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Be a Mom Coping with Depression: a Feasibility Study of a Blended Cognitive-Behavioral Intervention for Postpartum Depression

Mariana Branquinho[1] · **Maria Cristina Canavarro**[1] · **Ana Fonseca**[1]

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Abstract

A blended cognitive-behavioral intervention for postpartum depression (Be a Mom Coping with Depression) was developed, consisting of the combination of seven face-to-face sessions (delivered through videocall) with six online sessions in a web-based program. This study aimed to assess the intervention's feasibility, acceptability, and preliminary effects on depressive symptoms. A single-arm pre- and post-test study was conducted, and adult Portuguese women in the postpartum period (up to 12 months) with a clinical diagnosis of a major depressive episode were eligible to participate ($n = 9$). Participants completed self-report measures and were interviewed after completing the intervention. Eight participants completed the blended intervention. The recruitment rate was low, but the adherence to treatment was high. Participants reported several advantages of this intervention and high levels of satisfaction. The blended intervention was found to be feasible and acceptable, and a reduction on depressive symptoms was observed in our sample. These results support the conduction of a randomized controlled trial to assess the efficacy of this blended intervention and provided important information to proceed with the necessary modifications.

Keywords Acceptability · Be a Mom Coping with Depression · Blended intervention · Feasibility · Postpartum depression

Introduction

The postpartum period, defined as the time after childbirth and extending for the following 12 months (Batt et al., 2020), represents a time of increased risk for mental health problems due to the demanding changes and challenges that women face

✉ Mariana Branquinho
marianacjbranquinho@hotmail.com

[1] University of Coimbra, Center for Research in Neuropsychology and Cognitive Behavioral Intervention, Faculty of Psychology and Educational Sciences, Coimbra, Portugal

(Finlayson et al., 2020). Postpartum depression (PPD) is one of the most prevalent psychiatric disorders during this period worldwide (Gelaye et al., 2016). In Portugal, it affects approximately 13% of postpartum women (Maia et al., 2011). The literature has consistently demonstrated the negative effects that PPD can have for a mother and baby as well as for the family system if it is not properly treated (Slomian et al., 2019). In addition, the recent COVID-19 pandemic has contributed to an increased prevalence of PPD (about 22%; Yan et al., 2020), as well as a higher risk of developing this mental health problem (Hutchens & Kearney, 2020).

This is particularly concerning given that few women seek professional help for their depressive symptoms during the postpartum period (Fonseca et al., 2015). Women report several practical barriers (e.g., reduced time, childcare or job limitations, and transportation issues) that prevents them to attend appointments with a mental health professional (Daehn et al., 2022), as well as a difficulty to access healthcare, associated with high costs of treatment, limited availability of professionals, and long waiting time (Bina, 2020). In addition, attitudinal factors (e.g., stigma and shame associated with PPD and perceptions about psychological treatment) also act as barriers to seek treatment for PPD (Bina, 2020).

E-mental health tools (i.e., the use of digital technology applied to mental health field; Riper et al., 2010) can play an important role in overcoming these treatment barriers, given their potential to reduce costs, increase flexibility, and improve accessibility (Lal & Adair, 2014). Several web-based interventions for PPD treatment have been developed (e.g., Loughnan et al., 2019; O'Mahen et al., 2013) and proved to be effective in reducing depressive symptoms (Ashford et al., 2016; Mu et al., 2021). However, web-based self-led interventions have strong limitations related with low engagement and high attrition rates (due to the absence of therapist support during the intervention; Andersson & Titov, 2014; Nair et al., 2018). Also, they do not allow to address specific problems and can limit the inclusion of more vulnerable groups (e.g., low literacy women; Andersson & Titov, 2014) and, therefore, could be insufficient to increase treatment rates among this population.

Blended Interventions

In the past decade, there has been increased interest in developing blended interventions, a new format of treatment delivery that combines face-to-face psychotherapy with e-health tools (e.g., web-based interventions) into one intervention protocol (Erbe et al., 2017). Including these tools in a blended treatment, with face-to-face and online elements being provided within the same period in an integrated and sequential format (Erbe et al., 2017), can be advantageous in many ways. First, it can improve treatment flexibility and accessibility (Kloek et al., 2020; Schuster et al., 2018b). Second, blended interventions can contribute to the development of self-management skills (Kloek et al., 2020). Given that online tools can make contents and materials available anywhere at any time, it contributes to better preparation for sessions with the therapist (Mol et al., 2020; Urech et al., 2018). For instance, elements of psychotherapy such as psychoeducation and exercises can be delivered through the web-based tool, providing the patients with the opportunity to learn and practice before the sessions (Ebert et al., 2018). Additionally, the disadvantages that

are usually reported when using web-based tools alone (e.g., high dropout rates) can be mitigated in blended interventions because therapists are available to provide individual support and manage possible crises and therefore increasing motivation and engagement (Urech et al., 2018; Wentzel et al., 2016). In fact, a systematic review on blended interventions for the treatment of mental health problems revealed lower attrition rates and saving therapists' time associated to blended interventions (Erbe et al., 2017).

Blended interventions for psychological problems are, then, the combination of the "best of both worlds" (Wentzel et al., 2016, p. 2), allowing to optimize and intensify treatment by replacing some face-to-face sessions or complementing them with modules through a web-based program (Erbe et al., 2017). In fact, Mendes-Santos et al. (2020) reported that about two-thirds of a sample of Portuguese psychologists demonstrated a preference for blended interventions when compared to only web-based interventions, and that most professionals who were already using digital tools viewed them as a complement to and not a substitute for face-to-face psychotherapy. In addition, positive attitudes regarding blended interventions have been reported by patients and clinicians (Van der Vaart et al., 2014). Studies indicated that participants presenting depressive symptoms who received a blended treatment demonstrated satisfaction (Høifødt et al., 2013; Kooistra et al., 2016), as did the therapists providing blended treatment (Mol et al., 2020). A systematic review about blended interventions for the treatment of depression, anxiety, or substance abuse was conducted (Erbe et al., 2017), and the results indicated that most blended interventions were based on cognitive–behavioral therapy (CBT) and many interventions lasted between 8 and 12 weeks. There is also evidence of the effectiveness of blended interventions in reducing symptoms of depression (Høifødt et al., 2013; Kooistra et al., 2019) and anxiety (Witlox et al., 2021) in the general population.

This evidence is encouraging to develop a blended intervention for the treatment of PPD, since it could help women overcome some treatment barriers often reported. A recent study in Portugal revealed that postpartum women presenting depressive symptoms agreed that a blended intervention would be helpful and that they would be available to receive this treatment (Branquinho et al., 2021). However, to the best of our knowledge, there has been no blended intervention specifically established for PPD treatment.

In line with this, a blended CBT intervention for PPD—Be a Mom Coping with Depression—has been conceived in the Portuguese context (Branquinho et al., 2020), combining face-to-face sessions with a psychologist and a web-based program. The web-based program was previously created as a self-guided tool for the prevention of PPD among Portuguese women presenting a high risk for PPD (Fonseca, Pereira, et al., 2018). The results of a randomized controlled trial (RCT) indicated that this tool was effective in reducing depressive symptoms among these women, and therefore, it was included in this blended intervention (Carona et al., 2023). Be a Mom Coping with Depression follows CBT principles (e.g., problem-oriented, educative, structured, and time-limited) and includes third-wave CBT contributions such as elements of self-compassion and acceptance and commitment therapy (Fonseca et al., 2020). The CBT therapeutic components included in this intervention consist of psychoeducation, strategies to deal with negative thoughts, valued-based behavioral activation, and relapse

prevention. This intervention also includes strategies to activate social support networks, develop communication and problem-solving skills, and improve couples' relationships.

The Importance of Feasibility Studies

Feasibility studies aim to test innovative interventions and are focused on the process of development and implementation, as well as the participants' response to the treatment (Gadke et al., 2021; Orsmond & Cohn, 2015). The results can then provide important information to prepare and support the further conduction of an RCT with a large sample to test the efficacy of newly developed interventions (Orsmond & Cohn, 2015). According to several authors, feasibility includes dimensions as the recruitment capability, procedures, fidelity of implementation, and potential effectiveness (Gadke et al., 2021; Orsmond & Cohn, 2015). Acceptability, which is the extent to which an intervention is considered to be appropriate by the target population (including intervention contents, characteristics, perceived effectiveness and costs; Sekhon et al., 2017), usability and satisfaction should also be assessed since they are important indicators of participants' experiences (Newton et al., 2021).

Some research has been conducted on this topic for the development and evaluation of blended interventions (Fitzpatrick et al., 2018; Kooistra et al., 2016; Wilhelmsen et al., 2013). For instance, a feasibility study assessed a blended CBT intervention for depression in terms of its usefulness, system usage, and participants' evaluations of the treatment format (Schuster et al., 2018a). Participants obtained improvements in the reported symptoms and demonstrated satisfaction with treatment and computer elements. Another feasibility study conducted by Wilhelmsen et al. (2013) included a qualitative evaluation of participants' motivation to engage in a blended CBT-based treatment for depression and the results generated important implications for further implementation of the intervention. Qualitative data are also of particularly valuable in a feasibility study since they offer relevant information about the participants' perceptions about the intervention's strengths and weaknesses and how it can be improved (O'Cathain et al., 2015). Then, both quantitative and qualitative information are of great relevance in a feasibility study.

Objectives

This feasibility study aimed to evaluate the Be a Mom Coping with Depression intervention in terms of its (1) feasibility (recruitment, dropout rates, patterns of usage, and therapist fidelity); (2) acceptability (participants' opinions about the contents, structure, accessibility, advantages and disadvantages of the intervention, perceived effectiveness), usability, and satisfaction, and (3) potential in reducing depressive symptoms.

Method

Study Design

A single-arm pre- and post-test study was conducted between March 2021 and January 2022 to assess the feasibility, acceptability, and preliminary effects on depressive symptoms of the blended intervention in a sample of Portuguese women. This study was approved by the Ethics Committee of the Faculty of Psychology and Educational Sciences, University of Coimbra, and was registered on ClinicalTrials.gov (NCT04441879). The ethical standards and procedures for research with human beings were followed (e.g., Helsinki Declaration – World Medical Association, 2013). This study was reported according to the extension of the CONSORT 2010 statement for randomized pilot and feasibility trials (Eldridge et al., 2016).

Participants and Procedures

The inclusion criteria to participate in the study were (1) women in the postpartum period (up to 12 months after childbirth), (2) women aged 18 years or older, (3) women who were Portuguese, (4) women with a diagnosis of a major depressive episode according to the Diagnostic and Statistical Manual of Mental Disorders—fifth edition (DSM-5; American Psychiatric Association, 2013), (5) women with the necessary technological means (a computer or smartphone with internet access), and (6) women who were able to write and read Portuguese. Women were excluded if they had a psychiatric comorbidity requiring primary treatment, severe suicidal ideation, a serious medical condition (the mother or the baby—self-reported), or were receiving current psychological or pharmacological treatment for depression (medication was allowed only if it had been stabilized for three months prior to study onset—self-reported). After the study started, two changes were made to the eligibility criteria. First, residence in Portugal was no longer an inclusion criterion, given that the intervention was delivered online. Second, taking medication for the treatment of depressive symptoms was allowed because women currently receiving this treatment could also benefit from a psychological treatment if the medication dose was stabilized, so its effects should not have confounded the intervention effects.

Women were recruited through online platforms, including social media (Facebook and Instagram) and maternity forums. The main researcher created Facebook and Instagram pages for the dissemination of the research project. Paid and unpaid boosting campaigns on social media were performed to target women between 18 and 45 years of age with interest in maternity topics. These advertisements included information about the study goals and procedures, including the guarantee of confidentiality and anonymity, the possibility to withdraw at any time, and that participation was free of costs, and were followed by a weblink to a screening questionnaire. After accessing the weblink, participants were asked to provide their informed consent to participate in the study and were given access to the questionnaire, which included questions

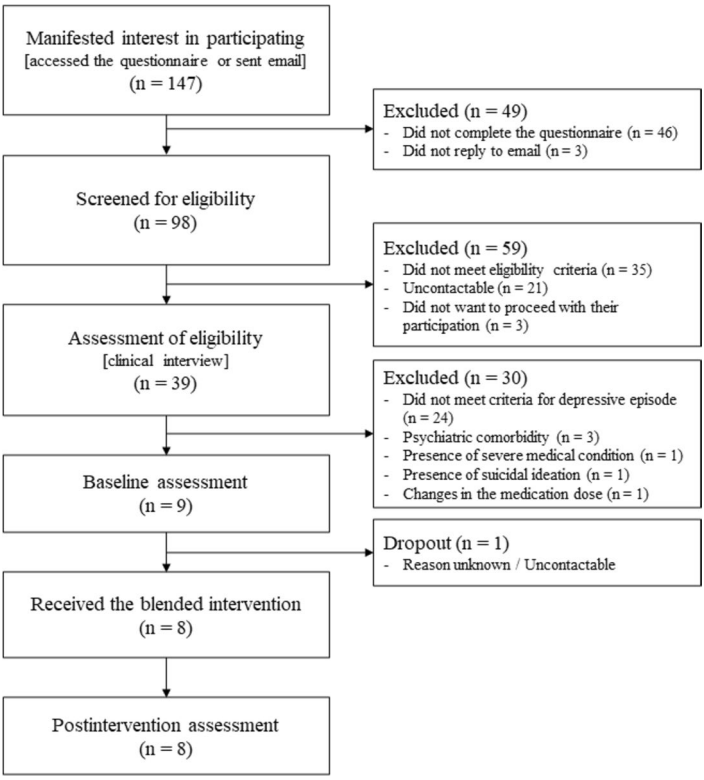

Fig. 1 Flowchart of the participants' inclusion in the study

about sociodemographic information, the Edinburgh Postnatal Depression Scale (EPDS; Areias et al., 1996) and other eligibility criteria questions (e.g., having internet access). Women were also asked to provide their contact information (e-mail and telephone number) to be further contacted by the research team.

Women with a positive screen for the presence of PPD symptoms (indicated by an EPDS score > 9; Areias et al., 1996) who fulfilled the eligibility criteria were contacted by the main researcher to schedule an interview to assess the presence of a major depressive episode. The researcher (clinical psychologist) conducted a clinical interview based on the Structured Clinical Interview for the DSM-5 (SCID-5; First et al., 2017) by telephone. Women with a diagnosis of a major depressive episode were included in the study. The participants who did not meet all the inclusion criteria were informed about the end of their participation, and the researcher discussed and proposed other treatment possibilities. Before the beginning of the intervention, the participants were asked to complete a set of self-report questionnaires (baseline assessment) that was accessed through a weblink sent by email. After the end of the intervention, the participants were asked to complete a postintervention protocol. All questionnaires (screening and pre- and postintervention) were hosted on LimeSurvey®. Figure 1 presents the flowchart of the study.

Be a Mom Coping with Depression

The development of the blended treatment protocol included, in the first phase, a literature search that was conducted on existing blended interventions for depression (e.g., Kooistra et al., 2016; Schuster et al., 2018a), as well as on evidence-based CBT interventions for PPD, delivered both face-to-face (e.g., Wenzel & Kleiman, 2015) and online (e.g., O'Mahen et al., 2013). Content and structural aspects were identified (e.g., duration of the intervention, the number of sessions), and the results of this review informed the development of the general structure for the blended intervention protocol. Afterward, modifications to the original web-based program were conducted to address some specificities of PPD, and a detailed therapist manual for face-to-face sessions was developed. Connection between the online modules and face-to-face sessions was an important aspect that was considered when developing the therapist manual to ensure that the treatment was perceived as "one." At the same time, a cross-sectional study was also conducted with the target population (Portuguese postpartum women presenting depressive symptoms) to gather information on their preferences for this type of intervention (Branquinho et al., 2021), and the results also informed the development of the blended treatment protocol. The final version of the protocol was reviewed and approved by a group of researchers with clinical expertise in the area of PPD.

The general structure of the Be a Mom Coping with Depression is presented in Fig. 2. The intervention duration is 13 weeks, and it is composed of seven sessions with a psychologist and six sessions in the online program, which are alternated weekly. The intervention was conducted by a licensed psychologist who followed a detailed therapist manual. The sessions with the psychologist were observed by a psychologist in training. Biweekly supervision sessions were provided by an experienced postdoctoral-level psychologist.

Due to the COVID-19 pandemic, several restrictions were imposed on face-to-face activities. Therefore, Be a Mom Coping with Depression was adapted to be delivered totally online, with face-to-face sessions with a therapist being replaced by videocall sessions, using videoconference tools (e.g., Zoom). Each session with the psychologist was expected to last approximately 60 minutes and started with mood check and discussion of the women's symptoms. Then, the therapist reviewed the women's experiences with the online program and each module's content—the therapist discussed the homework assignments, practiced the therapeutic strategies in-session, provided feedback, and clarified any doubts. At the end of the session, the next online module theme and objectives were presented. A detailed description of each session's content and its illustration through a case study are presented elsewhere (Branquinho et al., 2022). The interval between sessions with the psychologist was allowed to vary somewhat to provide flexibility in meeting each patient's individual needs.

The online sessions were self-guided and delivered through a web-based program (https://beamomcopingwithdepression.pt/). Participants received an invitation by email to register in the program after the first session with the psychologist. After registering, participants accessed the web-based program using an email and a password created by them. The web-based program was organized into modules

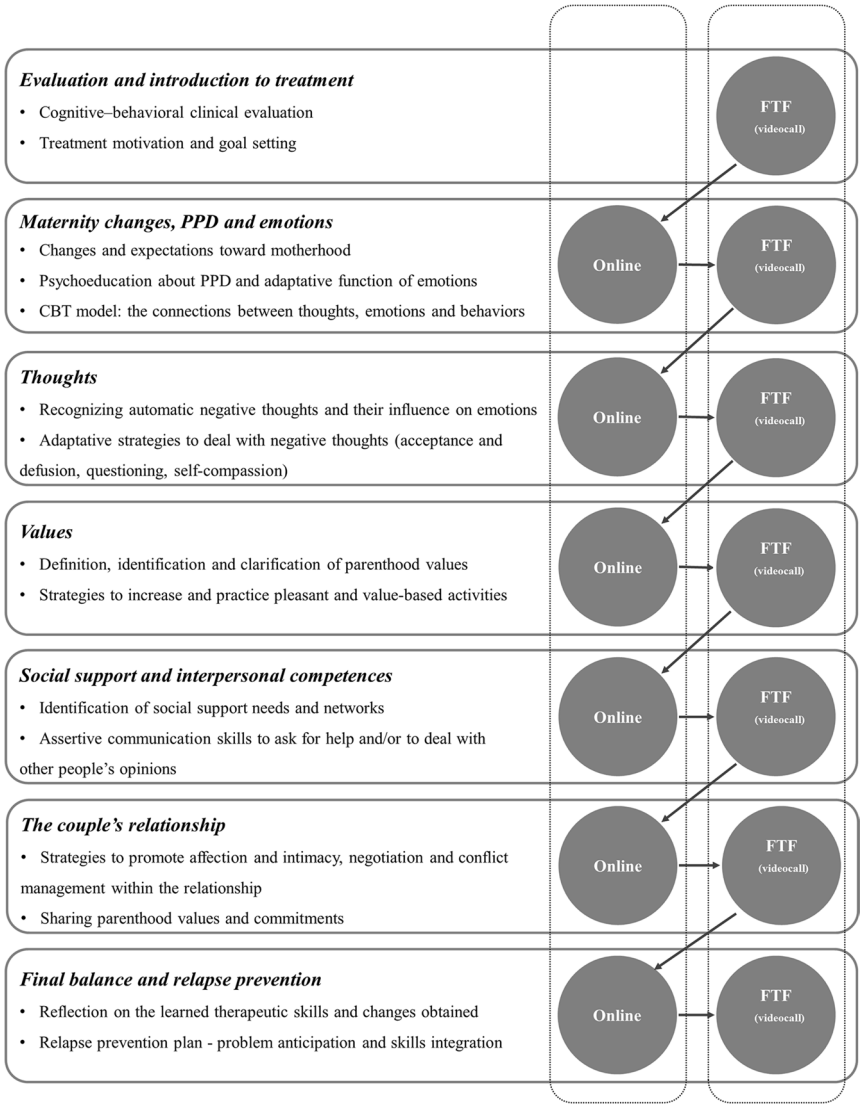

Fig. 2 General structure of the Be a Mom Coping with Depression intervention. Note. *CBT*, cognitive–behavioral therapy; *FTF (videocall)*, face-to-face sessions with the psychologist (delivered through videocall); *PPD*, postpartum depression

addressing several thematic contents (e.g., understanding postpartum depression, maternity changes, and emotions). Each online module (with an approximate duration of 30 min) was completed after a session with the psychologist, according to the instructions given. The module opened with an introduction to the session's goals and content, followed by specific information and strategies, which were presented in different formats (e.g., text, video, and audio), and ended with a reminder

of the session with the psychologist, indicating that the participant had finished that week's module. Participants could pause the session at any time and reopen the last page visited during subsequent access to the program. The web-based program also included a section with additional reading documents that were available after completing each module. An asynchronous communication channel with the therapist was available through the program, and two automatic email reminders (3 and 10 days after the participant's last access) and a phone call with the psychologist were delivered to participants between sessions to encourage their engagement. The email reminders informed that there was an incomplete module and motivated participants to access it. In the phone calls, women were asked to identify the key messages of the module, and if she did not access it, the therapist would encourage her to complete it in the next days.

Measures

Sociodemographic and Clinical Information

The women's sociodemographic (age, marital status, professional status, educational level, place of residence, and number of children) and clinical (history of psychiatric/psychological problems and history of psychiatric/psychological treatment) information was collected through a self-report questionnaire. Infant-related information (age, sex, and gestational weeks at birth) was also obtained.

Feasibility

The feasibility of the implementation of the intervention was evaluated through recruitment rates, participants' treatment adherence, participants' patterns of usage, and therapist fidelity. Completion of the intervention was considered when participants had attended all sessions with the psychologist and completed a minimum of 75% of the online modules. Information regarding the number of sessions, the average duration (minutes), and the total duration of treatment (in weeks) was obtained from the therapist's records. Website usage data were obtained from the website concerning the number of completed modules, the number of logins, the average time spent at each login (minutes), and the number of interactive exercises completed in each module. To assess therapist fidelity, the therapist completed a checklist at the end of each session to confirm that the topics of the session were covered. It was composed of 18 items related to the first part of the session (e.g., "To assess patient humor"), the session goals (e.g., "To review the exercises completed by the patient in the online module"), the final part of the session (e.g., "To remind the patient of their homework"), and transversal competences (e.g., "To demonstrate verbal empathy") that were answered with yes, no or not applicable.

Acceptability, Usability, and Satisfaction

A semi-structured interview guide with open-ended questions was developed by the research team (cf. Appendix A) to collect qualitative data on participants' acceptability, usability, and satisfaction with the intervention. Interviews were conducted to explore the participants' expectations for the treatment, opinions about the contents and structure (including the frequency and number of sessions), perceived advantages and disadvantages of the treatment format, opinions about the web-based program (language, usability, design, and exercises), and sessions with the psychologist (relevance, language used, and therapeutic relationship). Participants were also asked to reflect on any difficulties they experienced during the intervention and to provide suggestions for improvement. Participants who completed the blended intervention were invited for an individual interview, and the researcher explained its nature and purpose—to gather participants' perceptions of the intervention to help improve it for future implementation. Permission to participate and record the interview (after explaining its purpose) was obtained before its start by asking for the women's verbal consent. The interviews were conducted by the first author about one week after the end of the intervention through videoconference. The interviews were videorecorded and had an average duration of approximately 50 minutes (range from 40 to 61 minutes).

Depressive Symptoms

The Portuguese version of the Edinburgh Postnatal Depression Scale (EPDS; Areias et al., 1996) was used to assess depressive symptoms. The EPDS is a 10-item instrument (e.g., "I have felt sad or miserable") with a 4-point Likert answer scale ranging from 0 to 3. Higher scores are indicative of more severe depressive symptoms. Portuguese validation studies of the EPDS (Figueiredo, 1997) showed good levels of internal consistency (Cronbach's alpha = 0.85).

Statistical Analysis

Quantitative analyses were conducted using the Statistical Package for the Social Sciences (IBM SPSS, version 25.0; IBM SPSS, Chicago, IL). Descriptive statistics were calculated to describe the sociodemographic and clinical characteristics of the sample, recruitment data and retention data, to assess patterns of usage and therapist fidelity and to compute the mean scores of depressive symptoms. To assess the clinical changes in depressive symptoms obtained by the participants, reliable change index (RCI) scores were calculated by dividing the difference between post- and pre-treatment by the measurement error of the instrument[1] (Jacobson & Truax, 1991; Tingey et al., 1996). An RCI score higher than ±1.96 ($p < 0.05$) is indicative of a reliable change (Jacobson & Truax, 1991; Tingey et al., 1996), and a score higher

[1] $\mathrm{RCI} = \frac{(\mathrm{post}-)-(\mathrm{pre}-\mathrm{treatment})}{\sqrt{2}\left(\mathrm{SD}\sqrt{1}-\alpha\right)2}$

than ±1.28 reveals a significant change, with a 90% confidence level (Wise, 2004). To calculate the RCI scores for the EDPS, data was obtained from the sample of the study by Fonseca, Monteiro, and Canavarro (2018).

Qualitative Data Analysis

Data were transcribed verbatim in the participants' original language (Portuguese). A thematic analysis was conducted, following a data-driven approach and the procedures recommended by Braun and Clarke (2006). MAXQDA software was used to support data analysis. First, the data were read and reread by the first author for a general understanding and familiarization with the data, and initial ideas for coding were noted. Then, relevant codes to address the research questions were generated and grouped by similar meanings. The codes were sorted into potential themes and reviewed and named accordingly. Examples of relevant quotations have been translated into English.

Results

Sociodemographic Characteristics of the Sample

The sample consisted of 9 women in the postpartum period, with a mean age of 35.00 years (SD = 2.91; range from 31 to 40 years), and all of them were married/cohabiting (n = 9, 100.0%). Most women were currently employed (n = 7, 77.8%), had completed higher education (n = 9, 100.0%), and lived in an urban area (n = 7, 77.8%). This was the first child for 77.8% (n = 7) of the women. Most of the infants were female (n = 6, 66.7%), and the average age of the infants was 6.33 months (SD = 4.03; range from 1 to 12 months). Approximately 77.8% of the women (n = 7) reported a prior history of psychiatric or psychological problems (e.g., depression and anxiety) and previous psychiatric or psychological treatment (n = 7).

Feasibility

A total of 147 potential participants demonstrated their interest in the study. Approximately 93.9% (n = 138) of the potential participants were excluded for several reasons (e.g., did not answer, did not meet the eligibility criteria; cf. Fig. 1). A total of 9 women (6.1%) were eligible to participate and were enrolled in the study. Recruitment ended by achieving an approximated number of the initial estimated sample for the purpose of this study. Of the eligible participants, 8 (88.9%) completed the intervention and the baseline and postintervention assessments.

Of the participants who initiated the blended intervention, eight attended all seven sessions with the psychologist. The participant who dropped out only attended the first session. She registered in the web-based program and accessed the first eight pages of module 1, and the reason for dropout is unknown. Considering the participants who completed the intervention, the average duration of the sessions

with the psychologist was 90.1 minutes (SD = 10.0; range = 62–124 minutes). Concerning web-based program usage, 87.5% (n = 7) of the women completed the 6 online sessions. Only one participant completed 3 out of the 6 online sessions. The average number of logins was 12.5 (SD = 7.18, range = 4–30 logins). Participants spent, on average, 19.6 minutes (SD = 9.15, range = 10–38 minutes) at each login. All participants (n = 8, 100%) completed the interactive exercises in module 1 and module 2. Seven participants (87.5%) finished the exercises in module 3, with one participant completing only one exercise. The exercises in module 4 were completed by 6 participants (75%), and the exercise in module 5 was completed by 3 participants (37.5%). Three participants did not listen to either of the two audio exercises proposed, and five participants listened to them only once. The average duration of treatment was 13.5 weeks (SD = 1.2).

Therapist adherence to the therapist manual was 95%, according to the therapist checklist completed at the end of each session. A main difficulty was addressing all contents present in the therapist manual in the expected time. The main topic that was not covered due to time constraints was a review of the exercises that the participants performed in the online modules (in 17.9% of the sessions). Each session was planned to last for approximately one hour, which was not accomplished since the average duration was 30 minutes longer. The sessions with the psychologist with higher average durations (in minutes) were session 13 (M = 107.5, SD = 19.0), session 1 (M = 94.4, SD = 10.7), and session 3 (M = 93.1, SD = 14.0).

Qualitative Data

All eight participants who received the intervention were interviewed. The findings from the qualitative data analysis are discussed below, and a summary of the results is presented in Table 1 with the identified themes and subthemes and participants' representative quotes.

(1) Acceptability Most participants considered Be a Mom Coping with Depression to be a well-structured intervention that is adequate for the difficulties presented during the postpartum period. All participants said that there was a good connection between the web-based program and the sessions with the psychologist. The biweekly frequency of the sessions with the psychologist was considered adequate by all participants. Most women thought that the number of sessions was adequate, although two participants (P1 and P6) said that it was too little.

The contents and exercises were described as useful and important to deal with the difficulties experienced. Some participants (P4, P5, and P6) referred to the additional readings as an important complement to the information presented on the modules. The participants reported some features that were attractive to them when enrolling in this intervention, namely, being part of a research project associated with a university, and the intervention being specifically designed for the postpartum period and having no associated costs.

(2) Usability of the Web-Based Program The design of the web-based program was described as attractive, interactive, accessible, funny, and professional. One participant (P5) considered the design to be childish. All participants, except for one (P5), found the language clear, simple, direct, and accessible. Most participants used the web-based program on their smartphones, and some used the computer. Two women reported some technical issues with some exercises or difficulties when visualizing the webpages on a smartphone. According to all participants, the navigation was easy, intuitive, and accessible. Concerning the extension of the online modules, two participants (P1 and P6) said that the modules were short and easy to complete, and one participant (P4) reported that the first two modules were extensive. Most participants reported the usefulness of the reminders both in engaging with the web-based program and in remembering the upcoming session with the psychologist, and they considered they had an adequate frequency.

(3) Effectiveness The intervention was generally perceived as useful, important, positive, and beneficial. Two participants (P1 and P6) also described the effect of completing the online modules—when not completing the modules, the participants described the negative effect it had on their next session, as well as the positive effect they felt when viewing the modules. All eight participants were able to identify strategies that they considered helpful and to recognize therapeutic gains that they obtained with this intervention. Learning how to deal with negative thoughts and emotions in a more adaptive way and increasing cognitive flexibility were the most common skills reported by the mothers, which included strategies of thought questioning, remembering positive experiences, thought defusion, and self-compassion. They also described having learned to understand their emotional difficulties, to deal with unrealistic expectations toward motherhood, to adopt more assertive communication, to increase social support, to set goals, and to identify their values and act in accordance with them. The normalization of difficulties experienced during the postpartum period was an important component of the intervention that was highlighted by five participants.

(4) Advantages Concerning the web-based program, the possibility to reflect previously to the session and to prepare for the next session with the psychologist was described. In fact, some participants reported that it was important to them to have time to think about the topics discussed both in the online modules and the sessions with the psychologist. The flexibility to complete the online modules at any time and any place, according to their availability, as well as the possibility to review the contents and to have the information aggregated in the same place was described by the participants as beneficial. Other participants said that having the exercises and information presented in the web-based program was helpful to understand the concepts and strategies. The sessions with the psychologist, according to the participants, allowed them to reinforce information and practice the learned strategies, to adapt the strategies to their individual needs, to explore personal issues, and to clarify any doubts. Some participants also said that this blended intervention contributed to the reduction of costs, reduction of travel (or no need to travel), and better

Table 1 Main themes, subthemes, and representative quotes from participants' interviews

Themes and subthemes	Representative quotes
Acceptability	
Structure	"What we were working on the modules, we worked on the next session, and there was always this connection." (P3) "I liked the fact that it was biweekly, I think it gives time to think and to use the strategies." (P5)
Duration	"I think it was the necessary number of sessions, because we also had the website plan." (P8) "The duration was good, they were not too long or too short. (…) although there were some sessions that were quite long, I think there was one or two that lasted two hours." (P6)
Contents and exercises	"I thought all contents were interesting and relevant." (P3) "I think the themes are appropriate for what a person usually goes through during this period." (P5)
Additional readings	"Then we had the reading guides, they are also important." (P4)
Attractive features	"Addressing postpartum depression and being a research project, and honestly, also having no associated costs." (P1) "I found the fact that it was something so specific for mothers in the postpartum period interesting." (P3)
Usability of the web-based program	
Design	"The program was interactive, appealing" (P1) "It was very nice, it looked very professional but also accessible." (P6)
Language	"I think it was clear; it was' very clear, direct, and easy to understand. It did not have very complex concepts or complex terms (…)." (P7)
Equipment used	"On the computer. Yes, everything was fine, there were no problems or configuration errors, in that aspect it worked very well." (P3)
Navigation	"Easy to use from the sign in to viewing the modules, the navigation, I found it easy." (P6)
Length of the modules	"The modules were not very long, they were not extensive. The fact that they were short is good, there was not a lot of text." (P6)
Reminders	"Sometimes I forgot to see the module, so I think it makes perfect sense. I do not think they were intrusive or whatever, I think they were useful for us to remember." (P3)
Effectiveness	
Utility	"I would describe it as a useful and important program (…) Essentially it would be a useful and important thing to help women dealing with this phase." (P3)

Table 1 (continued)

Themes and subthemes	Representative quotes
Perceived impact	"It has come to an end, and I feel much more stable." (P2) "I think I rediscovered myself. I learned to like my daughter, I learned to enjoy this role, I learned to enjoy life again." (P8)
Importance of the online modules	"It just did not work as well as it could have when I did not see the modules; I did not do the homework and the referral that could have been given in the consultations was slightly more limited." (P1)
Learned strategies and therapeutic gains	"I think the strategies I learned to deal with thoughts and emotions and to have more adequate communication." (P1) "To gain an awareness of certain aspects that I did not have, such as managing expectations, the importance of emotions and how emotions affect thoughts, that was truly important." (P2) "The question of values is very important; it is a topic that is fundamental." (P3)
Intention to practice	"I think there are exercises that I have to repeat with some regularity." (P1)
Generalization of gains	"Strategies were useful not only for the postpartum period but that will stay for the rest of my life." (P3) "It was very useful at this phase, but it also has a lot of utility and applicability in several other situations and that can be useful to me." (P7)
The role of normalization	"The fact that this is common to other people; other people also experience the same thing." (P2)
Advantages	
Advantages associated with the web-based program	"It was a way for me to think about things, and then in the next week we had the session and we reflected on the same theme." (P2) "At any time, if we were not well prepared or if we had any doubts, we could consult the previous modules." (P4)
Advantages associated with the sessions with the psychologist	"We explored the topics better, always according to my case, according to my situation and reality." (P2) "I had some difficulty in interpreting what I was supposed to do in some exercises on the website, but I clarified that with you in the sessions." (P7)

Table 1 (continued)

Themes and subthemes	Representative quotes
Advantages associated with the sessions through videocall	"For instance, the fact that it was online, I could drop the baby at the daycare which is 5 minutes from home, and I'm here in a moment; the session ended at 10 am and at 10:02 am I was working." (P3) "(…) having weekly sessions with a baby is very difficult and, in this way, it became more accessible, and in that the website helped a lot." (P5) "(…) in the videocall, since the other person was not present, maybe it was easier (…) not being ashamed (…). I think that for me, I felt freer to talk and especially about a topic that was so ugly in my head, which was not being happy to have my daughter, not loving my daughter. Maybe by being away from you it was a little easier to say it." (P8)
Disadvantages and difficulties	
Standardized program	"The order in which the modules are presented – the fact that it is fixed and that it is always in that same order. For me, for example, the part of communication and the marital relationship would make more sense at the beginning." (P2) "Sometimes I had difficulty fitting the modules with what I was feeling at the time, the question of its structure." (P3)
Structured sessions with psychologist	"I had the idea that the sessions would be for talking and it did not happen so much in the way of talking freely about things." (P1)
Need for commitment	"Sometimes the fact of being online can also create some neglect, we do not have that commitment as we do face-to-face." (P2) "It requires some commitment from us. (…) The disadvantage is that, in my case, for example, I ended up delaying it. When we have to complete the module online, there is no scheduled time for it, it is the advantage and disadvantage." (P3)
Completing the exercises	"Sometimes responding to exercises, it was not very easy to complete them. Not because they were complicated, it was because I did not know what to answer." (P2)
Difficulties associated with the online communication	"Maybe some people need to be in face-to-face contact with each other." (P4) "Well, if a person does not have an internet connection, it is slightly difficult, or if the connection is bad or if she doesn't know how to handle this [technology]." (P5)
Therapeutic relationship	
Communication and language	"I think the language was very accessible; there was never a moment when I could not understand what you were saying to me." (P8)

Table 1 (continued)

Themes and subthemes	Representative quotes
Empathic and nonjudgmental relationship	"I think we established a relationship of openness and trust and I feel free to talk to you and share things with you." (P3)
Availability and flexibility	"I scheduled and rescheduled the appointments a few times and that caused me a lot of stress, and you always made me feel comfortable with that." (P7)
Motivating and encouraging change	"You were always reinforcing 'You are doing a good job, it is going well, it was a great evolution'. For me it was really important." (P8)
Individual characteristics	
Motivation to participate	"I think it was very good for me to be able to identify if I really had a problem or if it was just a temporary mood." (P7) "I just needed help, I just wanted help." (P8)
Previous experience with psychotherapy	"For those who are more familiar with psychotherapy, it was very different from the usual." (P1)
Motivation and commitment	"It is really a matter of a person being available to be in front of the computer and saying 'this morning is really for this'. (…) We also need to have a little determination." (P4) "I often felt like giving up because it is easier (…). I think the ability to continue was the most difficult." (P8)
Availability	"The main issue was to continue to follow the program, at a certain point; I think it was when I started working. It became more difficult to dedicate the time to read the contents." (P1)
Emotional expression	"Maybe sometimes understanding what I was feeling and expressing it was the biggest difficulty." (P6)
Preferences	"Being face-to-face or online, for me it is even better to be like this [online]; it is a lot easier." (P4)
Stigma and professional help-seeking	"(…) because unfortunately we still have a bit of this stigma, don't we? To go to the psychologist, to enter the office and to speak" (P8)
Satisfaction	
Satisfaction with the intervention	"I loved it, I think it is super young, it is fresh." (P8)
Intention to use the web-based program again	"I will certainly not lose the password for this website because I want to go back there many times." (P7)
Intention to recommend the intervention	"I would recommend it. It has the additional readings, it has the complement of the online sessions, we have the human part of the sessions. I think I would simply recommend it." (P6)

time management. One participant (P5) said that the web-based program would have also contributed to these advantages even if the sessions with the psychologist were delivered face-to-face. Concerning the videocall format of the sessions, the participants said that it allowed for a better logistic organization related to their childcare or work and that it was easy to access the intervention (accessibility). Some women mentioned other advantages related to the reduction of stigma and disclosure of feelings.

(5) Disadvantages and Difficulties Four participants (P1, P2, P3, and P4) said that the intervention was highly structured and identified the standardized order of the online modules as a disadvantage. They reported that some of the topics could have been addressed earlier, according to their individual situation, and that sometimes they were not able to relate to certain themes. However, two other participants (P4 and P8) presented a different opinion and considered that the order of how the themes were presented made sense and was useful. Two participants (P1 and P3) felt that the sessions with the psychologist were too structured and focused on the themes that were the predefined for the sessions. Most participants recognized that engaging in the online session required commitment, and some participants reported feeling less commitment toward the web-based program compared to the sessions with the psychologist. Difficulty in understanding and completing the exercises of the web-based program was reported by three participants (P2, P4, and P7). Another participant (P6) said that it was difficult for her to use the strategies and practice the exercises when she was facing difficulties. Some participants reported possible disadvantages associated with communication through videocalls, namely, the possibility of affecting the establishment of the therapeutic relationship, the possibility of affecting the intervention's credibility, and a possible lack of privacy. Despite reporting these disadvantages, they said that these were not problems they experienced.

(6) Therapeutic Relationship Most participants considered that there was good communication with the psychologist and considered the language that was used to be accessible, clear, adequate, and simple. The participants reported feeling that the psychologist listened to them and showed interest in their difficulties, and empathy was a common characteristic in the participants' descriptions. Some participants (P2, P6, and P8) also reported that the psychologist guided them toward a certain result by promoting the use of certain strategies, reinforcing their achievements and motivating them to change.

(7) Individual Characteristics Some individual characteristics that can play an important role when engaging in the blended intervention were identified. Five women described the need for help as an important factor for participating in the intervention. The need to recognize their difficulties and deal with their depressive symptoms was reported by two other mothers (P1 and P7). Some participants (P1, P2, and P5) reported previous experience with psychotherapy and compared the blended intervention to their previous experiences. It was mentioned that this intervention required commitment and motivation, and three participants reported

Table 2 Participants' pre- and post-intervention assessments

	EPDS scores		RCI
	Pre	Post	
P1	23	8	−5.40
P2	19	8	−3.96
P3	17	14	−1.08
P4	19	18	−0.36
P5	18	8	−3.60
P6	17	22	1.80
P7	14	14	0
P8	20	7	−4.68
M (SD)	18.4 (2.62)	12.4 (5.55)	-

EPDS Edinburgh Postnatal Depression Scale, *Pre* pre-intervention scores, *Post* post-intervention scores, *RCI* Reliable Change Index scores

difficulty in managing their time availability. A common obstacle mentioned by half of the sample was the difficulty in emotional expression, i.e., to recognize and describe their thoughts and feelings during the sessions with the psychologist. Most women (six participants) demonstrated a preference for the videocall format. The stigma associated with psychological treatment or antidepressant medication use was described in the participants' reports (P4, P7, and P8), as well as the difficulty in asking for professional help (P3).

(8) Satisfaction Generally, the participants expressed feeling satisfied with their experience receiving the blended intervention or reported the intention to use the web-based program again in the future. All eight participants said they would recommend the intervention to a friend experiencing emotional difficulties during the postpartum period.

The participants made some suggestions for improvement of the blended intervention. Considering the standardized order of the online modules, participants P2, P3, and P5 suggested that the course of treatment could be flexible and adapted to each participant according to their individual needs. Participants P1 and P3 suggested, respectively, increasing the number of sessions and having some sessions with the psychologist to talk about other themes in a less structured way. Two other mothers (P2 and P8) considered that it would be useful to have a support group or chat with other women with PPD within the web-based program and to have videos with real clinical patients sharing their experiences.

Depressive Symptoms

The pre- and postintervention assessments are displayed in Table 2. In general, the levels of depressive symptoms decreased among the participants. Specifically, a

significant improvement in depressive symptoms was found in 4 out of the 8 participants, as informed by the RCI.

Discussion

This study presents the first known blended CBT intervention for PPD delivered to Portuguese mothers, and our findings support the feasibility and acceptability of Be a Mom Coping with Depression. This study also provided evidence to proceed with the conduction of a larger study to assess the efficacy of this new intervention and provided relevant information to perform the necessary changes.

In this study, the recruitment of participants was challenging, with only 6.1% of women being eligible. A considerable number of mothers who were screened for eligibility were uncontactable or did not want to proceed with their participation. We can hypothesize that the purpose of the study was not clear in the dissemination or that these mothers did not recognize their depressive symptoms and/or the need for psychological treatment. Knowledge-related barriers such as not knowing the effective treatment options or normalizing depressive symptoms (Daehn et al., 2022) could have prevented women to engage in the next phases of recruitment. Efforts to increase and clarify the dissemination of the study will be conducted in future RCT trial. Moreover, since a larger sample will be needed to assess the intervention's efficacy, the eligibility criteria will be changed for the further conduction of an RCT. In this study, a considerable number of participants did not meet the criteria for a major depressive episode according to the DSM-5, despite presenting depressive symptoms and emotional difficulties. Therefore, postpartum women presenting at least 4 symptoms for the clinical diagnosis of a major depressive episode according to the DSM-5 (and at least one of the symptoms should be either depressed mood or decreased interest or pleasure; American Psychiatric Association, 2013) will be eligible, as previously proposed by other authors (e.g., Topooco et al., 2019). This modification may increase the number of participants accessing and receiving the blended intervention, since we believe that these mothers can also benefit from this intervention.

Despite the difficulty to recruit participants, a low dropout rate was observed. In fact, only one participant did not complete the intervention. Other studies assessing the feasibility or effectiveness of blended interventions for depression have reported no dropouts (Nakao et al., 2018; Schuster et al., 2018a) or dropout rates ranging from 13% (Kemmeren et al., 2019) to 40% (Høifødt et al., 2013). It also seems that the dropout rates are similar when comparing blended CBT interventions to the traditional CBT (Mol et al., 2020). On the other hand, only web-based interventions for PPD revealed higher attrition rates that can range from than 60 to 86% (Branquinho et al., 2021; Mu et al., 2021), revealing that retention rates are higher when there is therapist support available in the intervention (Urech et al., 2018; Wentzel et al., 2016). The participants' engagement in sessions with the psychologist and online sessions was also high. However, some participants did not complete all the exercises proposed in the web-based program. The qualitative findings showed that

women in our sample reported not understanding some online exercises and found it more difficult to engage with the modules. In fact, other studies reported higher adherence to the face-to-face sessions when compared to the online components (Høifødt et al., 2013; Schuster et al., 2019), and one study reported a decrease of engagement with the module throughout treatment (Schuster et al., 2018a). These difficulties can be addressed by the psychologist in-session by explaining the exercises that will be found in the upcoming module and the importance of completing them to obtain clinical improvements. Moreover, strategies to increase the participants' involvement with the online sessions were implemented (e.g., email reminders and phone calls) and were considered acceptable and adequate by the sample. Other strategies to increase engagement with the web-based program (e.g., sending reminder messages and establishing a schedule to complete the online sessions) can be further included (Ebert et al., 2018).

Adherence to the therapist manual was high, although the expected time for the sessions with the psychologist was not accomplished. In fact, some sessions included several topics to be addressed, which may have contributed to their increased duration. This supports the need to review the therapist manual and the contents addressed in each session for the conduction of an RCT to mitigate the time constraints observed in this feasibility study. This seems to be a concern among therapists who have doubts if a blended format contributes to decrease treatment duration or if it is more time-consuming than face-to-face CBT (Cerga-Pashoja et al., 2020; Mol et al., 2020; Schuster et al., 2019). For instance, it may require time for the therapist to learn how to use the web-based program and to effectively deliver this new treatment format (Mol et al., 2020). On the other hand, there is some evidence that blended treatments could also reduce therapists' time by 50 to 86% without compromising efficacy (Ebert et al., 2018) and that, when comparing to standard CBT, blended CBT can decrease the number of face-to-face sessions with the therapist (Kooistra et al., 2019), but more research is warranted.

In terms of acceptability, usability, and satisfaction, the results seem promising. Be a Mom Coping with Depression was found to be an acceptable and useful intervention for PPD, and the participants presented a general positive opinion about the intervention's structure, duration, contents, and relevance. Some technical issues were identified when viewing the online sessions on a smartphone, which will be adjusted. Overall, the participants were satisfied with this blended intervention. Consistent with prior studies (Branquinho et al., 2021; Schuster et al., 2018b; Urech et al., 2018; Wentzel et al., 2016), the participants reported several advantages of this blended intervention for PPD, including the possibility to address individual questions, to clarify doubts and to have personal guidance. Previous studies also described the potential of blended interventions for increasing patient involvement and motivation when compared to web-based interventions without therapist support (Titzler et al., 2018). In fact, in this study, some participants said that the therapist was able to motivate and encourage them in practicing therapeutic strategies. Similarly, in Wilhelmsen et al. (2013), some participants receiving a blended intervention for depression mentioned that the face-to-face sessions were important to motivate them and that this was a necessary component to engage in the treatment,

which highlights the importance of human support and therapeutic relationship in a blended intervention (Ebert et al., 2018; Wilhelmsen et al., 2013).

The sessions with the psychologist were delivered through videocalls, which revealed to be a more accessible and feasible delivery format for our sample, given the benefits reported by them (e.g., better time management and fewer logistical difficulties related to their baby). Then, it is possible that this blended intervention can be a more accessible treatment option that meets women's needs and preferences. These advantages seem to be more even relevant during the COVID-19 pandemic given the restrictions that were imposed during the study onset (e.g., quarantine measures and unavailability of services; Motrico et al., 2020). A blended intervention may also contribute to reducing the stigma associated with PPD treatment, which usually hinders postpartum women's help-seeking (Bina, 2020). Incorporating a web-based program in a treatment for PPD can have an important role in the normalization of patients' difficulties because they may recognize that the contents were developed for many people who experience the same condition (Wilhelmsen et al., 2013). In this study, some participants said that it was easier to share their emotional difficulties by videocall because they felt less shame. In fact, "using technologies may reduce the impact of shame on treatment utilization" (Ebert et al., 2018, p. 169). Concerning the therapeutic relationship, Vernmark et al. (2019) found that the therapist alliance was scored as high by patients in a blended treatment for depression and that those ratings were comparable to those of face-to-face interventions. Similarly, the participants in our sample considered having established a good therapeutic relationship and reported a concern associated with the videocall format and not the blended format itself. The participants made some considerations about patient-therapist communication, such as the possible lack of privacy or credibility, which have also been described in the literature (Mohr et al., 2013). These concerns can be discussed with patients in the first session, reinforcing that it has been shown that the therapeutic relationship can be equally strong in a therapy that is delivered through videocall (Simpson & Reid, 2014) and developing possible solutions to decrease the impact of other barriers (e.g., to address the concern about the lack of privacy and finding a quiet space). Given the inherent challenges to the postpartum period and that the participants demonstrated a preference for the videocall format, we decided to maintain the sessions with the psychologist in this format in the upcoming RCT.

Despite the perceived advantages of this blended intervention, some participants found it highly structured and suggested that it could be more flexible. In some studies (e.g., Kemmeren et al., 2019; Titzler et al., 2022), the blended interventions were tailored over the treatment course, giving the possibility to choose the order of modules according to a patient's preference or a clinician's evaluation. However, this possibility may add more heterogeneity to an efficacy study and heterogeneity between participants. In the study conducted by Kemmeren et al. (2019), the option to customize treatment contributed to a larger variability in patterns of usage. On the other hand, most blended interventions follow a structured protocol, and all participants have the same order of online and face-to-face sessions (e.g., Kooistra et al., 2019; Nakao et al., 2018; Schuster et al., 2018a). For these reasons, our intervention was developed to be provided in a standardized order based on prior literature

and evidence of interventions conducted in different formats (blended, online, or in person). Therefore, we will opt to maintain the standardized order in the implementation of the RCT, explaining the relevance of addressing the contents from an individual level (sessions 1 to 7) to interpersonal contexts (sessions 8 to 11) to women. However, we recognize the relevance of delivering a tailored and patient-centered treatment, which could be further studied after assessing the potential efficacy of this blended intervention in its current format.

Although no conclusions can be drawn on the efficacy of the intervention based on this study, the results are promising for the potential benefits in reducing depressive symptoms, which is consistent with the results reported in other studies of blended interventions for depression (Høifødt et al., 2013; Kooistra et al., 2019). Participants in our sample also reported, by the end of the intervention, that they acquired several skills and obtained therapeutic changes. It is interesting that patients receiving blended treatment seem to attribute therapeutic gains to themselves in a higher level than in standard treatment (Mol et al., 2020). In our sample, participants reported that they were more prepared for the sessions with the psychologist after completing the online sessions and recognized the negative effects when they did not do it. So, the online sessions may increase the patients' self-management and perception of active role in treatment and in their progress (Schuster et al., 2017), which could be further explored in future studies.

Limitations and Strengths

This study has some limitations that need to be considered, including the small sample size, and therefore, our findings cannot be generalized to the general population. Since this was a feasibility study with a single-arm design and no control group, it did not allow us to evaluate the clinical efficacy of the blended intervention, which will be further evaluated in the RCT. No follow-up assessments were conducted, so it was not possible to draw conclusions on the long-term maintenance of the intervention's effects. The recruitment through online platforms produced a self-selected and possibly biased sample, because women could have higher technology literacy and be more willing to receive this type of intervention. The qualitative outcomes (the participants' answers to interview questions) could have been influenced by the presence of the interviewer, who was the psychologist conducting the blended intervention, and then producing a social desirability bias. Moreover, the interviewer's own beliefs toward the intervention may influence the interpretation of results and the timing of the interview (only one week after the end of the intervention). Finally, variables related to the COVID-19 pandemic (e.g., infection with COVID-19) were not assessed and could have been important to characterize our sample.

Despite these limitations, the present study has several strengths. It collected both quantitative and qualitative evidence, which is in accordance with recent recommendations of including qualitative methods in feasibility studies to assess acceptability and discuss barriers and facilitators to treatment (Gadke et al., 2021; Sekhon et al., 2017). Second, the development of this blended intervention involved the target population at different stages (development and evaluation) and using different

methods (e.g., questionnaires and interviews) following a patient-centered approach, which is an established practice in the development of e-health interventions (Kip et al., 2022). Finally, this study adds important contributions to the current state-of-art on blended interventions for mental health problems, as it adds new evidence that this format can also be feasible and applicable to PPD treatment. By providing an alternative format to the existing treatment options, this blended intervention can potentially increase postpartum women's access to effective mental health care. The results of this study also inform the further improvement of the Be a Mom Coping with Depression intervention and supports the conduction of an RCT considering the issues previously discussed.

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Declarations

Conflict of Interest The authors declare no competing interests.

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