resources

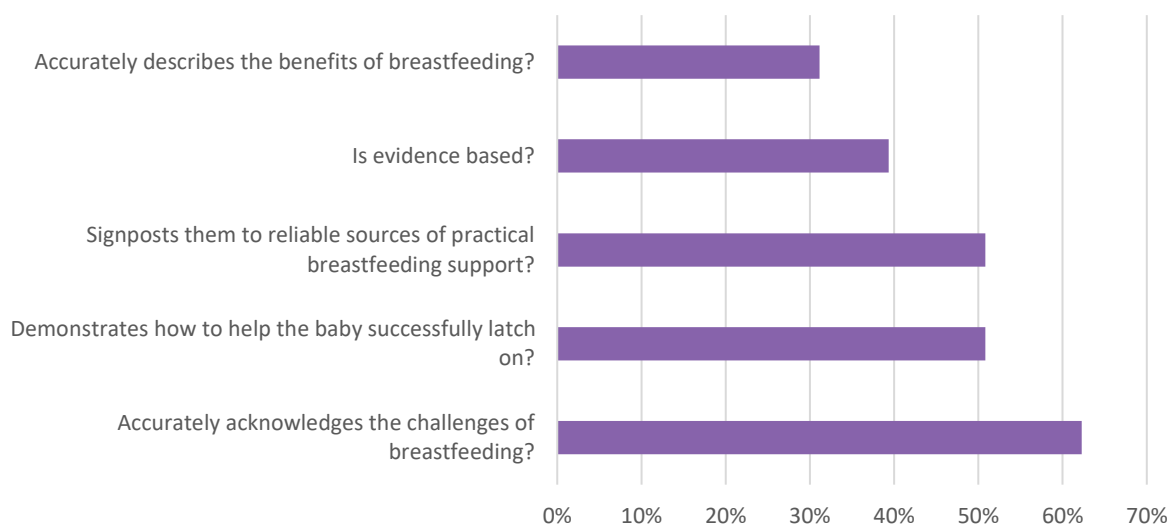
4.4.1. Estimated ease of mothers finding breastfeeding information

Staff perceptions were sought on how easy mothers find breastfeeding information that:

- Is evidence-based.
- Accurately describes the benefits of breastfeeding.
- Accurately acknowledges the challenges of breastfeeding.
- Demonstrates how to help the baby successfully latch on.
- Signposts them to reliable sources of practical breastfeeding support.

A total of 61 respondents rated these aspects, see Figure 4. The biggest difficulty staff highlighted was mothers finding information that accurately acknowledges the challenges of breastfeeding, with 62% (n=38) rating this as not at all easy or somewhat easy. The next biggest difficulty staff reported was demonstrating how to help the baby successfully latch on and signposting to reliable sources of practical breastfeeding support. These two challenges were selected by just over half of staff in each case (51%, n=31).

Figure 4. Percentage of respondents stating it is 'not at all easy' or 'somewhat easy' to find breastfeeding information with specific attributes.



4.4.2. Available breastfeeding resources

We sought to understand the resources that staff used to facilitate breastfeeding, alongside staff views on what resources were missing. A total of 44 respondents provided 122 items and these are shown in [Table 5](#). These items have been categorised into similar clusters.

The results show a diverse range of breastfeeding resources were used by staff. The most commonly used were World Health Organisation-based resources such as the Baby Friendly Initiative, National NHS resources such as information on the NHS website, Gloucestershire Breastfeeding Supporters' Network (GBSN) and the Breastfeeding Network or National Breastfeeding Helpline.

4.4.3. Missing breastfeeding resources

Staff were asked to respond to the question "What breastfeeding support / resources for mothers are missing?" 37 respondents provided responses; of these, two respondents responded to say they were unsure. The responses were analysed, and the following themes developed:

- i) Lack of professional support.
- ii) The right information.
- iii) Visual and video support.
- iv) App-based support.
- v) Round-the-clock support.
- vi) Group-based support.

i) Lack of professional support

This theme refers to the lack of workforce capacity in local services. A substantial number of respondents (n=14) provided responses to this theme, suggesting its significance.

Respondents highlighted the lack of support within both hospital and community settings. Respondents expressed there were time-limits to their capacity, reflecting an inability to spend enough time with women, supporting them to breastfeed. Of particular concern was the lack of support in the community compared with the hospital setting.

"Community has a huge short fall of feeding support specialists."

"More capacity to do more home visits or longer visits to support with breastfeeding issues"

ii) The right information

Nine respondents contributed to the theme, *the right information*. This theme can be defined as the provision of timely, accurate or responsive guidance. For some respondents, it was important that mothers were able to access information that showed them what was normal, which included being reassured. Other respondents highlighted the need for access to very specific breastfeeding queries. Some respondents emphasised the need for accurate, evidence-based information.

"Accurate/reliable/evidence-based information rather than opinion/social media etc"

"Honesty about some issues being normal."

"How much to give baby if giving top ups at home"

iii) Visual and video support

The theme *visual and video support* refers to the lack of provision of information through pictures or videos that can guide breastfeeding. Data from nine respondents contributed to this theme. Some respondents suggested visual media should be made easily accessible. Visual media can demonstrate to women how to hold the baby in various positions. One respondent suggested videos were superior to pictures because the pictures do not convey the difficulties that can arise in breastfeeding. Another suggested lactation consultants produce excellent videos.

"Pictorial /video aids easily accessible"

"Easily accessible videos of how to hold a REAL baby (newborn) in different breastfeeding positions. Videos of a real newborn latching in different positions"

iv) App-based support.

Five respondents stated they believed an app was missing to support women. This formed the theme *app-based support*. One person highlighted that Anya was only available to iOS users, another person suggested women could do with an app where all the information was contained in one place.

"Live apps"

"An app that has all the info contained in one setting!"

v) Round-the-clock support

Data from five respondents formed this theme, which describes the need for rapid provision of support, at all hours of the day. Respondents highlighted the need for support in the early hours of the morning. Two respondents highlighted the need for mothers to be seen quickly.

"Immediate access to speak with someone at home out of office hours when they are at the end of their tether and sleep deprived."

"Support at 3 in the morning"

vi) Group-based support

Finally, three respondents suggested that peer-based support groups were missing, forming the theme *group-based support*. Comments referred to in-person groups rather than virtual.

"Need more physical groups"

4.5. Potential benefits of Anya

Respondents were asked how they thought the Anya breastfeeding app might benefit pregnant women, those who have recently given birth, and professionals supporting the mother and baby. Between 41 and 44 responses were received for each of these aspects. Most respondents responded with similar ideas across the three groups. Specifically, three common themes were identified:

1. Most respondents recognised the app's **24/7 availability** as a significant advantage, highlighting the importance of information and support being accessible to mothers when they need it most. The unrestricted access was deemed particularly beneficial during moments of uncertainty and possible urgency (e.g. during the night). Respondents highlighted the app could act as a companion to the support provided by professionals.

2. The **user-friendly** nature of the app was also highlighted as another advantage when mothers are in a vulnerable state and need quick access to information. A straightforward app interface was noted as very important for women to be able to access breastfeeding information easily.
3. Lastly, the **empowering** nature of the breastfeeding app was identified. The app could play a valuable role in boosting women's confidence, therefore encouraging mothers to continue with breastfeeding.

4.5.1. Benefits to pregnant women (n=44)

One of the prominent themes that data support is the benefit to pregnant women of having easily accessible information 24 hours a day. Respondents expressed the need for the breastfeeding app to offer real-time assistance, information, and signposting guidance.

"Available 24/7/365 can be updated with current/new evidence guidelines ensuring safety and best practice, reduce conflicting advice from multiple sources"

"Easily accessible especially out of hours when can't directly contact other sources for help"

Respondents described the need for women to be prepared for the expectations and challenges of breastfeeding.

"A realistic idea of how often babies breast feed and the bf journey ups and downs in the first week."

Many respondents suggested real-life examples of women on their breastfeeding journeys may be beneficial and it would be helpful to have realistic expectations in preparing for breastfeeding.

"Setting expectations, answering questions, giving real life examples - of how easy or how difficult others have found breastfeeding"

"Preparation is key and knowing what to expect makes the journey easier and lessens anxieties both before and during the breastfeeding journey"

4.5.2. Benefits for new mothers (n=43)

A repeated theme that emerged when looking at how the app could benefit new mothers, was the app being accessible 24 hours a day. Respondents noted the app could provide continuous support in one place, in addition to support provided by midwives:

"Easily accessible especially out of hours when can't directly contact other sources for help"

"...a helpful adjunct to midwifery support"

Another key theme that emerged was having a user-friendly design and good functionality. This would allow for effortless interaction and good quality video and media support:

"Needs to have good videos of correct attachment as I think this is the most important support online information."

"Hopefully an easily accessible resource"

"Needs to be easy to get into what they need"

Many respondents highlighted the importance of empowering new mothers to feel confident to start breastfeeding:

"Increase likelihood of breastfeeding"
"Give them confidence"

4.5.3. Benefits to professionals (n=41)

One of the main themes that emerged when looking at the benefits to professionals was the availability of information in one place. This could support a one-to-one discussion with mothers and direct them to one resource where all the information is located:

"Quick links to send when unable to spend as much time on BF support as you'd want to"
"Gives something for us to guide mothers to, gives the same information to everyone"

Empowering women to feel confident when they start breastfeeding was of high importance to those who answered the survey:

"Helping empower women to BF/continue BF on trickier times"
"Increased confidence in breastfeeding"

The app's ability to deliver video and media content of high quality was noted as an important idea when looking at how the breastfeeding app could support professionals:

"Provide visual reassurance via images/avatars"
"Needs to have good videos of correct attachment as I think this is the most important support online information"

Figure 5. Summary box highlighting key benefits of a breastfeeding app.

- ✓ Three potential benefits of the breastfeeding app were identified:
 - 24/7 availability.
 - User-friendly nature of the app.
 - Empowering nature of the app.
- ✓ Themes centred on encouraging and facilitating women to **access information** and thereby **boosting confidence** of women to breastfeed.
- ✓ Core themes find common ground around mechanisms that increase women's self-efficacy to breastfeed. The breastfeeding app could facilitate women's confidence, motivation, and belief in their ability to manage breastfeeding challenges.



4.6. Potential challenges of Anya

In this section, we report on perceptions of challenges that may arise from introducing Anya. Respondents had the opportunity to identify solutions to these challenges and their suggestions are described here.

4.6.1. Potential challenges of introducing Anya

Respondents were asked about the potential challenges of introducing Anya to new mothers and were given nine options they could select from. Over half of respondents (53%, n=27) selected the statement "I am wary of introducing a commercial app". Almost half of respondents (43%, n=22) selected the challenge of not having good internet coverage in the community and an equal amount identified the issue of forgetting to introduce the app ([Table 6](#)).

15 respondents selected the 'other' option, with 14 respondents recording additional challenges. These concerns can be broken down into the following categories:

i) Accessibility

There were two concerns about the barriers of language, one concern about the cost of subscription and another about the expectation mothers would have access to a smartphone. One person felt mothers may experience the feeling there are too many apps to use, another person expressed that mothers should still receive support if they did not use the app. There was one concern about the lack of time mothers have. These concerns can be grouped into the category 'accessibility' because they pertain to the challenges mothers may encounter in using the app.

"Will potentially have to be in several languages!"

"Reliant on parents having phones etc."

ii) Infrastructure

There were three concerns that centred on the infrastructure for staff. One person was concerned about the internet coverage in hospital and two people were concerned about the poor performance of their work phones.

"My work phone is not good enough to use for this."

"Poor internet coverage in hospital."

iii) Wariness

Three respondents expressed a cautiousness or scepticism of the Anya app. One respondent said they did not want it to replace the workforce, whilst another was concerned it might reduce the time respondents spend discussing breastfeeding.

*"Unsure of a AI marketing app."
"For it not to replace people resources."*

iv) Other responses

One respondent did not think there would be any challenges, whilst another was concerned about the extent of staff's digital literacy.

4.6.2. Potential solutions to challenges

Respondents were asked in the survey to describe how the challenges around introducing Anya to mothers might be overcome. 30 respondents provided suggestions.

To analyse this section, the answers that respondents identified in the previous question about the challenges were matched with the potential solutions put forward. Not all solutions were coherent matches to challenges. To further help the reader understand this analytical challenge, an example has been put forward in Table 7 below. Here, respondent 3 selected the challenge of "internet coverage" and this logically matches with the proposed solution of "better NHS wifi". However, they also selected the challenge of "may forget to introduce the app" and the solution they wrote obviously does not correspond to this. This has therefore required a degree of interpretation to make sense of which solution matches which challenge.

Table 7. Table illustrating the interpretation involved in matching challenges with solutions.

ID	Challenge	Solution
3	I don't have good internet coverage in the community	Better NHS wifi or staff NHS wifi
3	I may forget to introduce the app	Better NHS wifi or staff NHS wifi

It is important to note that there was a paucity of data in this section and therefore the categories of suggested solutions are not as developed as they could be. However, they do offer some initial ideas from staff on the ground regarding how to address staff concerns. We present the proposed solutions below:

i) Information and transparency

This formed the largest category with nine respondents, who suggested information should come in a number of formats, such as presentations, posters and email formats. This was in response to varied challenges, including internet coverage, risk of forgetting to introduce the app and wariness of commercial apps.

"Having info we can email over when in clinic, so they can find the app themselves (where I work mobile coverage is very poor)."

Four respondents raised issues of transparency, primarily to the challenge of being wary of introducing a commercial app. These issues could be addressed by offering further information on funding sources, charges to users, the motivation behind setting up the app and how evidence-based the app is.

"Training and information provision and reassurance that the information is evidence based and not commercially funded."

ii) Infrastructure

Six respondents offered suggestions that could be conceived as pertaining to infrastructure considerations. These addressed a wide range of challenges. Two suggestions were around improving the phones that staff use, one was around improving NHS wifi. One suggestion, in response to concerns about app accessibility, was to have an app set up on an IT system in the reception area. Two suggestions were around the organisation of the app. For instance, to avoid staff forgetting, having prompts to remind staff or someone designated per shift to take the lead.

"Having someone designated per shift to do this."

"New phones/ iphones."

iii) Support or training

Five individuals raised the need to have further support or training, primarily in response to feeling uncertain in introducing the app or lacking confidence in using the app. Three respondents suggested training sessions, one respondent suggested "support" and another suggested having time to practice using the app.

"Using the App first so I know how to navigate round what it offers for the mum before I talk about it."

"Training sessions for staff."

iv) Antenatal introduction

Three respondents described the idea of introducing the app before mothers gave birth. This was in response to challenges around time and remembering to introduce the app.

"Should be introduced as part of their AN education."

v) App development

Three respondents made suggestions that focussed on the functionality and design of the app. For instance, in response to the challenge that there are too many apps, one idea was to combine the different functions of breastfeeding apps into one app. In responding to poor internet coverage, one idea was to make information available offline. Finally, in addressing accessibility issues, one respondent highlighted the need to ensure the app was of good quality.

"Make important information available offline."

vi) Senior approval

In response to wariness of introducing a commercial app, two respondents suggested the app should have senior approval in the form of sign-off or reassurance.

"Reassurance that the information is evidence based and not commercially funded."

vii) Staffing considerations

Three individuals raised suggestions around staffing in response to varied challenges. Suggestions included ensuring that staff have time to discuss breastfeeding, through to increasing feeding specialist availability in hospitals.

"Have more feeding specialist available in the community on the PN wards and NNU."

viii) Use mother's phone

Finally, two respondents suggested that to deal with challenges such as poor internet or slow work phones, they could use the mother's phone instead.

"Show them on their phone."

We asked respondents to rate some of the key challenges of introducing Anya, from a list of potential issues. We also asked respondents to offer solutions. Figure 6 provides a summary of these challenges and solutions.

Figure 6. Summary box highlighting key challenges of introducing Anya alongside potential solutions.

- ✓ Respondents identified a wariness of **introducing a commercial app** as the biggest challenge facing implementing Anya. Other concerns include:
 - The accessibility of the app.
 - The supporting infrastructure.
 - Scepticism of Anya.

- ✓ To deal with these challenges, respondents identified the need for:
 - Information and transparency.
 - Appropriate supporting infrastructure.
 - Further support and training.
 - Women to be told about the app before their baby is born.
 - Making changes to the app.
 - Having senior sign-off.
 - Ensuring there are enough staff.
 - Utilising the mother's own phone.

4.7. Feelings about Anya

We asked respondents to identify their feelings about Anya, shown in the Figure 7 word cloud. Supplemental data were qualitatively analysed and is presented below alongside the word cloud.

4.7.1. Staff perspectives on Anya: feelings

Staff were asked "What one word describes how you feel about using a breastfeeding app with mothers?" The purpose of this question was to support the visualisation of how staff feel. A total of 44 staff responded and most of these responses are displayed in Figure 7.

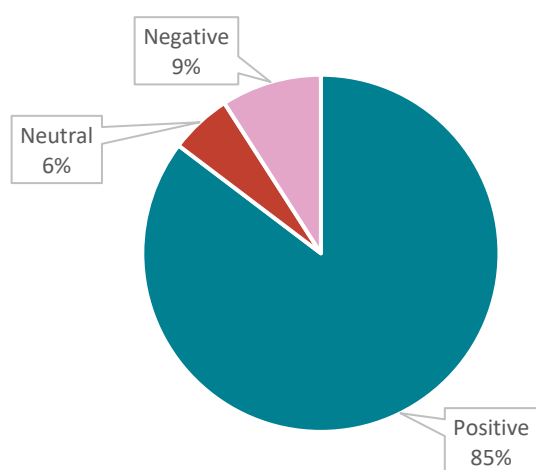
Figure 7. Word cloud illustrating how staff felt about using a breastfeeding app.



Staff were explicitly asked to select feelings they identified with, in relation to introducing the Anya app to pregnant women or new mothers. A total of 49 staff responded and they were able to select multiple responses. The options they could choose from, along with the frequency of responses are shown in [Table 8](#). To minimise bias, in the survey options we offered a similar number of positive types of feelings to negative types of feelings.

32 respondents (65%) identified they felt positive about introducing the app; the most commonly identified feeling. Nearly half associated the app introduction with being professional (49%, n=24). It is noteworthy that less than one in three reported they associated the introduction with feeling confident (31%, n=15) and further work should be considered around increasing staff confidence.

Figure 8. Proportion of positive, neutral and negative responses to introducing Anya.



A small minority identified with feelings that were neutral or negative. However, it is important to consider that such views may impact on the implementation. Figure 8 and [Table 9](#) illustrate the types of responses in further detail.

4.7.2. Staff perspectives on Anya: tell us more

20 respondents provided further information to the question “Tell us more about your answer”. These were grouped into positive, neutral, negative, mixed or missing responses.

i) Positive responses

Of the 11 all-positive responses, staff were generally enthusiastic and suggested that the Anya app would be another tool in their belt.

"I think it'll be a great tool for us MCAs to use whilst giving support to Mother's and their families."

Others expressed it was a positive, future-oriented move as app technology becomes more embraced:

"Women look more to digital platforms for information so it should be something they're comfortable with."

It is noteworthy that even among those who gave all-positive ratings, there were three respondents who expressed qualifications or concern. One person said they would need to see the app to be sure. Another qualified their response by saying it would need to support mother's needs. A further respondent was concerned about accessibility for mothers who did not have a mobile phone.

"Concern for those that do not have a mobile device that they miss out so need to be able to demonstrate on a work device."

ii) Neutral, negative, mixed and missing responses

Of the nine respondents in this combined group of responses, six respondents highlighted they lacked sufficient information to be able to make an informed judgement and that they would need to see the app for themselves. This resonates with some of the hesitant comments in the positive response group.

"In theory would be confident & happy to signpost but without viewing the content of the app cannot give a true opinion."

"Don't know enough about it yet."

One respondent whose response was neutral, commented that the move towards apps is concerning because it moves away from personal connection. Another respondent noted the pervasive use of technology with current parents.

4.8. Supporting mothers with the Anya app

4.8.1. Confidence in supporting mothers with the Anya app

A total of 48 people rated their confidence in supporting mothers to use the Anya app; see Figure 9 for an overview. Almost four in five respondents (79%, n=38) had a confidence level of at least 'somewhat confident'. The 'somewhat confident' rating was the most commonly rated confidence level with a third of respondents selecting this. This would appear to suggest that further work needs to be undertaken to improve staff confidence in using the app and demonstrating it to mothers.

In order to identify which workforce groups require confidence support, we analysed some of the key staff groups (Figure 10). We assigned a score to each confidence rating (1=Very unconfident, 5=Very confident). We then calculated the mean confidence rating. This clearly shows that Health Visitors rated their confidence levels lower overall (2.8; total n=10) than Community Midwives (4.3; total n=7). To ascertain the role of staff age and work experience, we compared confidence scores using these as variables. There was no discernibly clear pattern (Figures 11 and 12).

Figure 9. How confident staff feel in supporting mothers with using the Anya app

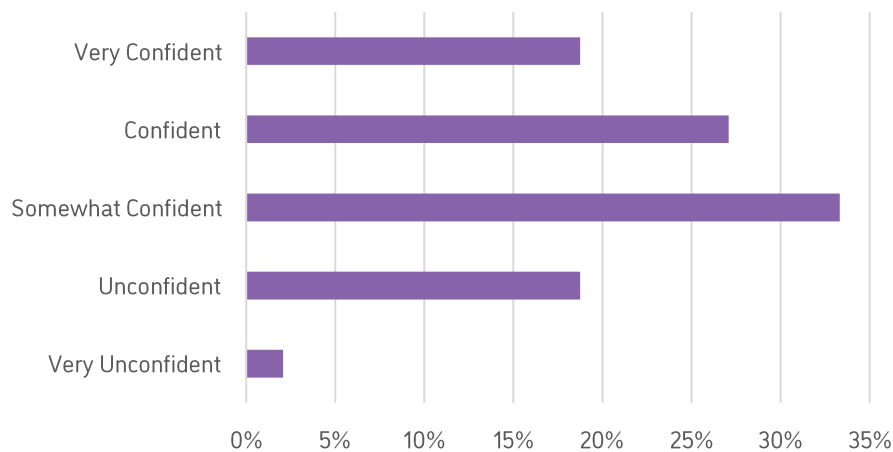


Figure 10. Confidence in supporting mothers to use Anya app broken down by key staffing roles.

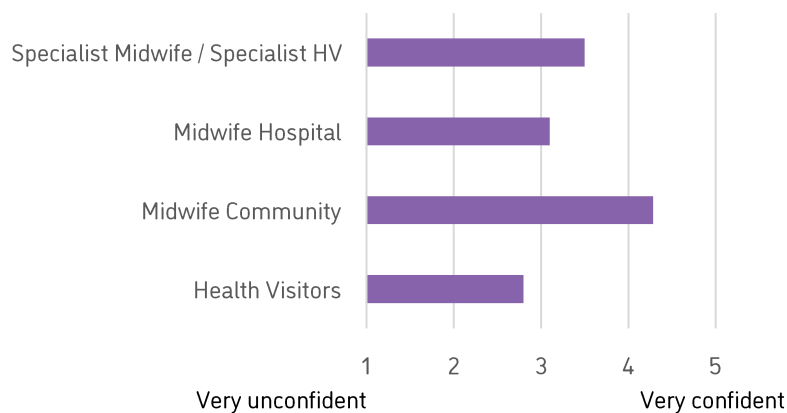


Figure 11. Confidence scores in introducing app to mothers vs. maternity work experience.

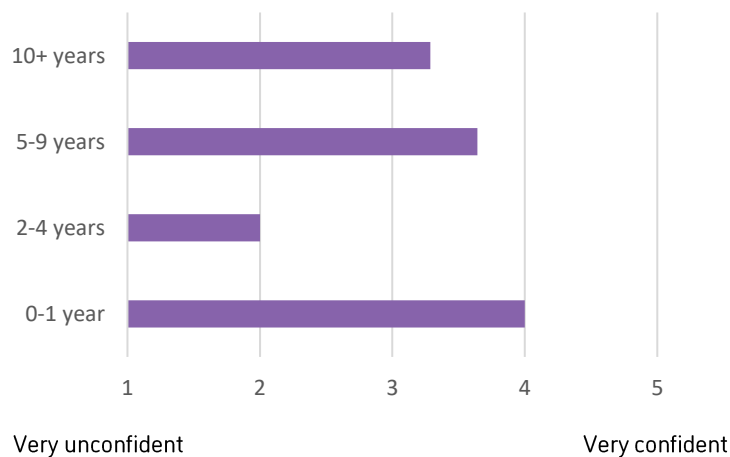
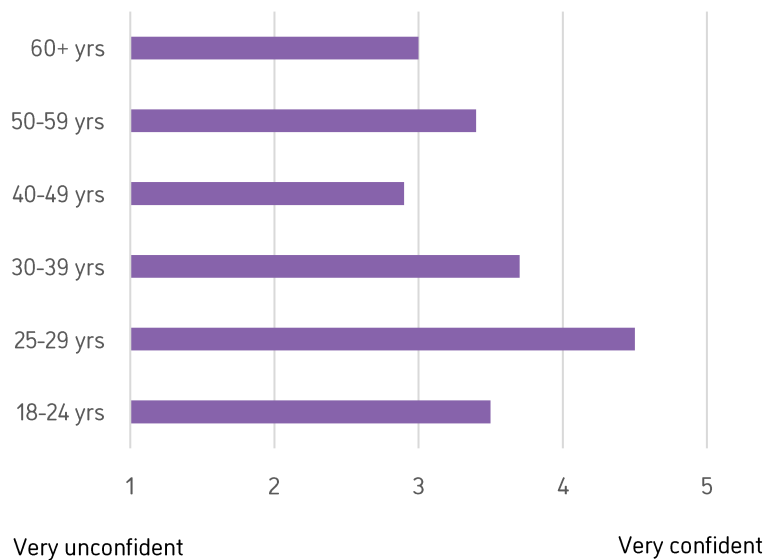


Figure 12. Confidence scores in introducing app to mothers vs. staff age group.



4.8.2. Ease of introducing mothers to the Anya app

A total of 48 individuals rated how easy it would be to introduce Anya to mothers in clinical work. These results are presented in Figure 13. Almost half of respondents rated this 'somewhat easy' (48%, n=23). This suggests there is further work to be done around the process of introducing Anya.

Figure 13. How staff rated the ease of introducing Anya to mothers.

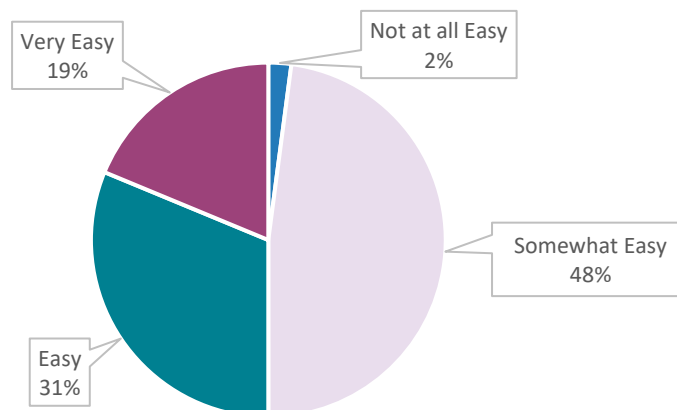
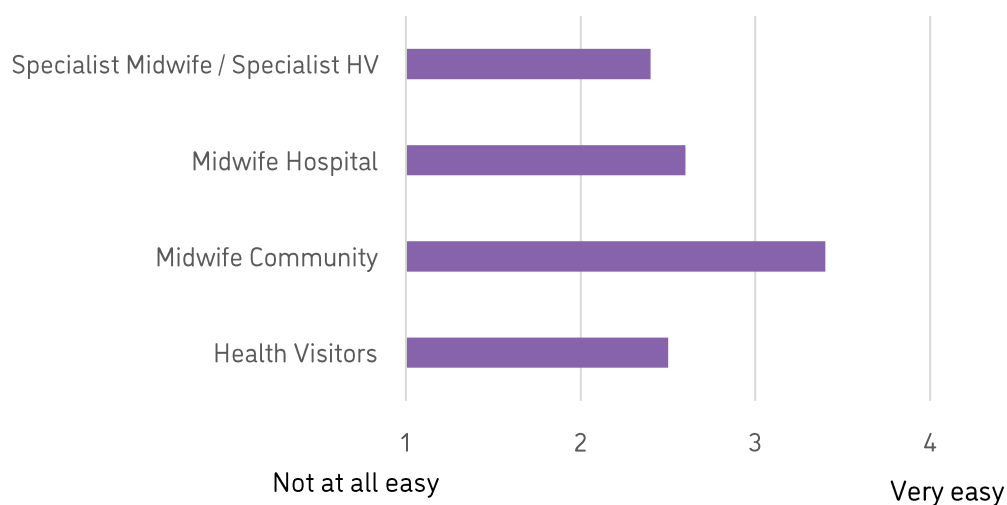


Figure 14 shows that Community Midwives (n=7) perceive the app to be easier to introduce in clinical practice than three other staff groups, namely Health Visitors (n=10), Hospital Midwives (n=9) and Specialist Midwives/Health Visitors (n=5). However, this should be interpreted with caution given the low numbers of respondents across roles.

Figure 14. Average scores for ease of introducing Anya by staff groups.



4.9. Staff comments on implementation

The last survey question invited staff to offer any other comments that could influence how Anya is implemented in clinical practice. A total of 17 staff members responded and four themes were identified relating to implementation. These are summarised in the infographic in Figure 15.

Figure 15. Key themes derived from comments on implementation.



i) Move forward

In the first theme, there was a sense of momentum or enthusiasm for Anya to be implemented. Two staff requested that the project team makes all staff (and “not just managers”) aware of Anya so that mothers hear about it.

“When can we get it!”

“Ensure every midwife and mca etc know about it so every member of staff can tell breastfeeding Mother’s”

ii) Here's a suggestion

The second theme consisted of constructive suggestions staff made, so this has been called *here’s a suggestion*. One person noted the importance of accessibility for those who do not speak English.

Three others noted the importance of integrating information about Anya into the clinical pathway so that it is accessible to staff. Two staff refer to Badgernet and whether this system can be used to promote Anya.

"I think it should be available in different languages".

"It can be added easily into postnatal conversation when talking about the off the the best start leaflets".

iii) Show us first

The third theme is *show us first*, which reflects staff views on the importance of seeing or practicing Anya before it is implemented. Three staff responses contributed to this theme and the importance of trials facilitating staff knowledge or confidence, came across.

"Let me practice so I know what I'm talking about."

iv) Hold on

The final theme is *hold on* and six staff responses formed this theme. This theme can be understood as expressions of concern, reservation or scepticism surrounding the introduction of Anya. One person was concerned about the poor functionality of their phone to host Anya. Another was concerned about the app replacing specialist feeding advisors. Others expressed scepticism about the likely impact of Anya in clinical practice, with two staff concerned about the potential for inequitable access given the app requires internet access.

"Only mothers that are already intending or motivated to breastfeeding may actually download and use it"

"It won't be available to some of our more vulnerable women who don't have data or credit, this potentially will only reach and be of benefit to those women who can afford the support."

In summary, the responses reveal variation in the enthusiasm towards Anya being implemented, with some staff very excited and a minority expressing reservations.



5. Discussion

Having presented the findings, we use the discussion section to reflect on how this insight can inform the implementation of Anya across the breastfeeding care pathway. We draw on the COM-B model (10) to provide a structured framework to interpret the results, before turning to offer recommendations for the implementation. Finally, we briefly consider the strengths and limits of this survey, providing the reader with an opportunity to contextualise the findings.

5.1. The impact on adoption of technology (*capability and self-efficacy*)

Our survey offers unique insight into the confidence staff have around using and implementing mobile technology in their healthcare practices. The first concept in the COM-B model is capability. This refers to how able an individual perceives themselves to engage in a particular behaviour. Responses suggest a highly experienced workforce in maternity care, with 99% of respondents having used a smartphone app and 71% having used an app at work.

However, despite the extensive workforce experience, most staff (69%) did not show high levels of confidence in introducing Anya to women. With just over half of respondents (52%) rating themselves as 'somewhat confident' or 'unconfident', we suggest the survey data offers a mixed picture of staff confidence to use smartphone apps, particularly when contrasted with the extent of professional experience within this group.

In the introduction, we highlighted the well-researched concept of self-efficacy, which is related to confidence. Self-efficacy describes the perceived judgement of how well an individual thinks they can perform an action (8). Self-efficacy is not necessarily a true reflection of future performance; it can be faulty or accurate (8). However, it has been found to be an important, positive predictor of whether individuals intend to recommend the adoption of mobile health services (9). In other words, a higher degree of self-efficacy is related to a higher intention to recommend the adoption of mobile technology.

Alongside self-efficacy, other research has identified that perceived ease of use is an important factor in the adoption of mobile technology. For example, **if the technology is perceived as effortful**

or painful to use, adoption will be negatively impacted (14). Perceived ease of use relates to the core concept of *effort expectancy* in the Unified Theory of Acceptance and Use of Technology (15), which is a model that predicts the perceived likelihood of technology adoption (16). Thus, if technology is expected to be effortful, individuals will be less likely to intend to use it and adopt it.

In our data, 48% of respondents rated introducing the Anya app to mothers as 'somewhat easy' and 2% rated it 'not at all easy'. A significant proportion of the workforce anticipated some difficulties in introducing Anya. This raises the possibility that there may be a reduced behavioural intention to adopt the Anya technology within part of the staff workforce.

Figure 16. Summary box for the impact on adoption of technology.

- ✓ In summary, there is evidence that a proportion of the workforce lack confidence in introducing the app to mothers and expect there to be some difficulties.
- ✓ Once the app is implemented in the maternity system, continuous monitoring of its successful deployment is essential. This will enable us to determine whether there are specific staff or teams who need support.
- ✓ Enabling staff to grow in confidence and exposing them to successful experiences of introducing the app will contribute to an effective implementation.

5.2. Opportunity with constraints

The second concept in the COM-B model is opportunity, and it refers to those factors outside of the individual that make the behaviour a possibility (10). Overall, the survey data indicates that community-facing staff have good opportunity to introduce Anya and engage pregnant women in conversations about using Anya to support their breastfeeding. We reach this conclusion on the basis that the majority of community-facing staff (i.e. Health Visitors and Community Midwives) have a work mobile phone. In addition, our survey data highlights that staff have opportunity to signpost women to a wide variety of supportive breastfeeding resources. If staff can signpost women to diverse resources, it should follow they have the opportunity to signpost to Anya. However, there are personal, resource and structural barriers that should be considered.

A substantial number (n=14) of staff in the survey highlighted the lack of professional breastfeeding support in hospital and community settings available to mothers. A key concern respondents held was that there were time-limits to their capacity to support women to breastfeed. Indeed, 23% of staff believed they lacked the time to introduce the Anya app, whilst 43% were concerned they may forget to introduce it. **The pressures of time and workload, alongside technical concerns have been cited as barriers to the adoption of m-health technology**, whilst management support has been noted as a facilitator to adoption (17).

Staff in the survey reported they lacked access to breastfeeding resources that accurately acknowledges the challenges of breastfeeding. Moreover, respondents noted they lacked resources that demonstrated successful latching or offered reliable sources of practical breastfeeding support. In theory, the Anya app should fill this resource gap in that it provides an engaging 3D animation to

facilitate latching. Indeed, the app was born from a personal struggle with breastfeeding⁹, highlighting the upstream drive from *service users*, who seek better breastfeeding resources. Staff may need to be explicitly directed as to how the Anya app can meet the unmet needs identified in this survey.

Meanwhile, a small minority of survey respondents noted the infrastructure challenges of poor phone platforms with respect to software and hardware, alongside poor internet connectivity that could hinder the opportunity to introduce Anya. For some staff there are also policies in place that prohibit the use of phones in work with patients. One review article identified the lack of devices for delivering e-health technology as the second most common barrier to implementation (17).

Figure 17. Summary box for opportunity with constraints

- ✓ Whilst insight from the survey indicates that some staff groups have good opportunity to introduce Anya and engage pregnant women in conversations about using Anya, there can be a range of **technical barriers to the implementation of digital technology** (18).
- ✓ Often the complexity behind designing behaviour change interventions can be compounded by the technical issues that digital interventions carry.

5.3. Motivational and attitudinal barriers to staff engagement

The third concept in the COM-B model is that of motivation. Individuals must have the drive to engage in a particular behaviour. Many of the survey respondents indicated they felt positive and enthusiastic about introducing Anya. However, nearly 20% of those with work phones would not consider using them to demonstrate Anya. Of course, this means that the majority (71%) would consider using their work phone (the remaining 10% selected 'other').

Unfortunately, we do not know why individuals were open or closed to the use of their work phones to demonstrate Anya. This could be local policy, personal preference, or even an infrastructure issue. Accordingly, the implementation should be monitored as the app is deployed.

Our survey also revealed staff attitudes to collaboration with industry might be a barrier to implementing Anya. Over 50% of staff identified as being wary of introducing a commercial app. Meanwhile, a proportion of staff reported feeling indifferent (16%) or reluctant (2%) to introduce the app. **Whilst most staff reported positive feelings around introducing Anya to mothers, there are evidently motivational barriers** that should be addressed to facilitate its successful implementation.

Previous research highlights the importance of staff attitudes to successful implementation. Prejudices or negative attitudes can lead to a reluctance to use digital services (19) and this often

⁹ See [Anya's website](#) for a brief story of the beginnings of Anya.

follows a lack of involvement at design stage as well as poor usability experience of the intervention. Authors of the NASSS (Non-adoption, abandonment, scale-up, spread, and sustainability) framework (13) argue that non-adoption of technology can be explained by the threat that staff perceive to their roles, employment and patient safety.

Figure 18. Summary box for motivational and attitudinal barriers to staff engagement

- ✓ Most staff are enthusiastic about the Anya app. However, there is evidence of motivational barriers to the successful implementation.
- ✓ Ensuring staff are engaged and open to the technology is clearly an important part of successful intervention.

5.4. Strengths and limitations

This survey afforded maternity staff, working across two NHS Trusts, an opportunity to share their views and feelings. A strength of this survey is that it gives voice to a highly experienced workforce and provides resulting insights that can prepare the implementation and evaluation of Anya to be successful. Whilst the survey was designed to generate insight, it may also have supported initial staff engagement with Anya by reminding them of its pending deployment.

The low response rate should be considered a limiting factor to some of the findings in this report. We do not claim to have sought a representative sample from the staff population. It is therefore possible that a sampling bias is present, which could give rise to those with stronger viewpoints or greater confidence in utilising mobile phone technology, being more likely to participate. However, we did capture both enthusiastic voices as well as sceptical and dissenting voices, so the extent of any potential bias should be understood in this context.

Of further note is the lack of any male responses. Although one might expect the maternity workforce to have a higher representation of female staff, the 100% female response rate does curtail the perspective of male workers.

Finally, the two main staff groups we are working with in the implementation of Anya, namely Community Midwives and Health Visitors, comprised just 42% of survey respondents. A higher engagement among these staff may have provided a greater level of insight.



6. Conclusion

6.1. Summary

Healthcare systems are complex environments and we do not expect an intervention to be successfully implemented merely because it is available. We undertook this staff survey to generate key insights that would lay the groundwork for the successful implementation and evaluation of Anya. Along the way, this survey has offered staff an opportunity to voice their views and feelings surrounding the implementation of Anya and the use of smartphone technology.

Our survey indicates the maternity workforce is highly experienced in providing care. The majority of staff have experience in using smartphone apps and most have used apps in a work context. However, many staff did not identify as being confident in introducing Anya and moreover, some staff reported they would not demonstrate Anya on their work mobile phones to patients. We identified a high degree of enthusiasm towards the Anya app, yet simultaneously found that many staff were cautious about Anya being a commercial app. Finally, we note the pressures of time and remembering to introduce Anya, alongside the structural challenges of technology, such as poor performing work phones and internet connectivity that could affect implementation.

6.2. Recommendations

We finish this report by offering seven targeted recommendations. We anticipate these recommendations may mitigate the potential challenges that staff have identified.

6.2.1. For senior NHS and LMNS staff

- i) As Hospital Midwives do not have work mobile phones, consideration should be given by LMNS and Trust Managers as to how staff can demonstrate Anya, if requested to by women.
- ii) To address staff concerns about the supporting infrastructure for phones, conversations between LMNS and Trust IT departments should take place. These should explore whether IT departments can test the capability of work mobile handsets and Trust wifi to ensure that Anya can be used and demonstrated.
- iii) Senior NHS staff should provide clarity on local Trust policy regarding the use of personal or work phones to demonstrate Anya. This policy should then be communicated to staff and the project FAQs should be updated.

6.2.2. For Anya project staff^h

- iv) To address lower confidence levels among Health Visitors, familiarisation sessions with this staff group could encompass the demonstration of Anya.
- v) Consideration could be given to having regular support sessions available to all staff, perhaps in the early stage of implementation. This could help address staff whose confidence in using digital technology is reduced.
- vi) During familiarisation, steps should be taken to reassure staff regarding the commercial nature of Anya. Project staff should emphasise the app has DTAC and ORCHA approval; it has been approved by senior NHS colleagues and has been used in other NHS systems. Furthermore, consideration could be given to highlighting how the Anya app was conceived following the innovator's own personal struggle to find appropriate breastfeeding support.
- vii) Finally, to ensure staff remember to introduce Anya, the implementation should consider how to facilitate prompts within the maternity pathway.

^h Namely, staff in Health Innovation West of England who are managing the delivery of the real-world evaluation of Anya.



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8. Appendix 1: Tables

Table 1. Respondents' experiences of using mobile apps.

Have you ever used a smartphone app?	% using mobile phone apps	Number of respondents
Yes – at home only	28%	21
Yes – at home and work	71%	53
Yes – at work only	0%	0
No – I have never used a smartphone app	1%	1

Table 2: Key professional roles and mobile phone access and use data.

Professional role	% with work mobile phones	% would consider using work phone to demonstrate Anya	% would not consider using work phone to demonstrate Anya
Community Midwife	100% (n=9)	89% (n=8)	11% (n=1)
Health Visitor	92% (n=11)	56% (n=5)	44% (n=4)
Hospital Midwife	0% (n=0)	n/a	n/a

Table 3. Staff confidence levels across phone platforms.

Confidence rating	Confidence using phone platform		Confidence supporting mothers by phone platform	
	Android (n=72)	iOS (n=71)	Android (n=71)	iOS (n=71)
Very unconfident	7%	11%	4%	10%
Unconfident	19%	14%	18%	18%
Somewhat confident	21%	7%	30%	6%
Confident	24%	14%	18%	18%
Very confident	29%	53%	30%	48%

Table 4. Confidence levels among staff groups to support mothers using different app platforms.

Platform	Confidence levels	Community Midwives		Health Visitors	
		%	n	%	n
iOS	Very unconfident	0%	0	8%	1
	Unconfident	11%	1	17%	2
	Somewhat confident	11%	1	8%	1
	Confident	11%	1	33%	4
	Very confident	67%	6	33%	4
Android	Very unconfident	0%	0	8%	1
	Unconfident	11%	1	17%	2
	Somewhat confident	11%	1	25%	3
	Confident	33%	3	33%	4
	Very confident	44%	4	17%	2

Table 5. Clustered breastfeeding resources that staff reported they currently signpost mothers to.

Breastfeeding resource	%	Number of respondents (n=44)
WHO, UNICEF, Baby Friendly Initiative (BFI) or Off to the Best Start	11%	14
National NHS resources (e.g. website, app)	11%	13
Gloucestershire Breastfeeding Supporters' Network (GBSN)	10%	12
Breastfeeding Network or National Breastfeeding Helpline	9%	11
Local staff / NHS services	7%	9
Support groups/networks	6%	7
La Leche League	5%	6
Local NHS resources – leaflets, website	5%	6
Other charity / organisation	5%	6
International Board of Lactation Consultant Examiners / Local lactation consultant	4%	5
Own experience	4%	5
Knitted Breast	3%	4
Volunteers / keyworkers	3%	4
YouTube videos	3%	4
Anya	2%	3
Best Beginnings / Baby Buddy App	2%	2
Leaflets / posters	2%	2
Unclassified	7%	9

Table 6. Table showing concerns respondents have about introducing Anya.

Challenges arising from introducing Anya	%	Number of respondents (n=51)
I am wary of introducing a commercial app	53%	27
I don't have good internet coverage in the community	43%	22
I may forget to introduce the app	43%	22
I lack the time to introduce the app	23%	12
I lack confidence using the app	18%	9
Mothers won't be interested in the app	14%	7
I feel unsure how to introduce the app to mothers	12%	6
I have other priorities	10%	5
Other	29%	15

Table 7. Table illustrating the interpretation involved in matching challenges with solutions.
Table shown in-text for illustrative purposes.

Table 8. Table showing feelings of staff around introducing Anya.

Feeling description	Type	%	Number of respondents (n=49)
Positive	Positive	65%	32
Helpful	Positive	53%	26
Professional	Positive	49%	24
Enthusiastic	Positive	35%	17
Confident	Positive	31%	15
Excited	Positive	16%	8
Indifferent	Neutral	16%	8
Uncertain	Negative	12%	6
Unprepared	Negative	8%	4
Nervous	Negative	2%	1
Reluctant	Negative	2%	1
Unprofessional	Negative	2%	1

Table 9. Types of responses to introducing Anya.

Response Type	%	Number of respondents (n=49)
Positive	85%	122
Neutral	5%	8
Negative	9%	13



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