# Developing a coaching manual to provide human support for the Mothers and Babies Online (eMB) perinatal mental health intervention

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## ARTICLE INFO

## ABSTRACT

*Background:* Depression that occurs in pregnancy or postpartum (perinatal depression) impacts 1 in 5 mothers, yet access to effective and high-quality preventative interventions remains elusive for most. Digital interventions are a promising solution to this treatment gap because of the ubiquity of mobile devices and internet access. The Mothers and Babies Online Course (eMB) is an online adaptation of Mothers and Babies, an evidence-based preventative program for postpartum depression. Preliminary studies of eMB point to its potential efficacy, but low engagement with eMB was a major limitation. Leveraging home visitors as coaches to guide clients through eMB may be a way to increase uptake and engagement, and ultimately improve outcomes when implemented in home visiting programs.
*Objective:* The aim of this study was to implement user-centered design methods to develop a coaching manual for home visitors to implement eMB.
*Methods:* 10 parents and 10 home visitors were interviewed individually. Measures included a "think aloud" activity and a semi-structured interview focused on gaining insight into parent and home visitor needs and preferences regarding eMB coaching in the context of home visiting. Thematic analysis was used to derive themes and sub-themes from interview transcripts.
*Results:* Parents were enthusiastic about eMB, but noted barriers including limited time and forgetfulness. Parents also thought that their home visitor would be the ideal eMB coach because of the existing close relationship. Home visitors shared that eMB would fit seamlessly into their home visiting workflow. They also thought that home visitors could address challenges that parents encounter in using eMB and leverage their relationship with parents to crystalize learning. Home visitors also noted that a coaching manual would be a key part of successful eMB implementation. Thus, valuable insights from parents and home visitors were used to create a coaching manual.
*Conclusions:* Parents and home visitors were both enthusiastic about eMB with adjunctive coaching, and home visitors agreed that a coaching manual would be vital in guiding them to help parents through eMB. Results highlight the importance of engaging end-users in all aspects of online intervention design, including the coaching manual. The effectiveness of the intervention and utility of the coaching protocol will be evaluated in a future pilot trial.

## 1. Background

Perinatal depression (depression that occurs during pregnancy or the first postpartum year) is the most common complication of childbirth in the United States (US) (Toohey, 2012). Around 10–20 % of perinatal individuals suffer from major depressive disorder (Gavin et al., 2005;

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Woody et al., 2017), while up to 80 % experience postpartum "baby blues," or transient low mood after giving birth (Rezaie-Keikhaie et al., 2020). As the leading cause of maternal mortality in the US, perinatal depression not only has significant consequences for mothers but it is also associated with compromised mother-infant bonding and poor child socioemotional development (Beck, 1998).

Recent work has shown that preventative interventions for perinatal depression may be the best approach to promote maternal mental health (Curry et al., 2019). Numerous prevention programs have been developed and empirically tested (O'Connor et al., 2019), yet patient, provider, and system-level barriers keep perinatal individuals from accessing the help they need (Place et al., 2024; Webb et al., 2021). Furthermore, even when maternal mental health services are available, insufficient family leave and lack of childcare are major barriers, especially among families with lower socioeconomic status (Byatt et al., 2012). Home visiting (HV) provides a promising setting for delivering preventative interventions for perinatal depression, with HV rapidly proliferating across the US due in large part to federal investment initially provided through the Affordable Care Act (Minkovitz et al., 2016). Home visitors promote the health and well-being of perinatal individuals through regular visits during and after pregnancy, making them ideal providers to integrate discussions of mental health support to parents during the perinatal period (Duffee et al., 2017). Addressing mental health, particularly maternal depression, is of critical importance as research has demonstrated that up to 50 % of parents receiving HV services have clinically elevated levels of depression during the perinatal period (Ammerman et al., 2010; Ward et al., 2022).

Mothers and Babies (MB) is an evidence-based manualized perinatal depression prevention intervention that targets mood, stress, and mother-infant attachment. MB has been successfully implemented in home visiting settings and was cited by the United States Preventive Services Task Force as one of the two most effective interventions for preventing perinatal depression (Curry et al., 2019). However, barriers remain related to home visitor bandwidth and capacity to deliver MB, leading to variability in intervention dosage. For example, recent studies indicated that only slightly greater than 50 % of intervention sessions were received by HV clients receiving both the group- and individual-based versions of MB (Tandon et al., 2021, 2022). Digital mental health interventions (DMHIs) that do not rely on a home visitor to deliver intervention content, therefore, have the potential to generate greater engagement with MB. This is likely to lead to greater improvements in mental health outcomes given findings showing a dose-response relationship between MB sessions and depressive symptom improvement (Tandon et al., 2022).

One pathway to increasing engagement and improving outcomes with preventative interventions for perinatal depression may be to leverage self-guided DMHIs (Danaher et al., 2012; O'Mahen et al., 2013). Internet interventions —i.e., web-based interventions accessible via computer or mobile device—are a particularly promising modality given the ubiquity of internet access on computers, tablets, and smartphones (Webb et al., 2017). Birthing people are becoming increasingly comfortable using the internet as a source of information about mental health during the perinatal period and may prefer web-based content over formal mental health treatment (Fonseca et al., 2016; Franco et al., 2023). A recent systematic review and meta-analysis showed that web-based interventions significantly improved symptoms of perinatal depression and were highly satisfying for patients (Li et al., 2023).

Barrera and colleagues developed an online, self-guided adaptation of MB, the Mothers and Babies Online Course (Barrera et al., 2015). Content is rooted in cognitive behavioral therapy (CBT), attachment theory, and social-learning theories, and aims to help individuals manage their mood and reduce stress through the perinatal period (Muñoz et al., 2007). eMB contains similar content to the original MB program, and was restructured to include videos, worksheets, and readings to take full advantage of the web-based modality. eMB includes eight modules/lessons, each focused on a different area of perinatal

mental health (e.g., Lesson 2: Thoughts and Mood; Lesson 5: Pleasant Activities). Lessons are intended to be completed in order, one lesson per week, although parents may ultimately use eMB at their own pace and are encouraged to return to prior lessons as needed. Preliminary evidence suggested that eMB may reduce the risk of depressive symptoms during the postpartum period, although these findings were not significant because the study was underpowered (Barrera et al., 2015). While the results from this study were promising, participants were recruited through the internet instead of through home visiting programs where the strongest evidence for MB exists. This study of eMB had additional limitations such as low engagement and high attrition, and used a naturalistic, uncontrolled study design.

Prior work has shown that incorporating an element of human support, such as a coach, may lead to a more successful implementation of internet interventions (Lattie et al., 2019; Meyer et al., 2022). The supportive accountability model leverages the relationship between users and a coach, whose perceived expertise and bond with the user facilitate accountability, which then sustains engagement throughout digital treatment (Mohr et al., 2011). Several well-controlled studies have demonstrated that interventions bolstered with human support of some kind (e.g., therapist, coach) are effective in reducing symptoms of perinatal depression (Danaher et al., 2013; O'Mahen et al., 2013). Home visitors are ideal candidates to serve as coaches because they already engage in key constructs from supportive accountability such as social presence, performance monitoring, and trustworthiness (Damashek et al., 2020).

A coaching manual is a guide for individuals serving as human support for digital interventions (i.e., coaches). Careful design of a coaching manual is essential for effective and sustainable internet-based interventions (Lattie et al., 2019). Manual content should correspond to the needs and preferences of the coaches and users and be customized to the idiosyncrasies of each intervention. Employing user-centered design (UCD) methodologies is an ideal way to elicit recommendations and feedback from end-users (Abras et al., 2004). While research on UCD to specifically guide the development of adjunctive coaching manuals is in its infancy, prior research has shown that UCD practices enhance usability, acceptability, and engagement in digital interventions, ultimately leading to better outcomes (Lattie et al., 2022).

This study was the first phase in a larger eMB pilot prevention trial, where eMB was to be implemented in home visiting with home visitors serving as eMB coaches. Prior to starting the trial, it was critical to engage in formative UCD work to develop a workable coaching manual for home visitors, based on input from HV clients and home visitors. As such, the aim of this report is to describe the process of developing an eMB coaching manual that is informed by qualitative interviews of eMB coaches and eMB parent end-users. The interviews focused on possible challenges for parents using eMB, how parents want to engage with eMB coaches, how home visitors view the role of coaching, and how home visitors envision integrating eMB into the existing home visiting workflow.

## 2. Methods

### 2.1. Study design

Individual purposive qualitative interview methods (Miles and Huberman, 1994) were used to explore parent and home visitor preferences around eMB coaching, and ultimately develop a coaching manual for home visitor eMB coaches that meets parent needs and suits home visitors' existing workflow. We used the "think aloud" method and semi-structured interviews with parent end-users and home visitors to identify potential challenges and difficulties for parents with the eMB intervention and to gain insight into their respective needs and preferences around eMB coaching in the context of home visiting. Findings from the "think aloud" activity and interviews were then integrated in the development of the eMB coaching manual.

## 2.2. Participants

Home visitors were recruited from an internal list of HV programs that agreed to be contacted for research. HV agencies were contacted and invited to participate in virtual informational meetings about the study. If a program agreed to participate, home visitor and parent client recruitment flyers were sent to programs to share with their home visitors. Any home visitor was eligible to participate. Home visitors who agreed to participate referred their clients based on the following eligibility criteria: 1) enrolled in HV services and were the primary HV client, 2) 16 years or older, 3) English proficient (reading, speaking, and writing), 4) pregnant or up to 12 months postpartum, 5) had access to the internet, and 6) had access to an electronic device (cell phone, laptop, tablet, etc.). Eligibility criteria were confirmed by study staff. It was estimated that a sample of 10 home visitors and 10 parent end users would be sufficient for both our think aloud activities and semi-structured interviews. The possibility of conducting additional semi-structured interviews was left open if saturation was not met. The final sample consisted of 10 parents and 10 home visitors across seven HV programs in Illinois, South Carolina, Virginia, and Pennsylvania. These HV programs used a variety of evidence-based home visiting models including Parents as Teachers (PAT), Healthy Families America (HFA), Early Head Start, and Healthy Steps (Models eligible for Maternal, Infant, and Early Childhood Home Visiting (MIECHV) funding, 2024).

## 2.3. Procedures

Data collection took place remotely via Zoom in August through October 2022. Enrolled home visitors referred parent clients to the study. Procedures were the same for parent and home visitor participants. At the beginning of the sessions, consent was obtained verbally and documented. Next, participants answered a set of demographic questions via electronic survey. After, the "think aloud" activity was completed, then semi-structured interviews were conducted. All interviews were audio recorded and transcribed for data analysis, then archived on a secure server. Interview guides can be found in the Supplemental Materials. On average, interviews lasted 60 min (Range = 43–87 min). Participants received $35 in return for their participation. All procedures were approved by the Northwestern University and Palo Alto University Institutional Review Boards (IRBs).

## 2.4. Measures

### 2.4.1. Demographics
Parents were asked demographic questions such as race/ethnicity, age, and number of children. Home visitors were asked demographic questions such as race/ethnicity, age, and gender.

### 2.4.2. Think aloud activity
During the "think aloud" activity (Jaspers et al., 2004), parents and home visitors shared their screens with the interviewers as they explored the eMB website. Interviewers observed home visitors and parent clients as they interacted with eMB, and encouraged them to share their thoughts while using the website. As participants clicked on any feature, they were asked to narrate their experience, verbally express if they liked/disliked a feature and why, and share any other thoughts they had during the activity. Sample questions included: *"what do you think the purpose of this feature is?", "what do you think is the main takeaway from this feature?,* and *"what was confusing or not clear?"*

### 2.4.3. Semi-structured interview for parents
A semi-structured interview was used to identify what parents might be looking for from an eMB coach. Topics covered included the following: 1) Support home visitors could provide parents around eMB, 2) How eMB might fit into day-to-day life, 3) What can improve eMB

engagement, and 4) How parents might use and benefit from eMB.

### 2.4.4. Semi-structured interview for home visitors
A semi-structured interview was used to identify how home visitors can help parents use eMB as a coach, what home visitors view as feasible in coaching, and how they envision integrating eMB coaching into their existing workflow. Specific topics covered included: 1) How to integrate eMB into home visiting program workflows, 2) Appropriate strategies for home visitors providing human support to support eMB engagement, and 3) Potential barriers and facilitators to eMB engagement.

## 2.5. Data analysis

Audio recordings of all sessions were transcribed. Descriptive statistics were calculated for the demographic data. Transcripts were coded using an initial codebook developed prior to coding and deductive and inductive approaches were employed (Padgett, 2012). Initial codes and sub-codes were developed based on the interview questions, and emergent codes were identified and integrated during the coding process. Any changes to the codebook were documented to serve as an audit trail. Each transcript was coded by two experienced qualitative coders using MAXQDA (Version 2022). Coders met to discuss discrepancies and reach consensus. Saturation was reached once no new codes emerged (Saunders et al., 2018). Summaries of each code and sub-code guided the development of themes and sub-themes. The results from the thematic analysis were used to create a coaching manual that guides eMB coaches to implement eMB. The coaching manual was reviewed and refined by perinatal mental health experts on the eMB research team. These experts incorporated additional evidence-based information and tools to the coaching manual that were not explicitly suggested by the UCD interviews.

## 3. Results

### 3.1. Sample characteristics

Ten parents and 10 home visitors consented to participate in the interviews. 70 % (*n* = 7) of parents identified as White, 10 % (*n* = 1) as other race, and 20 % (*n* = 2) as bi−/multi-racial, with a mean age of 28.8 years (SD = 5.33). Parent participants reported having given birth to none/currently pregnant (n = 1, 10 %), two children (*n* = 5, 50 %), four children (n = 2, 20 %), and five or more children (n = 2, 20 %). One home visitor did not report their age, and the remaining nine home visitors reported a mean age of 39.33 (SD = 9.15). Eight home visitors identified as women (80 %), one home visitor identified as a man (10 %), and one home visitor did not report their gender (10 %). The racial composition of home visitors was White (n = 5, 50 %), Black (*n* = 3, 30 %), American Indian/Alaska Native (n = 1, 10 %), and Black and White multiracial (n = 1, 10 %).

### 3.2. Parent interview results

Three themes were identified in the thematic analysis of the parent interviews: (1) parent preferences for eMB use, (2) parent barriers to eMB use, and (3) parent view of the role of coaching.

#### 3.2.1. Parent preferences for eMB use
All parent interviewees (*n* = 10) indicated that they felt eMB seemed like a great program. They shared that the eMB website was easy to navigate, contained easy to understand information, and was well organized. The website interface appeared easy-to-use, clear, and straightforward, though they would prefer more color or graphics. Parents identified the "personal projects" content (i.e., lesson homework) as particularly useful:

*"You can kind of incorporate [personal projects] into your life and really have you think of how you think it could be utilized in your daily life instead of, you know, just the examples that were given."*

(P08, Parent)

Additionally, parents shared that they liked that eMB can be accessed when they have time in their days or when they need it, and they do not have to wait for a home visit to learn valuable skills to help cope with stress:

*"Good for stressful days, if I want to lean on something, can find info quickly."*

(P11, Parent)

*"I don't have nobody, you know, I'm saying, like, I can rely on this website as like, somebody having my back."*

(P01, Parent)

### 3.2.2. Parent barriers to eMB use

The most prevalent parent barrier to using eMB was lack of time. Between daily "*routines*", "*workload*", and balancing "*responsibilities*", they noted that it could be hard to add anything into their day, even if they felt it would be beneficial. As one parent stated, "*even 10 minutes can be a lot*" (P03, Parent) regarding using eMB.

Another barrier identified by parents was forgetfulness. Though unintentional, parents noted that they are juggling their child/children and remembering eMB might be difficult:

*"like a reminder to remember to do a session would be helpful."*

(P05, Parent)

Though they were optimistic they would access eMB, it was a concern. Additionally, although none of the parents said internet or Wi-Fi issues were a concern for themselves, some did note technology issues as a potential barrier for other parents who might want to use eMB.

### 3.2.3. Parent view of the role of coaching

Most parents expressed a desire for support from a coach while using eMB. Parents reported that trusting their home visitors allowed them to discuss sensitive topics, and that eMB would be more effective with a coach:

*"Personally, I really liked my [home visitor], so I feel like I would be open with her and honest … just knowing that she's there like to support it really. I don't know, I just feel really comfortable with her."*

(P10, Parent)

Parents suggested that coaches might implement a reminder system to help them complete lessons. Parents wanted weekly text message reminders in lieu of emails or phone calls from their home visitor eMB coach. Furthermore, they stated that home visitors could check in during their regularly scheduled visits to see how the eMB program was going and if they had any questions or would like to expound on any topics. Though parents noted that they could do eMB without reminders or check-ins, they emphasized that coaching would help with engagement in eMB:

*"And I think, maybe reminders would be helpful. Not because you necessarily forget about your mental health, but a lot of times we don't make it a priority. So just having a constant reminder of, hey, this is available to you would help well."*

(P08, Parent)

### 3.3. Home visitor interview results

Three themes were identified in the thematic analysis of the home visitor interviews: (1) home visitor preferences for integrating eMB coaching into workflow, (2) home visitor identified barriers to eMB use,

and (3) home visitor view of the role of the eMB coach.

### 3.3.1. Home visitor preferences for integrating eMB coaching into workflow

The consensus among home visitors was that eMB would be acceptable to parents and easily integrated into their home visits and their workflow:

*"If I'm not available, then they can go to that website, and maybe get that answer that they were going to ask me."*

(HV05, Home Visitor)

*"[eMB is] absolutely complementary [to regular HV visits]."*

(HV04, Home Visitor)

Others shared that eMB would be a good addition to their existing home visiting routine by saying:

*"This [eMB] would be like a bonus"*

(HV04, Home Visitor)

*"[eMB is] helpful as a supplement to our program because I love [name of home visiting model], but it's a little bit lean when it comes to dealing with, you know, perinatal mood and anxiety disorders, let's just say it how it is, they're getting better."*

(HV11, Home Visitor)

Three home visitors pointed out that receiving some type of notification (via email or text) when their parent client has completed an eMB lesson would be helpful for their workflow. This notification system would allow home visitors to prepare content to review during their regularly scheduled visits:

*"I can kind of prepare myself for what I'm about to walk into, because sometimes you don't know. And you're kind of bombarded with everything. So, I really liked that idea."*

(HV11, Home Visitor)

Several home visitors also said that they would use time during regular home visiting sessions to set small goals with parents around completing eMB lessons followed by weekly check-ins to track parents' progress.

Several home visitors commented that eMB would create a safe space to discuss struggles that may lead to judgments in other spaces:

*"I think that it would lead to some kind of open conversations with parents that I don't really get to have right now"*

(HV03, Home Visitor)

### 3.3.2. Home visitor identified barriers to eMB use

Home visitors provided insightful feedback on potential barriers to serving as an eMB coach for their parent clients. The home visitors' main concern was "*additional workload*." They also expressed that they might not have extra time during their regular visits to discuss eMB in addition to their preset lesson plan. Home visitors also voiced concern about providing technical support for parents using eMB, which they viewed as outside of the scope of their work:

*"And I can tell you, the [home visitors] do not want to be burden as tech support for them."*

(HV01, Home Visitor)

Home visitors also mentioned structural barriers to eMB use such as low literacy level, no non-English language options, and lack of reliable access to a smart device and/or internet:

*"Out of the 15 families I work with, I have 13, Hispanic, and Latinos who are all Spanish speakers. And with that being said, there's a range of education backgrounds, some who haven't completed primary Elementary School."*

(HV09, Home Visitor)

### 3.3.3. Home visitor view of the role of the eMB coach

Nine out of ten home visitors shared that it was feasible to take on the role of eMB coach. Since home visitors already text their parent clients almost weekly, they were willing to check in on parents' progress with eMB during regular check-ins, provide encouragement to parents to complete the eMB program, and provide feedback so their parent clients feel supported.

The home visitors provided a variety of suggestions for what they would need to be an effective coach. For example, they suggested creating a coaching manual for home visitors with resources to help them guide parents through eMB, implementing an *"in-depth"* training for home visitors on how to navigate the eMB website during visits, creating *"quick printable cheat sheets"* for easy reference during visits, and creating a resource list for home visitors for additional help beyond eMB:

> *"It [a coaching manual] could be something that gives them at least like a foundation of like, okay, so this is kind of how I can bring it up and talk to them about it. I think it would be helpful."*
>
> (HV04, Home Visitor)

### 3.4. Development of the coaching manual

The goal of the coaching manual was to provide a guide for home visitors to implement eMB within their existing home visiting workflow. Most sections of the coaching manual were derived from themes identified through the qualitative analysis of parent and home visitor interviews as summarized in Sections 3.2–3.3. The manual was then fleshed out by clinical experts on the eMB research team. Overall, the coaching manual contains the following sections: (1) information about the content of eMB (e.g., personal projects, lessons), (2) directions for how to set parents up with eMB, (3) an overview of the goals and objectives of the eMB coach, (4) psychoeducation on coaching through supportive accountability and motivational interviewing, (5) frequently asked questions for quick troubleshooting, (6) instructions for tracking coaching, (7) risk management procedures, and (8) additional information related specifically to the research study (e.g., study staff contact information). The eMB coaching manual is intended to be accompanied by a 45-minute synchronous virtual training for home visitors focused on how to use eMB and the coaching manual. Details about how qualitative themes map onto the content of the coaching manual can be found in Table 1.

## 4. Discussion

The goal of this study was to apply user-centered design (UCD) methods to create a home visitor coaching manual for the Mothers and Babies Online Course (eMB), a self-guided online intervention for perinatal depression and stress. To our knowledge, this was the first study looking at how to add adjunctive coaching to an online perinatal depression preventative intervention. A diverse sample of parents and home visitors were interviewed about how they thought they would use eMB, barriers to using eMB, and how they viewed the role of a home visitor eMB coach. Interviews were analyzed using thematic analysis and results were used to create a coaching manual designed to facilitate effective eMB coaching. Coaching manual content mapped onto needs and suggestions identified by parents and home visitors. The end goal is to implement the coaching manual in the first home visitation pilot trial of eMB with adjunctive human support (i.e., home visitor coaches). Critical findings from the study and implications for future work are highlighted next.

### 4.1. Summary of findings

Overall, we found that both parents and home visitors agreed that adding adjunctive coaching for eMB would be beneficial. This finding is

**Table 1**

Coaching manual development overview.

Each row corresponds to a section of the coaching manual. "Section Content" details the topics covered in each section. "Themes Identified from Interviews" and "Sub-themes Identified from Interviews" show how results from the qualitative interviews of parents and home visitors were used to develop each section of the coaching manual.

| Coaching manual section | Section content | Themes identified from interviews | Sub-themes identified from interviews |
|---|---|---|---|
| About eMB | • eMB Overview<br>• Description of eMB content: Personal Project and breakdown of 8 lessons | 3.2.1 Parent preferences for eMB use<br><br>3.3.3 HV views of the role of the eMB coach | • Parent preferences for personal projects and the flexibility to use eMB at their own pace<br>• HV preferences for familiarity with eMB materials |
| Accessing eMB | •Instructions for how HVs can access eMB and assist parents with setting up eMB | 3.3.3 HV views of the role of the eMB coach<br><br>3.2.2 Parent barriers to eMB use | •HV preferences for in-depth training on website navigation |
| Coaching Goals and Objectives | •Five key coaching objectives: (1) address tech issues; (2) enhance engagement; (3) promote personalization of materials; (4) foster deep understanding of eMB concepts; (5) encourage application of eMB lessons in real life | 3.2.3 Parent view of the role of coaching<br><br>3.3.1 HV preferences for integrating eMB coaching into workflow<br><br>3.3.3 HV views of the role of the eMB coach | • HV preferences for integrating eMB into their workflow and having resources for guidance on eMB<br>• Parent preference for receiving reminders from HV<br>• Parent reported difficulties finding time to complete eMB |
| Coaching through Supportive Accountability with Motivational Interviewing (MI) | •Rationale and guidelines for providing motivational interviewing | 3.3.3 HV views of the role of the eMB coach | •HV preferences for guidelines to deliver eMB. |
| Potential FAQs from Parents and Example Responses Keeping MI in Mind | •Common questions (i.e. technology questions) from parents and sample answers to these questions | 3.3.3 HV views of the role of the eMB coach | •HV preferences for quick fact sheets or cheat sheets for easy reference during visits |
| Tracking Your Coaching | •Explains how the research team monitors HV coaching | *N/A–For research purposes* | *N/A–For research purposes* |
| In Case of Risk | • Guidance on responding to parent self-harm thoughts and behaviors<br>• Relevant mental health resources | 3.3.3 HV views of the role of the eMB coach | •HV preferences for additional resources beyond eMB |
| Contact Information | • Details about the research team<br>• Provide the eMB team's email address | 3.3.2 HV identified barriers to eMB use | •HV concerns about the additional burden of providing tech support to parents |

*(continued on next page)*

**Table 1** (*continued*)

| Coaching manual section | Section content | Themes identified from interviews | Sub-themes identified from interviews |
|---|---|---|---|
| Additional Resources | • Advice for HVs to contact the team for any tech issues. <br><br> •Psychoeducation on perinatal depression | 3.3.3 HV view of the role of the eMB coach | •HV preferences for having additional resources beyond eMB |
| References | •References for research cited in this manual | *N/A* | *N/A* |

Note. HV = home visitor.

in line with a growing literature examining the effects of human support on the effectiveness of internet-based interventions; many studies have shown that human-supported interventions are superior to self-guided interventions (Borghouts et al., 2021; Lipschitz et al., 2023). Furthermore, home visitors were enthusiastic about the prospect of coaching their clients through the eMB program, and parents noted that their home visitor would be the ideal choice to serve as an eMB coach. Both parents and home visitors emphasized the trust and closeness that is developed through home visiting. This is important because the therapeutic alliance has been identified as a potential mechanism by which coaching leads to better outcomes (Solness et al., 2023). As such, psychoeducation and training on building and maintaining an effective alliance were incorporated into the eMB coaching manual.

Critically, home visitors were enthusiastic about learning how to be an effective eMB coach and were interested in specific tools to help them with this new role. As a result, training in supportive accountability and motivational interviewing were added to the coaching manual. Supportive accountability is a coaching model rooted in the idea that coaching increases engagement because the coach holds the user accountable for using the intervention (Mohr et al., 2011). Motivational interviewing (MI) complements the supportive accountability model as a set of tools for behavior change that coaches can use to help their eMB clients adhere to the eMB program (Miller and Rollnick, 2012). Importantly, coaches were not trained to deliver MI as an intervention, and coaches were not intended to play a therapeutic role because prior work has shown that a significant amount of training and ongoing supervision is needed for MI to be effective in home visiting (Biggs et al., 2018). Rather, in this study, MI was presented as a supportive practice to help home visitors understand barriers to engagement with their clients, and ultimately help home visitors increase their clients' engagement with eMB. For example, the coaching manual describes the MI technique of "rolling with resistance," and an eMB coach might use this technique with a client who is having trouble finding time in her day to engage with the eMB program.

Themes from parents and home visitor interviews also converged on the idea that parents would likely need a reliable reminder system to keep them engaged throughout the eMB program. We know from prior work that one of the core functions of the digital intervention coach is to increase engagement and adherence to the treatment (Borghouts et al., 2021), and that poor engagement and attrition were major limitations in the first trial of the entirely self-guided version of eMB (Barrera et al., 2022, 2015). Instructions for implementing personalized text-based reminders were an important feature of the coaching manual developed in this study and emphasized in the "Coaching goals and objectives" section. Future work might focus on testing a range of reminder/notification frequencies to determine the minimum necessary requirements for eMB adherence and effectiveness.

Home visitors expressed concern about the workload that eMB coaching might add to their already full schedules, but they were open to

integrating eMB into their existing home visiting workflow. The coaching manual contains suggestions for how to effectively integrate coaching into their home visits, including how to tailor the frequency and duration of eMB coaching sessions to meet a parent client's specific needs. Whether these suggestions are actually adopted by home visitors, and if they lead to better adherence/outcomes are empirical questions to be answered after the eMB coaching manual is piloted in a trial.

Home visitors also saw value in using time during the home visits to customize the eMB experience for their parent clients by reviewing content, answering questions, and crystalizing learning. The coaching manual contains sample questions home visitors can use to initiate meaningful, personal discussions about eMB with their parent clients. It also contains information about the "personal project." Parents conduct their personal projects throughout the eMB program outside of home visits and coaching sessions. The personal project is analogous to therapy "homework" which is a pillar of many evidence-based treatments and is one important mechanism by which clients achieve their therapy goals (Kazantzis et al., 2016). The eMB coaching manual contains recommendations for home visitors to help parents stay motivated between sessions and work towards their goals.

Ultimately, the coaching manual developed in this study is intended to be accompanied by training and support provided by experts in eMB, as has been done in prior Mothers and Babies trials in home visiting (Le et al., 2015). For the ongoing pilot RCT, home visitors received a 45-minute synchronous virtual training, monthly check-ins from the research team to address ongoing issues, and 12 months of ad-hoc consultations for up to a year post-training to address implementation barriers and questions. A final phase of this pilot trial will include user experience interviews with home visitors to assess the utility and acceptability of the coaching manual after its implementation in the RCT. Results will inform future iterations of the coaching manual.

*4.2. Limitations*

Results of this study should be interpreted in light of three key limitations. First, participants were invited to join the study voluntarily, and were selected for interviews on a first-come first-served basis, leading to a high probability of self-selection bias in our sample. This may have resulted in only highly motivated individuals participating, impacting the generalizability of our results. Also, the absence of reliable demographic information from HV programs leaves unanswered questions about the representativeness of our sample. Relatedly, parents were referred by their home visitors, redoubling the potential for selection bias in the parents. Second, unknown participant characteristics such as parent depressive symptoms, home visitor work experience, and comfort with digital products may have biased participants' feedback, also limiting the generalizability of our results. Third, our results were vulnerable to social desirability bias–it is possible that participants provided answers that they thought would be favorable to please the study team. Furthermore, our analysis did not include triangulation with an independent expert, which may have led to biased findings. Finally, this study was conducted solely in English, despite feedback from home visitors that many clients they serve are primarily Spanish-speaking. While eMB is available in Spanish (Barrera et al., 2015), the current work was only foundational. Future studies should take a user-centered approach to adapting the coaching manual for the potential unique needs and cultural considerations of Spanish-speaking users and coaches.

*4.3. Conclusion*

In conclusion, we developed a comprehensive coaching manual for home visitors to support the use of eMB with their parent clients. We used UCD methods to investigate what parents and home visitors want and need from eMB coaching, and used these insights to create the final coaching manual. This study laid the foundation for future work focused

on implementing eMB with adjunctive coaching in the context of home visiting. Next steps include a randomized controlled trial to test the effectiveness and implementation of eMB in home visiting with coaching in preventing perinatal depression and managing stress. If effective, eMB with coaching is a promising solution to the perinatal mental health treatment gap given it was designed for implementation at scale. Our goal is to deploy eMB in home visiting programs that serve pregnant people and parents across the US, particularly in rural and underserved communities.

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## Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Bayley J Taple reports a relationship with RealizedCare that includes: employment. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.invent.2024.100792.

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