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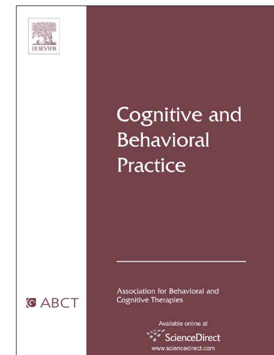

Be a Mom: Formative Evaluation of a Web-Based Psychological Intervention to Prevent Postpartum Depression

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Be a Mom: Formative Evaluation of a Web-Based Psychological Intervention to Prevent Postpartum Depression

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Abstract

A formative evaluation (consisting of two phases: a scoping literature review and a focus group with mental health professionals) was conducted to inform the design of a web-based intervention to prevent postpartum depression, in terms of its characteristics and content: the *Be a Mom* program. The results showed that the web-based intervention should be short-term, delivered postnatally, and grounded in cognitive-behavior therapy principles. Moreover, the intervention should include weekly sessions targeting basic contents: motherhood changes, reorganizations and emotional experience; cognitions, self-criticism, and self-compassion; parenting values, social support, and assertive communication skills; couple relationship, negotiation and conflict resolution skills; and postpartum depression signs and professional help-seeking. These results may improve the Be a Mom's adequacy, implementation success, and effectiveness.

Keywords: cognitive behavioral therapy; formative evaluation; postpartum depression; prevention; web-based intervention

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Postpartum depression (PPD) is a worldwide, prevalent clinical condition (Gaynes et al., 2005), with well-documented adverse effects for maternal health (Muzik & Borovska, 2010) and impairments to infants' development (Field, Diego, & Hernandez-Reif, 2006; Kingston, Tough, & Whitfield, 2012) and mother-child interactions (Tronick & Reck, 2009). Several factors make PPD a feasible target for preventive efforts: its beginning is preceded by a clear event (childbirth), and there is a defined period of increased risk of incidence (the first 3 to 4 months postpartum); a "high-risk" group of women can be identified because there are well-known and measurable risk factors; and pregnant and postpartum women have increased contact with health professionals (Battle & Zlotnick, 2005; Pope, 2000), which makes this period an opportunity to implement preventive approaches.

Existing Preventive Interventions for PPD: What Do We Already Know?

Preventive interventions for PPD are psychosocial interventions introduced during pregnancy or in the early postpartum period (Stuart, O'Hara, & Gorman, 2003) with the aim of preventing the occurrence of postpartum depressive symptoms. Although several preventive interventions for PPD have been developed, existing reviews present contradictory findings concerning their efficacy (Dennis, 2004; Dennis & Creedy, 2004). These differences may be due to the high variability of the interventions across a number of dimensions, including the target population (universal *vs.* indicative/selected), the type of intervention provided (e.g., psychoeducation *vs.* psychotherapy) and the theoretical approach to treatment, the timing of the intervention (e.g., prenatal *vs.* postnatal), the modality of delivery (e.g., group *vs.* individual), the number of sessions, and the professional qualifications and level of training of

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interveners (Stuart et al., 2003; Werner, Miller, Osborne, Kuzava, & Monk, 2015). In a recent meta-analysis, Sockol, Epperson, and Barber (2013) found that preventive interventions result in a small but significant reduction in depressive symptoms and in the prevalence of depressive disorders during the postpartum period, although these effects are modest when compared to PPD treatments.

Review studies and meta-analyses have identified a set of characteristics that enhance the effectiveness of preventive interventions for PPD. First, there is evidence that the effects may be more robust if interventions target at-risk women rather than women from the general population (Clatworthy, 2012; Dennis & Creedy, 2004; Stuart et al., 2003; Werner et al., 2015). Second, there is evidence of greater effectiveness of individual-level preventive interventions for PPD (Dennis & Creedy, 2004), although group interventions are also effective and may be preferred by the target population (Sockol, 2015). Third, interventions initiated during the postpartum period seem to be more effective because women find the information immediately relevant and helpful (Dennis & Creedy, 2004; Sockol, 2015). Fourth, greater treatment length is associated with poor efficacy results (Sockol et al., 2013), suggesting a focus on short-term preventive interventions. Fifth, there is evidence of greater effectiveness of preventive interventions developed on the basis of psychological therapy models (Clatworthy, 2012; Sockol, 2015; Werner et al., 2015).

Cognitive behavior therapy (CBT) and Interpersonal Psychotherapy (IPT), both short-term psychotherapies, have been considered effective in the prevention and treatment of PPD (Claridge, 2014; Sockol, 2015). CBT aims to address dysfunctional patterns of cognitions and maladaptive behaviors (Beck, 1995; Butler, Chapman, Forman, & Beck, 2006). There is evidence that CBT for PPD should include perinatal-specific concerns (e.g., culturally endorsed beliefs about motherhood, the impact of

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pregnancy and of a new infant on a woman's identity, and the ability to sustain and engage in previously valued and meaningful activities) and interpersonal domains (e.g., improving appropriate social support; O'Mahen et al., 2012). Recent developments in CBT treatment for depression have also highlighted the role of third-wave CBT approaches, such as Acceptance and Commitment Therapy (ACT; e.g., Hayes, Luoma, Bond, Masuda, & Lillis, 2006) and Compassion-Focused Therapy (CFT; Gilbert, 2009). However, these approaches have been seldom investigated with regard to the prevention and treatment of PPD (Cree, 2015; Klausen, 2005).

Preventing PPD: Are Web-Based Approaches a Means of Overcoming the Treatment Gap?

Research has consistently identified a number of barriers that prevent women from seeking mental health interventions during the perinatal period, namely, knowledge (e.g., poor depression literacy), attitudinal barriers (e.g., stigma), and practical barriers (e.g., women's financial difficulties and work constraints; Fonseca, Gorayeb, & Canavarro, 2015; O'Mahen & Flynn, 2008). Therefore, the use of information and communication technologies to deliver psychological interventions to prevent and treat PPD (web-based interventions) may be an effective way to improve women's accessibility and use of mental health care as well as its outcomes (Barrera & Nichols, 2015; Fotheringham, Owies, Leslie, & Owen, 2000).

There is considerable support for the use of the Internet for delivering evidence-based psychotherapy for common mental disorders (e.g., Cowpertwait & Clarke, 2013; Cuijpers, van Straten, & Andersson, 2008). Web-based interventions have associated advantages, such as improved access to evidence-based treatments (e.g., allows patient's self-referral), flexibility (no travel or time constraints), adjustment to individual needs,

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privacy (reducing feelings of stigma and shame) and ease of use (interactivity and visual and graphics interfaces that facilitate the transmission of information). The implementation of web-based interventions also seem to be cost-effective when compared to face-to-face treatments, and allows the continuous monitoring of the patients' progress (Andersson & Titov, 2014; Lal & Adair, 2014). However, there are also some important questions that should be acknowledged related to Internet-based assessment and diagnosis (e.g., security issues concerning data storage and data collection methods, difficulties in checking information accuracy and obtaining additional information that may limit the diagnosis of the patients) and with therapeutic issues (e.g., the role of a therapist vs. unguided treatments and its effects on adherence to treatment and treatment outcomes). Moreover, there is limited knowledge about the characteristics that determine which patients are more suitable and benefit more from web-based interventions (Anderson & Titov, 2014). Additionally, there are concerns related to its poor implementation and low adoption rates, as the use of web-based interventions may be dependent on several nonspecific intervention factors (e.g., individuals' prior experiences with e-health interventions; Musiat, Goldstone, & Tarrier, 2014).

Some web-based interventions to prevent (Barrera, Wickham, & Munoz, 2015; Haga, Drozd, Brendryen, & Slinning, 2013) or treat PPD (Danaher et al., 2013; O'Mahen et al., 2013) have been recently developed in several countries (e.g., Norway, United Kingdom, United States, Australia). Web-based interventions designed to treat PPD were found to be effective in reducing the proportion of women who met the diagnosis criteria for PPD (Milgrom et al., 2016; O'Mahen et al., 2014). On the other hand, existing web-based preventive interventions for PPD are grounded in different psychotherapeutic models, such as Positive Psychology and Metacognitive Therapy

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(Haga et al., 2013) and CBT (Barrera et al., 2015), and differ in terms of the timing of delivery (e.g., prenatal *vs.* pre- and postnatal) and the duration of the intervention (8 and 44 sessions, respectively). While the effectiveness of Mamma Mia (Haga et al., 2013) is still being investigated, the study of Barrera et al. (2015) failed to demonstrate the effectiveness of the Mothers and Babies program. However, the characteristics of these interventions (e.g., timing of delivery, duration of the intervention) are not in line with prior research demonstrating the greater effectiveness of short-term postnatal preventive interventions for PPD (Sockol, 2015; Sockol et al., 2013). Furthermore, these interventions did not incorporate recent developments in CBT-treatment for depression. Therefore, further research is needed to develop effective web-based interventions to prevent PPD.

The Present Study

The current research aimed to describe the iterative process of formative evaluation leading to the development of a web-based intervention to prevent PPD. Existing frameworks for the development of complex interventions (Stage Model of Behavioral Therapies Research; Rounsaville, Carroll, & Onken, 2001) emphasize the importance of the early phases of developing an intervention, by suggesting the need for a formative evaluation process. Formative evaluation includes a set of evaluative activities undertaken during the design and pretesting of programs to guide the design process (Rossi & Freeman, 1993; Worthen, Sanders, & Fitzpatrick, 1997), and to allow the identification of intervention components and of its interrelationships.

The current formative evaluation process is an adaptation of Stage I of the Stage Model of Behavioral Therapies Research (Rounsaville et al., 2001), following the methodological recommendations for the development of web-based behavioral

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interventions (Danaher & Seeley, 2009; Eng, Gustafson, Henderson, Jimison, & Patrick, 1999), and includes two phases, both aiming to inform the development of the web-based intervention to prevent PPD by: (a) identifying the main characteristics and therapeutic goals of existing preventive interventions for PPD (scoping literature review, Phase 1); and (b) by identifying the perceived needs of the stakeholders considering preventive interventions for PPD (focus group with mental health professionals working with the target population, Phase 2). By adopting an explanatory sequential design, we resort to a qualitative data collection phase, in which we will build up from the results of the scoping review to integrate the significant experience of mental health professionals working with the target population (women in the perinatal period).

Phase 1

Aim

Despite existing research on the effectiveness of interventions aiming to prevent PPD (Dennis & Creedy, 2004; Sockol, 2015; Sockol et al., 2013), information concerning the therapeutic goals addressed in preventive approaches for PPD is scarce. However, this knowledge may offer an opportunity for reflection on the effective treatment goals and content that preventive interventions for PPD should include. Therefore, the goal of this scoping review was to identify the therapeutic goals included in preventive interventions for PPD and to identify the intervention characteristics that may prompt the effectiveness of preventive approaches for PPD.

Method

Search Procedures and Selection of Studies

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Relevant studies were identified through a systematic search in four electronic databases: PubMed, Ovid, Proquest, and B-ON. The search was conducted independently by two researchers, was started in January 2015 and completed in April 2015. Combinations of the following keywords were searched: (a) “postnatal depression,” “postpartum depression,” “perinatal depression”; and (b) “preventive interventions.” Search was limited to peer-reviewed, published, English-language references, describing empirical quantitative studies focusing on preventive interventions for PPD. No timeframe restriction was considered in literature search.

To be included in the review, studies had to meet the following inclusion criteria: (a) a focus on preventive interventions for PPD (interventions designed to treat PPD were excluded); (b) the intervention was designed with the primary aim of preventing PPD symptoms or postpartum major depressive episodes (interventions that did not explicitly target depressive symptoms were excluded); (c) the preventive interventions should include a psychotherapeutic component (at least one individual or group session with a therapist or trained facilitator); and (d) the study design should include an assessment of the intervention efficacy (controlled trials [CT] and [pragmatic] randomized controlled trials [P]RCT).

The titles and abstracts of all retrieved records were screened by the first author to identify papers that met the inclusion criteria and to decide whether to obtain the full text. Papers that appeared to be relevant to this review were obtained and considered in relation to the review selection criteria. The reference lists of existing meta-analyses, relevant reviews, and retrieved articles were also inspected for further inclusion of relevant studies in this review.

Data Extraction

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A data collection form was developed by the authors for this review and was completed for each study that met the inclusion criteria. Information was extracted based on the following: publication information (i.e., authors, year, country); target group (universal; selective/indicated); timing of delivery (prenatal; postnatal; Pre+Pos); administration method (individual; group; Ind+Group); intervention type (psychoeducational; psychotherapy) and therapeutic orientation (CBT; IPT; CBT/IPT; other); number of sessions; intervention facilitator (mental health specialist; non–mental health specialist; both); trial type (RCT; PRCT; CT), control type, and sample size; and main results. With regard to therapeutic goals, the first author conducted an initial overview of the papers included in the review to identify relevant therapeutic goals and examined relevant literature concerning preventive interventions for depression, from which a categorization proposal of the different therapeutic goals was developed. The initial proposal was reviewed and discussed with two researchers with experience in the field, leading to a final categorization of 20 specific therapeutic goals. Two researchers independently read all the papers and categorized the preventive interventions according to the selected criteria. When divergences occurred in categorization, they were discussed between the researchers and resolved by consensus.

Results

The literature search identified 1,327 papers, of which 54 articles were selected for full-text eligibility assessment. After full-text review, a total of 29 interventions met all inclusion criteria and were included in the review.

Intervention Characteristics

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Table 1 presents an overview of the characteristics of the identified studies. With regard to the intervention characteristics, most preventive interventions for PPD had a selective/indicated approach (n = 19, 65.5% *vs.* universal approach: n = 10, 34.5%), were applied during the prenatal period (n = 14, 48.3% *vs.* postnatal period: n = 7, 24.1% *vs.* Pre+Pos: n = 9, 27.6%) and were administered in a group format (n = 12, 41.4%). The interventions had a median length of 5 sessions (min-max: 1-16 sessions; 9 interventions included booster sessions). Less than half of the selected preventive interventions were delivered exclusively by mental health specialists (n = 12, 41.4%). The majority of preventive interventions had a therapeutic approach (n = 21, 72.4%, mainly CBT).

Eleven studies (37.1%) provided evidence of the intervention's efficacy in preventing PPD (Chabrol et al., 2002; Cho, Kwon, & Lee, 2008; Gao, Chan, & Sun, 2012; Grote et al., 2009; Ho et al., 2009; Kozinsky et al., 2012; Mao, Li, Chiu, Chan, & Chen, 2012; Milgrom, Schembri, Ericksen, Ross, & Gemmill, 2011; Perez-Blasco, Viguer, & Rodrigo, 2013; Wiklund, Mohlkert, & Edman, 2010; Zlotnick, Miller, Pearlstein, Howard, & Sweeney, 2006), at least in the short term, whereas 11 other studies provided only moderate evidence of the intervention's effectiveness in preventing PPD (Anton & David, 2015; Bernard et al., 2011; Crockett, Zlotnick, Davis, Payne, & Washington, 2008; Elliott, Leverton, Sanjack, & Turner, 2000; Kumar, 1998; Lara, Navarro, & Navarrete, 2010; Le, Perry, & Stuart, 2011; Matthey, Kavanagh, Howie, Barnett, & Charles, 2004; Ngai, Chan, & Ip, 2009; Silverstein et al., 2011; Tandon, Leis, Mendelson, Perry, & Kemp, 2014). The remaining 7 studies provided no evidence of the intervention's effectiveness in preventing PPD.

Most of the effective interventions for preventing PPD used a selective/indicative approach (54.5% *vs.* 72.2% in moderately/noneffective

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interventions) and were delivered individually (54.5% *vs.* 16.7% in moderately/noneffective interventions) and in the postnatal period or in both pre- and postnatal periods (63.7% *vs.* 44.5% in moderately/noneffective interventions). Moreover, the majority of effective interventions used a therapeutic approach (90.9% *vs.* 61.1% in moderately/noneffective interventions) and were mostly provided by mental health specialists (54.5% *vs.* 33.3% in moderately/noneffective interventions).

Intervention Goals

Figure 1 presents the proportion of specific therapeutic goals included in the various preventive interventions for PPD. Based on their thematic content, we grouped the intervention's therapeutic goals into four different areas: education and skills about the transition to parenthood, which targeted normative changes and transitions within this life period; education about PPD and skills to address depressive and anxiety symptoms, which focused on the traditional goals of preventive interventions for depression; promotion of social support and of couple's relationship quality, which addressed interpersonal relationships, a prominent area in the transition to parenthood; and stigma, help-seeking, and helping the family, which targeted the barriers and limitations of help-seeking for mental health problems during the perinatal period.

Education and skills about the transition to parenthood. The most frequent therapeutic goals addressed were related to women's education about the changes and reorganizations associated with the transition to parenthood, and the discussion of coping strategies to adequately address these new changes and responsibilities. Specifically, information and discussion were promoted about role transitions, changes and losses associated with the transition to parenthood (e.g., Chabrol et al., 2002; Ngai

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et al., 2009; Zlotnick et al., 2006), and women's emotional experience in the perinatal period (Brugha et al., 2000; Buist, Westley, & Hill, 1999; Hayes, Muller, & Bradley, 2001). Moreover, coping strategies were discussed to help women normalize and develop more constructive views of their negative feelings associated with motherhood (Hagan, Evans, & Pope, 2004; Matthey et al., 2004); to cope with uncertainty (Buist et al., 1999) and role transitions, by developing a more balanced perspective of new and old roles, accepting losses and dealing with ambivalence (Crockett et al., 2008; Stamp, Williams, & Crowther, 1995; Zlotnick et al., 2006); to develop skills to address the new tasks of caring for a newborn (e.g., Buist et al., 1999; Ngai et al., 2009); and to address unrealistic expectations about motherhood (Lara et al., 2010), which were often promoted by culturally reinforced myths about motherhood.

In this context, women's encouragement to share their emotional experience concerning the transition to parenthood with their social network was also a frequent therapeutic goal addressed in the context of preventive interventions for PPD because this may help women to normalize and validate their emotional experience (e.g., Brugha et al., 2000; Buist et al., 1999; Milgrom et al., 2011; Munoz et al., 2007). Moreover, the promotion of maternal confidence in caregiving tasks, particularly by providing women with information and opportunities to practice and acknowledging their progress in caregiving (e.g., Austin et al., 2008; Buist et al., 1999; Chabrol et al., 2002; Wiklund et al., 2010), was also addressed in the majority of preventive interventions for PPD.

Education about PPD and skills to address depressive and anxiety symptoms. Women's education about PPD (signs and symptoms, causes and risk factors, incidence and treatment options) was also a frequently targeted goal in preventive interventions (e.g., Crockett et al., 2008; Hagan et al., 2004; Hayes et al., 2001; Ho et al., 2009;

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Kozinsky et al., 2012), as was education about psychological functioning (i.e., how thoughts, emotions, and behaviors are interrelated; e.g., Brugha et al., 2000; Chabrol et al., 2002; Cho et al., 2008; Kozinsky et al., 2012; Milgrom et al., 2011; Munoz et al., 2007).

In addition, more than half of the interventions addressed specific goals associated with the development of stress and anxiety management skills (e.g., Austin et al., 2008; Crockett et al., 2008; Elliott et al., 2000; Kozinsky et al., 2012; Munoz et al., 2007; Perez-Blasco et al., 2013), namely, relaxation-skills training (Austin et al., 2008; Munoz et al., 2007) or mindfulness-based training (Perez-Blasco et al., 2013), and with the identification and modification of dysfunctional beliefs and thoughts (e.g., Brugha et al., 2000; Chabrol et al., 2002; Cho et al., 2008; Hagan et al., 2004; Milgrom et al., 2011; Munoz et al., 2007; Ngai et al., 2009; Tandon et al., 2014). Other goals that are characteristic of conventional preventive protocols for depression, such as promoting problem-solving and decision-making skills (e.g., Brugha et al., 2000; Kozinsky et al., 2012; Milgrom et al., 2011; Silverstein et al., 2011), promoting behavioral activation (Austin et al., 2008; Hagan et al., 2004; Munoz et al., 2007; Tandon et al., 2014), and promoting self-esteem and self-care (Chabrol et al., 2002; Elliott et al., 2000; Kozinsky et al., 2012; Lara et al., 2010), were included with less frequency in preventive interventions for PPD.

Promotion of social support and couple's relationship quality. Preventive interventions for PPD also address the importance of social support in women's lives during the transition to parenthood by employing strategies to reduce women's social isolation during this period and to identify sources of support and to activate practical and emotional support from women's social networks (Austin et al., 2008; Brugha et al.,

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2000; Chabrol et al., 2002; Crockett et al., 2008; Elliott et al., 2000; Kozinsky et al., 2012; Lara et al., 2010; Munoz et al., 2007; Stamp et al., 1995; Zlotnick et al., 2006).

However, few preventive interventions for PPD include therapeutic goals that target dyadic issues, such as promoting couple's satisfaction (e.g., Cho et al., 2008; Milgrom et al., 2011), communication and conflict-resolution skills (e.g., Chabrol et al., 2002; Cho et al., 2008; Crockett et al., 2008; Hagan et al., 2004; Milgrom et al., 2011; Zlotnick et al., 2006), and dyadic coping strategies in the transition to parenthood, by enabling couples to identify helpful and unhelpful strategies to address joint parenthood issues (e.g., Matthey et al., 2004) or by discussing the partner's role in the transition to parenthood (Kozinsky et al., 2012; Stamp et al., 1995).

Stigma, help seeking, and helping the family. Finally, few preventive interventions for PPD address therapeutic goals related to stigma reduction (e.g., Kumar, 1998; Munoz et al., 2007) and the development of a help-seeking plan in case of pervasive depressive disorders during the postpartum period (e.g., Hayes et al., 2001; Kumar, 1998). Moreover, few preventive interventions for PPD specifically address the woman's family (the partner or other family members) by providing them with education about PPD and coping strategies to address it (e.g., Brugha et al., 2000; Hayes et al., 2001; Stamp et al., 1995).

Phase 2

Aim

The aim of this phase was to identify the perceived needs of the stakeholders (mental health professionals) regarding preventive interventions for PPD. Specifically, we conducted a focus group with mental health professionals working with women in

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the perinatal period, with the aim of examining mental health professionals' perceptions about the most relevant characteristics and therapeutic goals/content that should be addressed in a web-based preventive intervention for PPD. The option for conducting a focus group with mental health professionals is justified by the fact that they share a framework on the psychotherapeutic process (e.g., concepts such as prevention, therapeutic goals, structure and content of therapeutic sessions) and simultaneously are aware of the needs of the target population (women in the perinatal period) and what may be more effective to them in terms of preventive efforts. The findings of the scoping literature review conducted on Phase 1 allowed us to set the stage for the discussion with the mental health professionals by helping us to systematically define the characteristics and therapeutic goals of existing PPD preventive interventions.

Method

Participants and Procedure

Data collection was conducted through a focus group with mental health professionals. Focus groups are commonly used as a form of qualitative research, and the participants' interactive discussion and reflection on the topics has been considered especially valuable for the exploration of complex issues (Morgan, 1996; Robinson, 1999). Existing guidelines were taken into account in the development of the focus group procedures (Krueger & Casey, 2009).

The participants of the focus group were six mental health professionals (clinical psychologists) of the central region of Portugal who were working in perinatal mental health. All the participants were women, and the mean age of the participants was 34.83 years (*SD* = 9.39, range = 25–49). Half of the participants (*n* = 3) had a graduate degree in Clinical and Health Psychology (*n* = 3) and the other half (*n* = 3) had a Ph.D. in

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Clinical Psychology. All the participants have a training background in CBT. On average, the participants had 8.92 years (*SD* = 6.59, range = 2–18) of experience working with the perinatal mental health population.

The focus group session lasted approximately 1.5 hours and was conducted in a conference room at Maternity Daniel de Matos of Centro Hospitalar e Universitário de Coimbra, EPE, which presented good conditions to promote the participants' interaction (e.g., sound isolation, chairs placed in a circle). The focus group was facilitated by the first author and assisted by two additional research assistants who were responsible for audio recording and registration of nonverbal aspects. The focus group facilitator gave the participants information about ethical issues (e.g., confidentiality and anonymity of data) and about the study's goals. All participants gave their consent to participate in the focus group and approved the recording of the session.

In the initial part of the focus group session, an overview of the main findings of the literature review was provided. Specifically, information was provided concerning the existing literature about PPD prevention, the characteristics of preventive interventions for PPD that have been found to be effective, and the therapeutic goals addressed in these interventions. After the presentation, the participants were asked a series of questions designed to elicit opinions and promote the discussions between the group members. The script of the focus group (cf. Measures) was designed to include general questions that allow the participants to comment on the existing findings but also to provide additional information and divergent opinions. At the end of the focus group, the facilitator asked the participants to complete a sociodemographic form.

Measures

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The script for the focus group discussion was developed by the project researchers. The script began with general questions about preventive interventions for PPD ("*What is your opinion about preventive approaches for PPD?" "What are the main topics/issues that a preventive intervention for PPD should address?*"), followed by specific questions designed to elicit discussion on the intervention characteristics (e.g., "*Based on your experience with the target population…: [a] do you consider that the intervention should be universal or selective?"; [b] what should the structure of the web-based intervention be?; [c] what should the structure be for each session?*) and therapeutic goals (e.g., "*Based on your experience with the target population, which therapeutic goals should be addressed as a priority*?"; "*Are there therapeutic goals that were not addressed or were rarely addressed in existing preventive interventions for PPD that should be included*?", "*Which additional components may be particularly important in preventing PPD?*"; "*Based on your experience, what is the most appropriate sequence to address the different goals?*"). Finally, the participants had the opportunity to make final comments regarding the topics discussed during the focus group. The sociodemographic form asked for information about gender, age, education level, and number of years working as mental health professional in the perinatal field.

Data Analysis

Data analysis was conducted using thematic analysis, which is a method of identifying, analyzing, and reporting patterns (themes) within the data (Braun & Clarke, 2006). A semantic approach was used in the thematic analysis, in which the themes are identified within the explicit meanings of the data (Braun & Clarke, 2006). Data analysis was assisted by the software QSR NVivo 11.

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First, the audio-recordings of the focus group were textually transcribed (verbatim), and the transcripts were analyzed with regard to suitability for the data analyses (Blomberg & Volpe, 2008). All participants' discourses were transcribed anonymously. Following the phases of thematic analysis (Braun & Clarke, 2006), each session's transcripts were initially reviewed by research team members to identify patterns of meaning and themes of potential interest in the data, with particular emphasis on intervention characteristics and therapeutic goals/content. After the researchers were familiar with the data, initial codes were generated (relevant blocks of text were given a code reflecting the original statement as closely as possible) by the first author. The initial coding system was constantly revised in the course of the analysis. Data codification was systematically reviewed and discussed with other independent encoder (the second author). Doubts and disagreements were resolved through joint discussion to achieve consensus.

When all data were initially coded, the codes were mapped and synthesized to create categories and subcategories until relevant themes were identified (a theme represents some level of patterned response or meaning within the data set; Braun & Clarke, 2006). Finally, the themes were defined and reviewed in relation to the coded extracts and the entire data set, generating a thematic map of the analysis (Braun & Clarke, 2006). The most illustrative expressions of mental health professionals' perceptions concerning the different themes were selected for presentation within this manuscript. Moreover, the frequency of participants' responses for each theme was ascertained (number of references).

Results

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Figure 2 presents the themes discussed by the participants when they were questioned about the development of a web-based intervention to prevent PPD. Table 2 presents a representative excerpt of each theme as well as the total number of references. Three major themes were identified: PPD prevention, Intervention characteristics and Intervention dissemination.

PPD prevention

The participants discussed some general themes related to PPD prevention: Risk & protection [26], Relevance/appropriateness [7] and Risk assessment [6].

The participants noted that preventive approaches for PPD should not only target modifiable risk factors but should also focus on the promotion of skills and protective factors to promote women's adaptation to parenthood (Risk & Protection). Furthermore, the participants reported that PPD is an appropriate condition for preventive approaches and highlighted its relevance, not only because it is possible to identify women at an increased risk of developing PPD but also because these interventions may target skills that may help most women to address common difficulties during the transition to parenthood. Congruently, the participants also emphasized the importance of risk assessment in the implementation of preventive approaches for PPD.

Intervention Characteristics

With regard to intervention characteristics, four major themes emerged. We began by presenting the themes referring to more general intervention characteristics of the web-based intervention (general intervention characteristics and characteristics that promote user's adherence), followed by formal intervention characteristics (related to its structure and organization) and, last, the goals and content of the intervention.

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General Intervention Characteristics

Within this topic, three themes emerged: Intervention timing [22], Target population [9], and Strong theoretical background [3]. With respect to intervention timing, the majority of participants stated that the intervention should occur in the postpartum period, although some participants also suggested that some issues may benefit from being discussed during pregnancy. Regarding the target population, the participants reported that the web-based intervention should be universally directed to all women in the postpartum period, although it may include specific content exclusively directed to high-risk women.

Finally, the participants discussed the theoretical background that should be adopted in preventive interventions for PPD. Specifically, the participants stated that CBT is a solid framework to guide intervention design and that third-wave CBT approaches should also be included.

Users' Adherence

Three different themes emerged concerning the web-based intervention characteristics that promote user's adherence, each with different categories: Interaction with users (including Reminders [10], Chats/forums [8], and Emails [7]), Tailoring (including Customized content [9], Personalized feedback [8], and Interactivity [5]), and Humanization (including Human faces [8], Relationship [7], and Personal stories [4]).

Interaction with users. The participants indicated the parsimonious use of reminders as a useful means of interacting with users between sessions. Moreover, the participants noted the importance of providing an email contact to allow asynchronous

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contact between users and the health professionals responsible for the web-based intervention. Conversely, participants reported that the inclusion of forums or webchats in the web-based intervention would be an acceptable option only if they were moderated by health professionals, which would imply additional human resources.

Tailoring. The participants also reported that users should feel that the web-based intervention targets their specific needs and, despite following a prespecified structure, is personalized to each user's situation. Specifically, the participants suggested that the content of the web-based intervention should be customized to the user's needs by including general topics available to all users, as well as specific content targeting users who face specific difficulties during the postpartum period. Moreover, participants suggested the important role of features such as personalized feedback (e.g., feedback dependent upon users' answers to the exercises) and interactivity (e.g., interactive exercises).

Humanization. The participants highlighted the important role of engaging users with the intervention by providing the web-based intervention with features that may promote a relationship similar to the therapeutic relationship in face-to-face treatments. Specifically, participants suggested the presence of some human elements, such as the exemplification of some of the content covered within the sessions by including personal stories and the existence of human faces (i.e., therapists) that may convey important messages.

Formal Characteristics

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Four themes emerged concerning the formal characteristics of the intervention: Session assessment [14], Session schedule [12], Session structure [4] and Continuity between sessions [2].

Regarding the session assessment, the participants indicated that it should focus on the perceived satisfaction and usefulness of the content and not on the knowledge acquired during the session. Moreover, the participants suggested that despite a recommended weekly schedule, users should be given the possibility to self-regulate with regard to the frequency of attending sessions. Participants also reported that the following session should only be available after the last session was completed by the users, which they may review if desired. Furthermore, the participants suggested that each session should have a specific thematic content and should follow a specified structure, beginning with a review of the previous week (e.g., homework practice) followed by the presentation of the session's content (using text, images, videos) and interactive exercises that allow the women to practice specific content, and ending with a summary and homework to practice within the next week. Continuity between sessions should be guaranteed not only through homework practice (exercises to complete during the week) but also by reviewing the prior week at the beginning of each session.

Goals and Content

Within this topic, six main themes emerged, presented in descending order of the number of references: content organization, interpersonal relationships, traditional stress and depression management, changes and reorganizations, signs and symptoms of PPD and help-seeking, cognitions and emotions.

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Content organization. With respect to the organization of the content of the web-based intervention, four themes were discussed: Thematic content [23], Thematic organization [18], Cognitive-behavioral therapy principles [7], and Extra information [7].

Concerning thematic content, the participants indicated that each session should address major processes (e.g., cognitive functioning, emotional regulation, interpersonal functioning) instead of specific thematic content (e.g., infant care, family of origin). Specifically, the participants noted that it is important to identify the priority goals and processes that need to be addressed and that other goals (e.g., promoting maternal confidence and self-esteem) should be achieved indirectly. Thus, the participants suggested that the web-based intervention should include four to five sessions.

With respect to thematic organization, the participants reported that the first session should address issues related to changes and reorganizations during the transition to parenthood. Moreover, the initial sessions should address emotional reactions during this transition and should provide psychoeducation about the cognitive-behavioral model. Cognitive processes were the second main topic to be addressed in the intervention because this understanding may be important to the following main topic to be addressed: communication and interpersonal functioning. The final topic to be addressed involved educating women about depressive symptoms and the help-seeking process as well as addressing issues related to accepting the challenges and changes of adapting to motherhood.

Although information about infant development and caregiving was not included in the main thematic content, the participants also stressed that this may be included as extra information. Finally, the participants highlighted that the intervention content and

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goals should be grounded in the basic principles of CBT for depression prevention (e.g., the cognitive-emotional-behavioral link).

Interpersonal relationships. Within this topic, six themes emerged, two related to the couple's relationship (Couple's communication [15] and Couple's relationship changes [12]), and four related to the extended social network (Communication with others [17], Social isolation [4], Social support [4] and Unrealistic expectations [3]).

With respect to the topics targeting the couple's relationship, the participants highlighted the important role of educating women about normative changes in the couple's satisfaction and intimacy during the postpartum period, and how to use effective communication strategies to address those changes. Concerning topics related to the social network, the participants indicated the importance of training women's assertive communication skills to help them to clearly communicate their needs and feelings to others (families of origin; friends). Moreover, the participants emphasized the importance of addressing women's social isolation and working on skills to activate support from others (identify needs and sources of support, ask for help) as well as address unrealistic expectations of support from others.

Traditional stress and depression management. Two other themes emerged in relation to stress and depression management: Behavioral activation [39] and Stress and anxiety [6]. Specifically, with respect to behavioral activation, the participants stressed that this may not be an essential target in the early phase of preventive interventions for PPD, and its early inclusion may even strengthen mothers' feelings of incompetence and failure. Moreover, the participants reported that relaxation skills to address stress and anxiety were not an essential component of interventions to prevent PPD.

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Changes and reorganizations during the transition to parenthood. Participants reported five themes within this topic: Normativity of changes [19], Acceptance [11], Perfect motherhood and role idealization [6], Daily routines changes [4], and Role and identity changes [3].

Within these themes, the participants highlighted the importance of educating women about the different changes that occur (e.g., identity and reorganization of different roles, changes in daily routines such as housework), the normativity and desirability of those changes, and the role of unrealistic expectations about motherhood in women's adaptation to those changes. Furthermore, the participants emphasized the importance of implementing therapeutic strategies to promote women's acceptance of these changes and reorganizations, including coping strategies to address them.

Signs and symptoms of PPD and help seeking. Within this topic, four themes emerged: Signs and symptoms of PPD [27], Acceptance (plan for the future) [6], Normative vs. nonnormative changes [4], and Help-seeking plan [2]. Specifically, the participants reported that information should be given about the signs and symptoms of PPD, although they considered it less relevant to provide information about its risk factors. Moreover, the participants indicated the importance of helping women to distinguish between normative and nonnormative emotional reactions during the perinatal period and to increase women's awareness of the benefits of seeking professional help and developing a help-seeking plan in case of need. Finally, the participants stressed that the intervention should end with a plan for the future (normalization and acceptance of future challenges).

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Cognitions. Within this topic, three themes emerged: Negative thoughts [19], Cognitive functioning [9], and Cognitive flexibility [3]. Specifically, the participants reported the importance of educating women about the normativity of negative thoughts during the postpartum period as well as training their ability to identify these thoughts in the context of a specific situation and associated emotions. Moreover, information should be given about general cognitive functioning (e.g., dysfunctional beliefs, cognitive distortions and how these influence the interpretation of events) and to promote cognitive flexibility (e.g., acceptance of negative thoughts, cognitive defusion).

Emotions. The participants addressed two main themes within this topic: Diversity of Emotions [7] and Emotional expression [2]. Specifically, the participants stressed that women should be educated about the diversity of women's emotional reactions (positive and negative emotions) and that the acceptance of this emotional diversity should be promoted. Moreover, the participants highlighted the importance of favoring women's expression of their emotions and difficulties with others so that this emotional diversity may be more easily accepted by women who experience it.

Intervention Dissemination

The participants discussed the dissemination of the web-based intervention in terms of its Timing [10], Format [10] and Content presentation [5]. Specifically, the participants stated that the dissemination of the web-based intervention could be initiated by health professionals during pregnancy in national maternity wards and health units. Pregnant women could have access to the landing page of the web-based intervention, which could provide general information about the transition to parenthood, although access to the web-based intervention (through login credentials

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available together with childbirth documents) should be provided only after birth. According to the participants, prior knowledge of the web-based intervention would increase the likelihood of its use in case of need. Moreover, the web-based intervention should be presented to the target population not only as a preventive intervention for PPD but also as an intervention to promote women's emotional well-being and adaptation to parenthood in the first months post-birth.

Discussion

This research aimed to describe the formative assessment process leading to the development of a web-based intervention to prevent PPD—the *Be a Mom* program. The results of the literature review and of the focus group allowed us to identify the main intervention characteristics as well as the main objectives and content to be addressed in the preventive intervention for PPD.

Although the literature review found mixed results regarding the effectiveness of preventive interventions for PPD, consistent with prior literature reviews (e.g., Dennis & Creedy, 2004), the mental health professionals highlighted that PPD is a suitable condition for implementing preventive approaches. In fact, PPD has a well-defined incidence period and clearly identified risk factors, making this condition a feasible target for prevention (Battle & Zlotnick, 2005; Pope, 2000). Moreover, and in line with prior research (Dennis, 2004), the mental health professionals suggested that preventive interventions should target modifiable risk factors for PPD, although it is also important to focus on the promotion of skills to address common challenges during the transition to parenthood.

Be a Mom: Intervention Characteristics

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The results of the literature review and the focus group presented congruent findings concerning the most relevant intervention characteristics to prevent PPD, allowing us to define the intervention characteristics of the Be a Mom program. First, our web-based intervention is short term and grounded in CBT principles because both the literature (Claridge, 2014; Sockol, 2015; Werner et al., 2015) and the mental health professionals suggested the importance of short-term preventive interventions grounded in a solid therapeutic approach, such as CBT. Moreover, there is prior evidence that CBT techniques tend to be easily operationalized in a web-based structured format (Cuijpers et al., 2008). However, the mental health professionals also emphasized the importance of including recent third-wave CBT approaches, particularly those based on acceptance and commitment and compassion therapies. Thus, recent developments in these approaches targeting PPD (Cree, 2015; Klausen, 2005) were used to inform the development of Be a Mom. Moreover, as suggested by O'Mahen et al. (2012), the CBT approach was modified to address perinatal-specific concerns.

Second, the Be a Mom program will be delivered during the postpartum period because both the literature review and the mental health professionals identified this period as an important time for the implementation of preventive approaches for PPD. Postpartum women may find the intervention more relevant (Dennis & Creedy, 2004; Sockol, 2015) and identify themselves more with the information given. However, mental health professionals also indicated that it would be advantageous to disseminate the Be a Mom program during the prenatal period and to offer general information about pregnancy and motherhood to women, which may encourage them to access the web-based intervention during the postpartum period.

Third, although the existing literature suggests that interventions to prevent PPD are most effective when they target at-risk women (e.g., Clatworthy, 2012; Dennis &

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Creedy, 2004; Werner et al., 2015), the mental health professionals also highlighted that most women may benefit from skills promotion to address the major challenges in the transition to parenthood. In fact, the preliminary results of Sockol et al. (2013) suggest that preventive interventions may be more effective in cases where no significant levels of depressive symptoms are experienced. Therefore, the Be a Mom program's content was carefully designed to be applicable to all women in the postpartum period (e.g., referring to the cognitive and emotional experience of women in the postpartum period rather than to the experience of "at-risk women"). Although the primary aim of the Be a Mom program was to prevent PPD in high-risk women through the enhancement of psychological resources (e.g., psychological flexibility, self-compassion), the results of the focus group were taken into account by considering that the Be a Mom program may be also a valid resource in promoting maternal mental and well-being among nonrisk women. This hypothesis should be further tested.

In addition to the more general intervention characteristics, the importance of other intervention features (e.g., availability of communication channels with users, humanization and individual tailoring) was stressed by the mental health professionals. These may improve users' adherence to the web-based intervention, which is congruent with existing research examining adherence to web-based interventions (Kelders, 2012). Some of these features (e.g., customized tailoring, personalized feedback, interactivity) are, in fact, distinctive features of most web-based interventions (Fotheringham et al., 2000) and were included in the Be a Mom program through the presentation of the session content in attractive formats (text, animation, video) and through the incorporation of several content-related interactive exercises with personalized feedback based on the user's responses. Personalized feedback (as a function of user's responses to exercises), content personalization (e.g., the text will be adapted to the baby's gender

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or to the fact of being twins), and the option of not visualizing contents that may not be meaningful for them (e.g., content related to the promotion of couple's satisfaction and intimacy, in the case of single mothers) are some examples of strategies that will help the participants to feel that the Be a Mom program is customized and tailored to their needs.

Moreover, given the importance of engaging users with the web-based intervention (Kelders, 2012), the Be a Mom program includes some "human characteristics"; specifically, it includes different characters in the intervention (namely, three mothers who share their personal stories throughout the intervention sessions, and a psychologist who synthesizes key messages and proposes exercises) to establish a closer relationship and proximity with users. Moreover, asynchronous communication channels (e.g., email, reminders), rather than synchronous channels (e.g., chat/forum), would be made available to enable communication between users and health professionals.

Furthermore, the perceptions of mental health professionals about the formal characteristics of the web-based intervention also allowed us to define its global structure. In line with other web-based interventions (Kelders, 2012), the Be a Mom program has a modular setup that is updated weekly, although the mental health professionals emphasized that women should have the opportunity to self-regulate their access to the intervention. This suggestion is understandable in light of the high caregiving requirements that women usually face in the early postpartum period.

Based on the results of the focus group, each session addresses one or two specific thematic contents. Following the structured and goal-oriented nature of CBT (O'Donohue & Fisher, 2012), after the presentation of each session's goals, the thematic content is presented interchangeably with several interactive exercises. In addition to

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psychoeducational content, for each thematic content, practical strategies are presented to be implemented and rehearsed by the women during the following weeks. At the end, the session's content is evaluated by the users with regard to its relevance and utility. Finally, and consistently with the basic principles of CBT (Thase & Callan, 2006), a homework activity is presented in each session to guarantee continued therapeutic practice.

Be a Mom: Intervention Goals and Content

The literature review and the focus group results identified the main goals and content to be included in the Be a Mom program. Table 3 presents the specific goals and content of each session of the web-based intervention.

The mental health professionals emphasized the importance of addressing the women's changes and reorganization during the transition to parenthood. This emphasis was congruent with the results found in the literature review because this topic was addressed in the majority of preventive interventions for PPD (e.g., Chabrol et al., 2002; Hagan et al., 2004; Ngai et al., 2009). Moreover, the mental health professionals identified the importance of considering the diversity of women's emotional experience during the transition to parenthood. The literature review results not only highlighted the relevance of addressing this topic but also suggested that both themes (change and reorganizations and emotional experience) were addressed together in the majority of existing preventive interventions, given their interrelated nature (e.g., Brugha et al., 2000; Hagan et al., 2004; Matthey et al., 2004). As a result, both themes are included in the first session of the web-based intervention.

Furthermore, both the literature review and the focus group results congruently highlighted the importance of addressing dysfunctional thoughts and beliefs as part of

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the intervention content (e.g., Brugha et al., 2000; Chabrol et al., 2002; Milgrom et al., 2011; Munoz et al., 2007) by promoting cognitive flexibility (e.g., acceptance of negative thoughts, cognitive defusion; Klausen, 2005), as advocated in ACT (Hayes et al., 1999). Therefore, this topic is addressed in the second session of the Be a Mom program.

However, other skills commonly addressed in depression treatment protocols (e.g., behavioral activation, problem-solving skills) were not equally valued by the literature review or by the mental health professionals, particularly with regard to preventive efforts for PPD. Moreover, although the promotion of stress and anxiety management skills (e.g., Austin et al., 2008; Crockett et al., 2008; Elliott et al., 2000; Munoz et al., 2007) and maternal self-competence (e.g., Austin et al., 2008; Buist et al., 1999; Chabrol et al., 2002) were found in most of the existing preventive interventions for PPD, the mental health professionals did not consider it relevant to target these skills directly in the web-based intervention. Therefore, instead of using traditional behavioral activation and problem-solving strategies, we ground the intervention in ACT premises to increase women's contact with their direct experience (emotional and cognitive) and to create more flexible and value-directed behavioral repertoires (Hayes et al., 1999). According to ACT, a set of clearly defined values and associated goals (e.g., associated with parenthood) are essential prerequisites for guiding women's behavioral repertoire (Coyne & Murrell, 2009; Hayes et al., 1999).

Although the results of the focus group have identified interpersonal relationships as an important topic to be addressed in preventive interventions for PPD, the literature review indicated that most interventions target the promotion of social support (e.g., reducing social isolation and activating support; Austin et al., 2008; Brugha et al., 2000; Crockett et al., 2008; Lara et al., 2010; Munoz et al., 2007),

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whereas dyadic issues (e.g., couple's satisfaction and communication skills) are rarely addressed (Cho et al., 2008; Matthey et al., 2004; Milgrom et al., 2011; Zlotnick et al., 2006). Because there has been increasing recognition of the role of the couple's relationship functioning as a risk and maintenance factor for PPD (Pilkington, Milne, Cairns, Lewis, & Whelan, 2015), we opted to address these topics in two separate sessions: one session targeting social support and another session specifically targeting communication and negotiation skills within the couple, as well as the promotion of couple's well-being. In order to take into account the diversity of family structures (e.g., single parents, same-sex couples) the session addressing the couple's functioning and well-being will be worthy of special attention. The visualization of this session (totally or partially) will be optional for women reporting not being in a relationship (the topic addressing communication with other support sources will be also included in the prior session). Furthermore, inclusive terms (e.g., partner, cohabiting couples) within the session content will be used.

The last session of the Be a Mom program will target education about signs and symptoms of depression, as suggested by the literature review (e.g., Crockett et al., 2008; Hagan et al., 2004; Hayes et al., 2001; Ho et al., 2009; Kozinsky et al., 2012) and by the focus group. Although few existing interventions (Hayes et al., 2001; Kumar, 1998) address stigma reduction and the development of a help-seeking plan in case of pervasive depressive symptoms, the mental health professionals considered this a very important topic to be included in the intervention. Finally, the mental health professionals emphasized that the intervention should end with strategies and content associated with relapse prevention, including women's normalization and acceptance of future challenges and the way that learned skills may help women address them. Accordingly, this topic is included in the last session of the Be a Mom program.

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Strengths, Limitations, and Future Directions

Despite the preliminary nature of our findings, the formative evaluation process reported in the present study provides a better understanding of the behavior problem (PPD) and the specific needs that should be addressed to prevent this clinical condition among women during the postpartum period. This is crucial to inform the design, characteristics and content of the web-based intervention to prevent PPD. Building on existing preventive interventions for PPD, these formative research procedures lead to a thorough identification of intervention characteristics and goals that may improve the intervention and may promote its adequacy, implementation success, and effectiveness within the target population, through a more efficient use of resources (Worthen et al., 1997).

Despite the advantages of the implementation of formative assessment procedures, this research has some limitations that need to be acknowledged. Concerning Phase 1 (scoping literature review), the systematic search was limited to publications published in English, which may have introduced publication bias. However, the use of cross-referencing (i.e., inspecting published reviews targeting PPD preventive interventions) and the use of broad terms in the search procedures produced a thorough identification of relevant studies. Moreover, although we reported some effectiveness results of the preventive interventions for PPD, the primary focus of this study was the qualitative analysis and descriptions of the goals and content of the interventions. Finally, although the proposed categorization of the therapeutic goals—which was necessary to systematize the results—was informed by the existing literature and discussed with various researchers with experience in the field, we cannot exclude

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the possibility that the proposed categorization limited the identification of specific therapeutic goals of the existing preventive interventions for PPD.

Regarding Phase 2 (focus group), all participating mental health professionals were women from the central region of the country (given its increased accessibility to the place where the focus group was held) with a similar training background in CBT, which may have influenced the results obtained. Conducting additional focus groups to capture the perspectives of a high number and a more diverse sample of mental health professionals (e.g., from other regions of the country, with different backgrounds) could have provided a broader set of outcomes and reflections. The option of including only professionals with a background in CBT was justified by the fact that CBT has been found effective in preventing and treating PPD (Sockol, 2015) and is a well-suited therapeutic model to be operationalized to the web-based format (Cuijpers et al., 2008). Moreover, other issues may have influenced the nature of the results, such as the familiarity of the facilitator with some of the participants or between some of the participants, which may also have influenced group dynamics and the desirability of responses. Although our explanatory sequential design (begin the focus group with a brief presentation of the main results of Phase 1—scoping review) was justified to allow mental health professionals to build up from prior knowledge on the field, we cannot completely exclude that this information may have biased the participants' opinions. In addition, the triangulation of the focus group's results with other assessments or with the results of focus groups with other populations (e.g., women with postnatal depressive symptoms) was not conducted, which could have ensured the convergence of results.

Finally, the formative evaluation also sets the stage for subsequent, more controlled research stages, particularly with regard to the intervention effectiveness at

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the end of implementation. Following the recommendations of the Stage Model of Behavioral Therapies Research for the development of complex interventions (Rounsaville et al., 2001), and specifically for the development of web-based behavioral interventions (Danaher & Seeley, 2009), a pilot study and a randomized controlled trial (RCT) will be conducted to provide summative feedback about the effectiveness of the Be a Mom program in preventing PPD. In both studies, a sample of high-risk women (women presenting risk factors for PPD) will be randomly assigned to the experimental condition (web-based intervention to prevent PPD) or to the control group. The effectiveness of the program in preventing PPD will be tested in post-intervention and follow-up assessments during the first year postpartum, but intervention benefits for secondary outcomes (e.g., dyadic adjustment, individual well-being) will also be investigated. Moreover, because the mental health professionals highlighted that even women who are not at an immediate risk of developing PPD may benefit from the intervention, an additional arm of the RCT will be included to examine the effectiveness of the web-based intervention for PPD among nonrisk women.

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Table 1

Preventive Interventions for PPD: Intervention Characteristics (*n* = 29)

Author, year [Country]	Target group	Timing of delivery	Administration method	Intervention type (Therapeutic Orientation)	Number of sessions	Intervention facilitator	Trial Type, control type, sample size	Main results
Austin et al., 2008 [AUST]	Selective/ Indicated	Pre+Pos	Group	Psychotherapy (CBT)	6 + 1 booster (postnatal)	Both	RCT, Booklet, 277	A significant symptomatic improvement over time for both intervention and control groups was found – no significant differences in improvement between both groups.
Anton et al., 2015 [ROM]	Universal	Prenatal	Ind+Group	Psychotherapy (REBT-CBT)	1 (individual) + 8 (group)	Mental Health Specialist	RCT, SC, 48	No significant differences in depressive symptoms between women in the intervention and the control group were found; however, women in the intervention group presented significantly lower levels of negative emotionality and distress.
Bernard et al., 2011 [USA]	Selective/ Indicated	Postnatal	Individual	Psychotherapy (CBT)	3	Mental Health Specialist	RCT, SC, 56	There was a trend for women in the intervention group to report lower levels of depression than the control group (marginally significant differences), at 1 month follow-up.
Brugha et al., 2000 [UK]	Selective/ Indicative	Prenatal	Group	Psychotherapy (Other)	6 + initial + reunion	Non Mental Health Specialist	PRCT, SC, 209	No significant differences in depressive symptoms were found between groups at 3 months postpartum.
Buist et al, 1999 [AUST]	Selective/ Indicative	Prenatal	Group	Psychoeducati on	10	Both	RCT, SC, 44	No significant differences in depressive symptoms were found between groups at 6 weeks and 6 months postpartum.
Chabrol et al., 2002 [FRAN]	Selective/ Indicative	Postnatal	Individual	Psychotherapy (CBT)	1	Mental Health Specialist	RCT, SC, 258	Compared to the control group, women in the intervention group had significant reductions in the frequency of probable postpartum depression.

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Cho et al., 2008 [KOR]	Selective/ Indicative	Prenatal	Individual	Psychotherapy (CBT)	9	Mental Health Specialist	RCT, Informative session, 27	Women in the intervention group showed significantly less depressive symptoms than women in the control group, 1 month postpartum.
Crocket et al., 2008 [USA]	Selective/ Indicative	Prenatal	Ind+Group	Psychotherapy (IPT)	4 (group) + 1 (individual)	Mental Health Specialist	RCT, SC, 36	No significant differences in depressive symptoms were found between groups at 3 months postpartum; however, women in the intervention group reported significantly better postpartum adjustment 3 months postpartum (assessed with Social Adjustment Scale).
Elliot et al., 2000 [UK]	Selective/ Indicative	Pre+Pos	Group	Psychoeducation	11	Both	CT, SC, 99	First-time mothers (but not multiparous mothers) in the intervention condition were significantly less likely to present depressive symptoms at 3 months postpartum in comparison with the control group.
Gao et al., 2012 [CHIN]	Universal	Pre+Pos	Ind+Group	Psychotherapy (IPT)	2 (group) + 1 (individual)	Non Mental Health Specialist	RCT, SC, 194	At 3 months postpartum, the intervention group had significantly less depressive symptoms and better adjustment than the control group.
Grote et al., 2009 [USA]	Selective/ Indicative	Pre+Pos	Individual	Psychotherapy (IPT)	1 engagement + 8 (intervention) + 6 booster (postnatal)	Mental Health Specialist	RCT, Enhanced support, 53	Women in the intervention group displayed significant reductions in depression levels 6 months post-partum than women in the control group.
Hagan et al., 2004 [AUST]	Selective/ Indicative	Postnatal	Ind+Group	Psychotherapy (CBT)	1 (individual) + 6 (group)	Non Mental Health Specialist	RCT, SC, 199	No differences were found between groups in the incidence of depression 12 months postpartum, nor in the time of onset or duration of postpartum depressive episodes.
Hayes et al., 2001	Universal	Prenatal	Individual	Psychoeducation	1 (Education package)	Non Mental Health Specialist	RCT, SC, 188	No significant differences between intervention and control groups were found 8-12 and 16-24 weeks postpartum.

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[AUST]									
Ho et al., 2009 [TAIW]	Universal	Postnatal	Individual	Psychoeducation	1 (Education Package)	Non Mental Health Specialist	RCT, SC, 200	Women in the intervention group were less likely to have high depression scores when compared to the control group at 3 months postpartum.
Kozinsky et al., 2012 [HUNG]	Universal	Prenatal	Group	Psychotherapy (CBT/IPT)	4	Both	RCT, SC, 1719	Women in the intervention condition were significantly less likely to experience depressive symptoms at 6 weeks postpartum, when compared with the control group.
Kumar et al., 1998 [JAP]	Universal	Prenatal	Group	Psychoeducation	1 session	Mental Health Specialist	CT, SC, 40	The number of women with postnatal major depressive disorder in the control group was significantly higher than in the intervention group.
Lara et al., 2010 [USA]	Selective/ Indicative	Prenatal	Ind+Group	Psychotherapy (CBT)	8 (group) + 2 individual booster sessions	Non Mental Health Specialist	RCT, SC+Booklet, 377	There were significantly fewer new cases of depression in the intervention group than in the control group at 6 weeks and 4-6 months postpartum; however, both groups presented a similar reduction of depressive symptoms over time.
Le et al., 2011 [USA]	Selective/ Indicative	Prenatal	Ind+Group	Psychotherapy (CBT)	8 (group) + 3 individual booster sessions	Mental Health Specialist	RCT, SC, 217	The cumulative incidence of major depressive episodes during the first year postpartum was not significantly different between both groups; although a significantly higher reduction of depressive symptoms was found in the intervention group after the intervention, the effect of intervention was not significant over time.
Mao et al., 2012 [CHIN]	Universal	Prenatal	Group	Psychotherapy (CBT)	4 + 1 booster session	Non Mental Health Specialist	RCT, SC, 240	Women in the intervention group presented significant less depressive symptoms than in the control group at 6 weeks postpartum. Women in the intervention condition were significantly less likely to experience postnatal depression at 6 weeks postpartum.
Mathey et al., 2004 [AUST]	Universal	Prenatal	Group	Psychoeducation	1 session + 2 booster sessions	Both	RCT, SC+Baby Play, 268	At 6 weeks post-partum, women with low self-esteem, who had received the intervention, presented significantly less depressive symptoms than women in either of the two control conditions. No significant effects were found at 6 months postpartum.
Milgrom et	Selective/	Pre+Pos	Individual	Psychotherapy	9 sessions	Mental	RCT,	Women in the intervention group reported lower levels of depression

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al., 2011 [AUST]	Indicative			(CBT)	(self-help workbook + telephone sessions)	Health Specialist	SC+networking, 143	at 12 weeks postpartum than women in the control group. Women in the control group scored significantly more above threshold than women in the intervention group.
Munoz et al., 2007 [USA]	Selective/ Indicative	Pre+Pos	Group	Psychotherapy (CBT)	12 sessions + 4 booster sessions postpartum	Mental Health Specialist	RCT, SC, 41	No significant differences were found in depressive symptoms levels of both groups of women, over time (from 1 to 12 months postpartum); women in the intervention group were not less likely to develop a postpartum depressive episode.
Ngai et al., 2009 [HONG]	Universal	Prenatal	Group	Pshychoeducation	3 sessions (in additional to 3 standard childbirth educational classes	Non Mental Health Specialist	CT, SC, 184	Women in the intervention group presented an overall reduction in depressive symptoms from baseline to 6 months postpartum, compared to women in the control group.
Perez-Blasco et al., 2013 [SPAI]	Universal	Postnatal	Group	Psychotherapy (CBT-Mindfulness)	8 sessions	Mental Health Specialist	RCT, SC, 26	Women in the intervention group exhibited significantly less psychological distress, anxiety and stress post-intervention than women in the control group.
Silverstein et al., 2011 [USA]	Selective/ Indicated	Postnatal	Individual	Psychotherapy (CBT)	4 sessions	Non Mental Health Specialist	RCT, SC, 50	No significant differences were found between groups, although women in the intervention group tended to be less likely to experience an episode of moderately severe depressive symptoms over the 6-month follow-up period.
Stamp et al., 1995 [AUST]	Selective/ Indicated	Pre+Pos	Group	Psychoeducation	2 (prenatal) + 1 (postnatal)	Non Mental Health Specialist	RCT, SC, 144	No significant differences in depressive symptoms were found between women in the intervention and in the control group at 6 weeks, 12 weeks and 6 months post-partum.
Tandon et al., 2014 [USA]	Selective/ Indicated	Pre+Pos	Ind+Group	Psychotherapy (CBT)	6 + 2 booster sessions	Both	RCT, SC+information, 78	Depressive symptoms declined at a significant greater rate for women in the intervention group at 1 week, 3 and 6 months post-intervention; At 6 months post-intervention, women in the intervention group were less likely to have a depressive episode than women in the control group (marginally significant trend).

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Wicklund et al., 2010 [SWED]	Selective/ Indicated	Postpartum	Individual	Psychotherapy (CBT)	3 sessions	Mental Health Specialist	RCT, Informative session, 67	Women in the intervention group showed a more rapid decline in depressive symptoms and were less likely to present clinically significant depressive symptoms than the control group at 2 months postpartum.
Zlotnick et al., 2001, 2006 [USA]	Selective /Indicated	Prenatal	Ind+Group	Psychotherapy (IPT)	4 (group) + 1 booster session (individual)	Non Mental Health Specialist	RCT, SC, 86	Women in the intervention condition were less likely to develop a major depressive disorder at 3 months postpartum than the control group.

Note. AUS = Australia, CHIN = China, FRAN = France, HUN = Hungary, HONG = Hong-Kong, JAP = Japan, KOR = Korea, ROM = Romania, SPAI = Spain, SWED = Sweden, TAIW = Taiwan, UK = United Kingdom, USA = United States of America, CBT = Cognitive-Behaviour Therapy, IPT = Interpersonal Psychotherapy, REBT-CBT = Rational Emotive Behavioral Therapy-Cognitive, RCT = randomized controlled trial, PRCT = Pragmatic Randomized Controlled Trial, CT = Controlled trial, SC = Standard Care.

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Table 2

Web-Based Preventive Intervention for PPD: Representative Excerpts of the Different Themes Identified by the Mental Health Professionals

Themes		Example
PPD Prevention [39]		
	Risk & Protection [26]	"*Preventive interventions should focus in the risk factors, but may also focus on the activation of protective factors.*" "*…to promote skills that balance with risk factors*"; "*We know that preventing postpartum depression (...) we know that it is also to promote adaptation to the transition to parenthood.*"
	Relevance/Appropriateness [7]	"*…when we know that the likelihood is high… it makes sense to prevent it!*" "*I do not want to pathologize, but I think these preventive interventions can be a useful tool for most women, who live parenthood very lonely…*"
	Risk assessment [6]	"*This issue of risk assessment…I find it essential!*"
Intervention characteristics [409]		
General intervention characteristics [34]	Intervention timing [22]	"*In the postpartum period the effectiveness of the interventions is higher, especially because women identify themselves more with the content of the intervention (...) is the women's direction of their attention toward these topics…*" "*The intervention can begin in pregnancy because pregnant women can access to a set of information, perhaps with greater calmness. So, with different contents, of course, but it may be useful to give some information during pregnancy…*"
	Target Population [9]	"*This intervention aims to reach a large number of women…*"; "*although we know that there are women at higher risk for postpartum depression, the transition to parenthood is often a difficult time…*"; "*perhaps beyond specific topics targeting women at-risk for postpartum depression, there must be things that can even help women who do not have postpartum depression.*"
	Strong Theoretical Background [3]	"*Keeping our cognitive behavioral framework in mind… I think it is very important, very functional and makes sense in some topics (...), to include some aspects of the third-wave generation, namely related to acceptance and to acceptance and compassion-focused therapies*".
User's adherence [66]	**Interaction with users [25]**	
	Reminders [10]	"*…users can receive messages with tips, as often as they liked… for example, they may be in a difficult time with their baby and see that email or message remembering some tip that we talked about in the prior session…*"
	Forums/Chat [8]	"*We know that* [when no moderation exists] *the distortion and resonance of information could be dangerous…*" "*…to happen, it would need to be moderated by a health professional…*"
	Emails [7]	"*The possibility of asynchronous contact with a health professional I think it's important to… to mediate… they have to think, organize ideas to write an email….*"
	Tailoring [22]	
	Customized content	"*It may make sense that the web-based intervention meets the different needs of*

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	[9]	*different users…*"
		"*… it should be responsive to each user's preferences and needs…"*
	Personalized feedback [8]	"*…being able to give this feedback, depending on the user's responses to scales and exercises…*"
	Interactivity [5]	"*…including interactive exercises that introduce novelty…*"
		"*…something different from what they have in magazines and informative websites…*"
	Humanization [19]	
	Human Faces [8]	"*…human faces are missing…*"; "*… to have professionals speaking can also be helpful.*"
		"*It gives credibility. And security.*"
	Relationship [7]	"*It lacks… who does psychotherapy knows so well that… what grabs the person or not… it's the relationship*".
	Personal Stories [4]	"*…I think that personal stories were important, we can illustrate specific contents with real examples*".
Formal characteristics [32]	Session assessment [14]	*"…assessing their knowledge I don't think so… but having some questions about user's satisfaction, utility, etc., and then give them feedback, I think it's ok…*";
	Session schedule [12]	"*Perhaps the best is the users to self-regulate.*"
	Session structure [4]	"*…it would have to have a key thematic content… it makes no sense to talk about many topics at the same time*".
	Continuity between sessions [2]	*"…to give some homework…"*
		"…to make some connection to the prior session, namely asking by the practice…"
Goals & Content [277]	**Content organization [55]**	
	Thematic content [23]	"*We may use specific examples, such as "The baby is so skinny. Your milk should not be good"… This is a classic example and this is more related to the cognitive processes – dysfunctional interpretations and attributions, and not exactly on a specific session about breastfeeding".*
	Thematic organization [18]	"*The goals that should be included at an early stage, should be the ones related to psychoeducation about the changes and reorganizations during the transition to parenthood…"*
		"*…to understand the role of thoughts and beliefs, and its influence in our emotions and behaviors… it can help women to see things from the other's perspectives… that is, to identify filters…*"
		"*…then to talk about communication, including interpersonal issues, the family, the couple, social support…*"
		"*… at a final stage, to identify depressive symptoms that can induce help-seeking"*
	Cognitive-Behavioral Therapy Principles [7]	*"Yes, the links of the cognitive-behavioral model should be included in the first session*".
	Extra Information [7]	"*Having a set of information about caregiving and infant development, that I think should not be included as session's content, but as extra information… available…"*

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Interpersonal Relationships [55]	
Communication with Others [17]	"[To help] *the person to be able to communicate to others what she feels and thinks*." "*I think this is an important issue, the communication with the family of origin…*"
Couple communication [15]	"*... The issue of communication ... to open the channels of communication between the couple ...*" *"Working on communication processes* [within the couple] *seems important to me..."*
Couple Relationship Changes [12]	"*I think that is* [important to show]*… that marital satisfaction has different patterns after the birth ...*" "*The feeling of intimacy ... so a sense of broader intimacy...*"
Social Isolation [4]	"*Is to make the women can go for a walk with her baby in the afternoon, and find a friend to take a quick coffee... I mean… is to reduce this isolation, to help women…*"
Social Support [4]	*"to promote help-seeking strategies (...), to show how this moment is a moment that requires women to relate to the outside world differently from how they related before ..."*
Unrealistic Expectations [3]	"*Some situations that I find a little bit related with some inadequate expectations in terms of what should be the social support they receive…*"
Traditional Stress and Depression Management [45]	
Behavioral activation [39]	*"They no longer have time for anything and we are still staying… you should go to the gym, you should…"* *"I think it's important to make adjusted expectations, because our greatest danger is to strengthen the women's sense of incompetence..."*
Stress and Anxiety [6]	*"Although we say that this is a stress inducing period, it's not anxiety that most women experience... is the devaluation, isolation, communication difficulties..."* *"…it's a kind of anxiety that does not require relaxation skills…"*
Changes & Reorganizations [43]	
Normativity [19]	"*To give this approach that the changes were normal and desirable… that it is good to change for a different thing…*"
Acceptance [11]	"*Promoting the acceptance of these aspects, whether personal or situational*"; "*To help women to balance… to learn to enjoy what they have*."
Perfect motherhood & Role idealization [6]	"*I think it's preventive to say: No, it's ok if you can't do everything…*" *"And then there's the whole question of idealization… that we must like everything... we must like to change the diaper, to wake up during the night… no! These are less good details of the process…*"
Daily Routine [4]	"*The women lived in a clean and organized house, where everything was predictable, and goes through a moment of chaos, unpredictability ...*"
Role & Identity [3]	"*To talk about the change and especially when there are marked and challenging roles, namely professional ones… which suddenly changed completely…*"
PPD symptoms and	

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	help-seeking [39]	
	Signs and symptoms of PPD [27]	"*To talk about the warning signs and symptoms of PPD…"*
	Acceptance (Plan for the future) [6]	"*To end with a normalizing message… a normal path…"* *"That focus more on the issues of acceptance, and management of expectations concerning the future…"*
	Normative vs. non-normative changes [4]	*"Sometimes the distance between "this is very difficult" and "I'm depressed" is a short distance..."*
	Help-seeking plan [2]	"*To talk about what to do if you feel this* [depressive symptoms] *is present, to ask for professional help and maybe to talk a bit about the benefits..."*
	Cognitions [31]	
	Negative Thoughts [19]	*"I think helping the woman to detect their dysfunctional thoughts, which will be so many ..."* *"Is important (...) to give some information about… about being normal that, at times, some negative thoughts arise, which are frequent... "*
	Cognitive Functioning [9]	"*To talk about dysfunctional thoughts and beliefs ... (...) and some basic information about cognitive distortions…"* *"Yes, for example: "I am a bad mother, I will never be able to breastfeed"... ok, be able to understand that this is an interpretation…"*
	Cognitive Flexibility [3]	*"To promote psychological flexibility, namely acceptance, understanding and accepting thoughts...."* *"... and to prevent cognitive fusion ... strategies for this ..."*
	Emotions [9]	
	Diversity of Emotions [7]	"*To include the diversity of emotional reactions ..."* "*They did not expect to feel this* [negative emotions], *and so it is important to address this topic"*
	Emotional expression [2]	"*…also to encourage women's sharing of their emotional state with others…*"
Intervention Dissemination [25]		
	Timing [10]	"*The pregnant women may register and have access to simple contents.*" "*… even though you not need, you know that it's there.*"
	Format [10]	*"To have some more general information* [about motherhood] *that can attract women… to call their attention to this…"*
	Content presentation [5]	"[We should present the intervention] *as having a dual focus, that is, the goal of the intervention is to promote skills and, when there is high risk, to prevent…"*

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Table 3

Be a Mom: Specific Goals and Content

Session	Goals	Content
1	1) Educate about the changes and reorganizations (at the individual, familiar and social levels) during the transition to parenthood; 2) Normalize the usual discrepancy between the women's expectations and the postpartum reality (in terms of changes/reorganizations), and promote the acceptance and coping with the characteristics of this life period; 3) Normalize and identify the diversity of women's emotional experience, and promote its non-evaluative acceptance of the different emotions; 4) Educate about the cognitive-emotional-behavioral link (understanding the relationship between thoughts, emotions and behaviors).	• Changes and reorganizations during transition to parenthood • Unrealistic expectations, Role idealization and Perfect motherhood • Emotional experience • Cognitive-emotional-behavioral link
2	1) Normalize and identify the occurrence of negative automatic thoughts in the postpartum period; 2) Educate about the individual's cognitive functioning (e.g., how cognitive fusion and thoughts suppression strategies contribute to the maintenance and exacerbation of negative thoughts); 3) Promote cognitive flexibility (e.g., acceptance and non-evaluative approach to previously avoided private experiences, cognitive defusion) and self-compassion as ways to deal with the women's private cognitive experience.	• Negative thoughts • Reducing the power of thoughts: questioning and defusion • Self-criticism and self-compassion
3	1) Identify, create and clarify parenthood values, and making committed actions in accordance to those values; 2) Reduce women's social isolation; 3) Identify support needs, sources of support and activate practical and emotional support from others; 4) Promote assertive communication skills.	• Values and commitment • Social network: How to identify support needs and ask for help; • Assertive communication: Dealing with family and friends;
4	1) Educate about the changes in couple relationship (e.g., intimacy and satisfaction, sexual relationship) during the transition to parenthood; 2) Promote effective communication, negotiation and conflict management skills within the couple; 3) Promote affection and intimacy within the couple; 4) Normalize and accept differences in parenthood values within the couple and negotiate and commit with shared values.	• Changes in the couple relationship during the postpartum period; • Assertive communication within the couple: negotiation and conflict resolution skills; • Sharing parenthood values and commitments
5	1) Educate about signs and symptoms of PPD, treatment options and its benefits; 2) Develop a plan for professional help-seeking, in case of need; 3) Prevent future difficulties and challenges, by identifying them and reflecting on how the learned skills may be used in future situations.	• Identify PPD signs and symptoms • Professional help-seeking: treatment options and how to seek help; • A continuing journey: planning for the future;

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Figure 1. Therapeutic goals included in preventive interventions for PPD (% of interventions including the goal; n = 29).

Figure 2. Web-based intervention for PPD: Different themes identified by the mental health professionals (focus group).

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Highlights

- The CBT web-based intervention is short-term, and delivered postpartum
- The intervention has 5 modules updated weekly, each addressing a thematic content
- Acceptance and compassion-focused principles should be considered
- Interactive and human features are included in the intervention
- Formative evaluation may improve the intervention implementation and effectiveness

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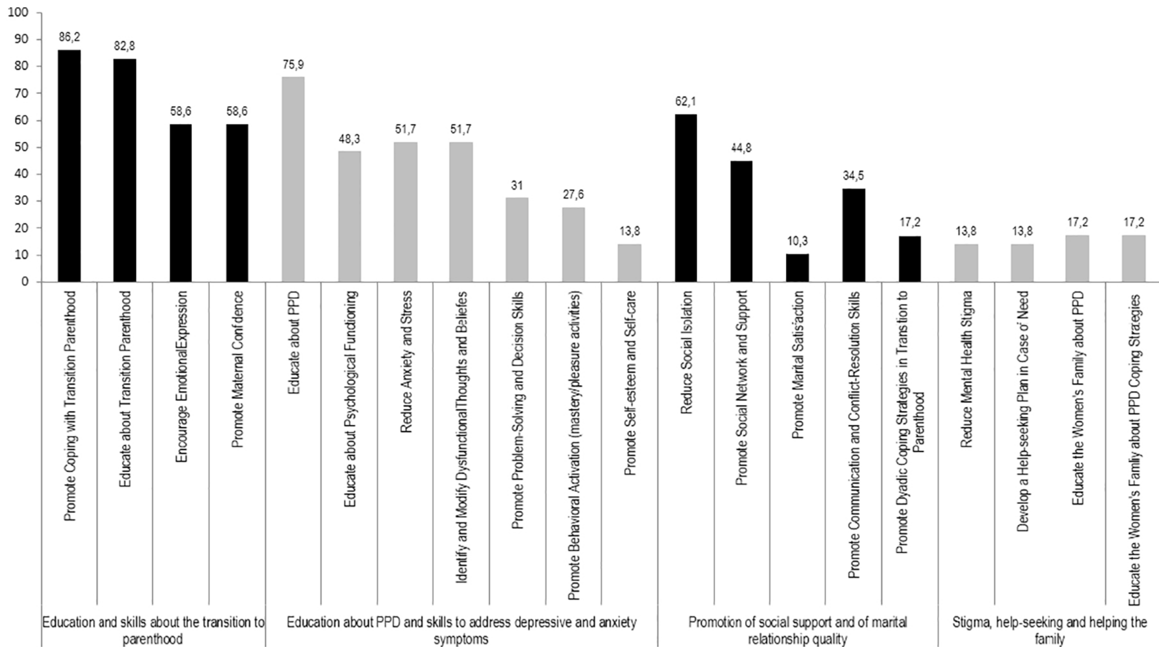

Figure 1

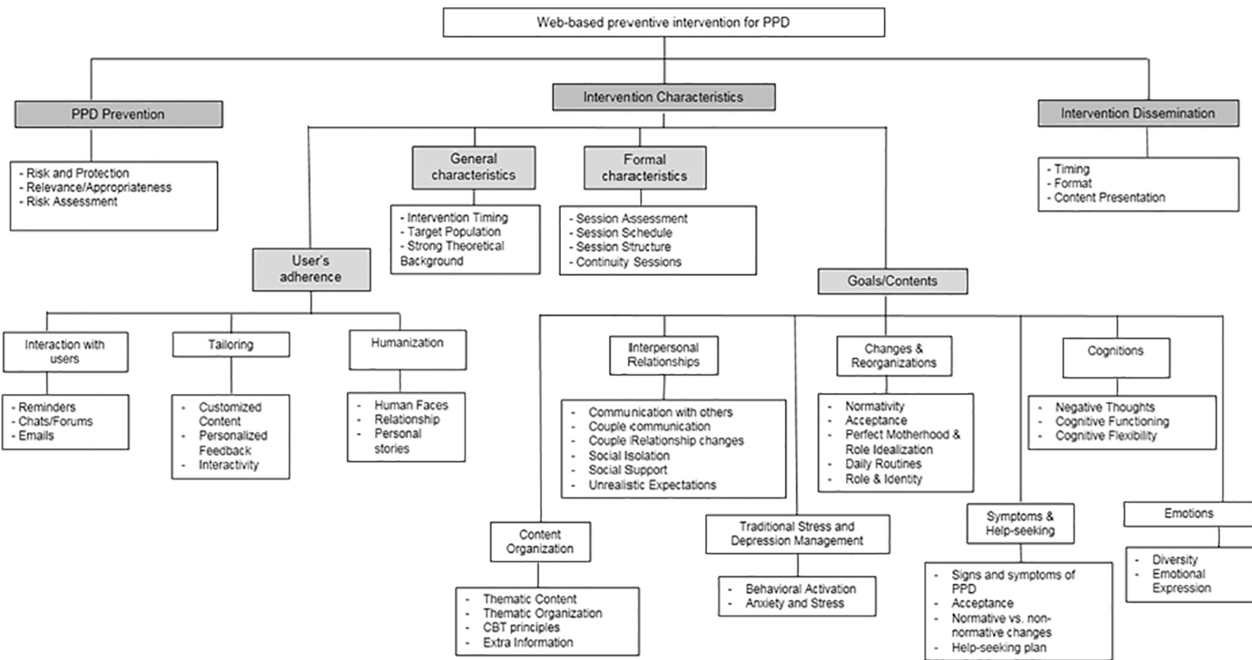

Figure 2