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RESEARCH ARTICLE

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Mother Matters: Pilot randomized wait-list controlled trial of an online therapist-facilitated discussion board and support group for postpartum depression symptoms

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Abstract

Methods: In a pilot randomized waitlist-controlled trial (Ontario, Canada), individuals aged ≥18 years with Edinburgh Postnatal Depression Scale (EPDS) scores greater than 9 and who self-identified as a mother to a child aged 0–12 months were randomized 1:1 to Mother Matters (intervention) or usual care (control), with an opportunity to receive the intervention after the study was complete. The primary outcome was protocol feasibility, evaluated through recruitment feasibility, intervention acceptability, and adherence to study follow-up measures. Secondarily, postintervention EPDS scores and remission rates (EPDS < 10) were compared between groups.

Results: Ninety-eight participants were randomized ($n = 50$ intervention; $n = 48$ control) and seventy-seven (78.6%) completed postintervention questionnaires. About 88% of the intervention group ($n = 44$) logged into Mother Matters. Almost all topics were rated highly for relevance, there was good group cohesion and good satisfaction with the intervention. Mean (*SD*) EPDS scores decreased from 14.5 (4.07) to 11.3 (4.54) in the intervention group and 15.0 (3.56) to 12.0 (4.79) among controls (adjusted mean difference [aMD] −0.58, 95% confidence interval [CI]: −2.68 to 1.52), with remission in 37.8% versus 25.0% for intervention group and controls, respectively ($\chi^2 = 1.48$; $p = .224$). Among those with EPDS ≥ 16, the aMD was −3.66 (95% CI: −6.65 to −0.67) with remission in 41.2% in the intervention group versus 10.0% among controls ($\chi^2 = 4.50$; $p = .06$).

Conclusion: This study supports the pursuit of online, therapist-facilitated, discussion board support group strategies for PPD. A large-scale efficacy and cost-effectiveness evaluation of Mother Matters is warranted.

KEYWORDS
e-health, group, postpartum depression

1 | INTRODUCTION

Postpartum depression affects as many as 13% of women in the first year postpartum (Meltzer-Brody et al., 2018). Symptoms can include low mood, sadness, irritability, poor concentration, a feeling of being overwhelmed, and guilt. Untreated and undertreated postpartum depression can have serious negative long-term consequences for maternal well-being, including chronic depression and suicide (Grigoriadis et al., 2017). It is also linked to problems with maternal–infant attachment, child development and family well-being, making timely and effective treatment paramount (Stein et al., 2014).

Postpartum support groups are associated with a reduced likelihood of significant postpartum depression symptoms at 1-year postpartum, compared to usual postpartum care (Dennis & Hodnett, 2007). It is thought that the group format allows women to receive support, share their experiences, and learn effective coping strategies from their peers, in addition to benefitting from therapist intervention. Yet, many women do not access services (Byatt et al., 2016). Barriers include shame and stigma, unpredictable child schedules, a need to return to work, and transportation challenges making attending regular treatment sessions difficult (Dennis & Chung-Lee, 2006; Sedgley et al., 2012). Access to timely care is also impacted by long waitlists for service, especially outside of large urban centers.

The use of electronic platforms for health care delivery ("e-health") is an attractive strategy for improving access when there are barriers to in-person participation for patients, or when specialized services are unevenly distributed across regions. Postpartum women report that the idea of being able to access care electronically is highly acceptable to them and that asynchronous options where they could access care at any time of the day or night—that is, on their own schedules—might help accommodate the unpredictable nature of the postpartum period (Rai et al., 2016). Although there is promising evidence regarding asynchronous electronic health (e-health) interventions for postpartum depression directed at individuals, group approaches have not been studied (Hussain-Shamsy et al., 2020; Vigod & Dennis, 2020). With the coronavirus disease 2019 (COVID-19) pandemic in March 2020, where restrictions on in-person group activities resulted in an explosion of e-health offerings, the generation of evidence around these types of interventions is even more essential.

Mother Matters is an online therapist-facilitated discussion board and support group for postpartum depressive symptoms, available across Ontario, Canada's largest province (population ~14.6 million, ~140,000 obstetrical deliveries annually). The intervention was developed by an expert clinical team at Women's College Hospital in Toronto, where educational materials and a discussion board are hosted on a secure, private, web-based forum accessible 24 h a day, 7 days a week. Moderated by highly trained psychotherapists during business hours, the intervention involves weekly educational topics, asynchronous therapist-facilitated discussion and teaching of symptom management strategies, and a weekly optional "live chat" hour where the therapists attend, and participants may join at their convenience.

The purpose of this study was to assess the feasibility of a randomized clinical trial protocol for evaluating the Mother Matters intervention to guide the planning of a future definitive trial. The primary objective was specifically to evaluate the feasibility of recruitment into a waitlist-controlled randomized trial, acceptability of the intervention to participants, and participant adherence to study follow-up measures. The secondary objective was to generate preliminary efficacy estimates in relation to postpartum depressive symptomatology.

2 | METHODS

2.1 | Trial design

A pilot randomized waitlist-controlled trial enrolled participants from across Ontario, Canada between May and October 2016. Participants were randomized 1:1 to Mother Matters (intervention condition), or to usual care (control condition). Participants completed baseline questionnaires proximal to the intervention condition group's start date, and the primary endpoint was immediately post-intervention. Baseline and follow-up data were collected using online questionnaires. Participants in the control group were offered the intervention after the primary endpoint, with the final participant completing trial procedures by January 2017. The study received ethics approval from Women's College Hospital, a fully affiliated University of Toronto Academic Health Science Centre in Toronto, Ontario, Canada (REB#:2016-032-B), and the protocol was registered at clinicaltrials. gov (NCT02953626).

2.2 | Participants

Individuals were considered for inclusion if they identified as a mother (inclusive of all genders, adoptive and birth parents), were 18 years or older with an infant between 0 and 12 months old living with them, resided in Ontario, and had an Edinburgh Postnatal Depression Scale (EPDS) score of 10 or above. *The Diagnostic and Statistical Manual of Mental Disorders*, version 5, indicates that a postpartum specifier is only to be added to a major depressive episode when the onset of the illness is either in pregnancy or within the first 4 weeks postpartum (American Psychiatric Association, 2013). In the current study, individuals with infants up to 12 months of age were included, as this is a commonly accepted time frame for the evaluation and treatment of depressive symptomatology with interventions specifically tailored to the postpartum time period—whether or not the onset of symptoms occurs within the first 4 weeks postpartum (Meltzer-Brody et al., 2018). The EPDS is not diagnostic of postpartum depression, but a score of 10 or above represents significant symptomatology and is a sensitive cut-off score for identification of possible postpartum depression (Cox

et al., 1993). For this intervention, sensitivity was prioritized over specificity so as to allow the broadest group of women who felt they required care to participate. Individuals with active suicidal ideation, mania, psychosis, or a substance or alcohol use disorder; and those without internet access, or unable to read or write in English were excluded from participation in the trial and were offered alternative health care options as appropriate from the clinical team.

There were no restrictions on the utilization of other treatments (i.e., psychotherapy, medication) in either study group, who were both eligible to receive usual care. Usual care services for postpartum depression symptoms in Ontario range from peer support and in-person support groups often moderated by a public health nurse, to individual or group psychological treatment, to psychotropic medication prescribed in primary care or by a psychiatrist. Availability of these resources varies by region of residence. In particular, access to psychotherapy services often depends on a person's ability to afford treatment because only psychotherapy delivered in a hospital setting or by a physician is publicly covered.

2.3 | Intervention

Mother Matters was developed by an expert clinical team at Women's College Hospital in Toronto, based on the framework of interpersonal therapy (IPT), an evidence-based first-line psychological treatment for postpartum depression (MacQueen et al., 2016). IPT is based on the premise that interpersonal distress is connected to the symptoms of depression. Thus, the threefold targets of treatment are biopsychosocial: psychiatric symptoms, social support, and interpersonal problem areas (i.e., the conflicts, transitions, and loss experiences in the patient's relationships); adaptations of IPT for postpartum depression focus on these targets as they related to the transition to parenthood (Stuart, 2012). The Mother Matters intervention was divided into 10 weekly topics that followed these principles, covering: (1) psychoeducation around the common types of postpartum mental illness, etiology, and treatment options (Weeks 1 and 2), (2) issues related to obtaining adequate social support (Week 3), and (3) interpersonal problem areas (Weeks 4–9), including challenges related to baby's sleep and feeding, maternal identity, and interpersonal relationships with partners. The final week (Week 10) was for consolidation and saying goodbye to the group (see Table S1 for weekly module summaries).

Two highly trained mental health therapists (with masters of social work degrees) facilitated the intervention. At the beginning of each week, one of the therapists posted educational information about the weekly topic to the forum, with a set of questions put to the group to prompt discussion related to the weekly topic. Participants could log into the forum any time of day, and post or respond to posts on the discussion board. During business hours, the therapists asynchronously moderated the discussion of the weekly topics, and coached participants on depression and anxiety symptom management strategies based on principles of mindfulness and dialectical behavior therapy. There was also a weekly optional "live chat" hour where the therapists attended, and participants could join ito have further discussion about the weekly topic and strategies associated with it. Altogether, the therapists spent ~4–6 h/week on the site, and could be contacted outside of the forum for nonurgent clinical or administrative concerns.

2.4 | Outcomes

2.4.1 | Trial protocol feasibility

The primary outcome was trial protocol feasibility. Specifically, this involved evaluating: (1) the feasibility of recruitment into the trial, (2) acceptability of the intervention to participants, and (3) adherence to study follow-up measures. Adverse events reported to therapists or to the study team were also recorded. Recruitment feasibility was assessed by measuring the time in weeks to complete a "recruitment wave." Acceptability was measured through (1) platform usage; (2) relevance ratings for each of the 10 weeks of the group (5-point Likert scale, from 1 = not at all relevant to 5 = highly relevant); (3) a nine-item scale evaluating group cohesion, adapted from the Therapeutic Factor Inventory Questionnaire (7-point Likert scale: 1 = not at all to 7 = extremely) (Burlingame et al., 2018); (4) a 25-item scale evaluating participant satisfaction with group content and process adapted from a previous virtual care trial (5-point Likert scale: 1 = strongly disagree to 5 = strongly agree) (Yang et al., 2019); and (5) free-text responses where participants could indicate what they found most and least relevant, and where they could suggest program modifications. Individuals in the intervention group completed the relevance ratings, group cohesion, and satisfaction questionnaires immediately posttreatment. Wait-list control participants were also offered to complete the questionnaires, but there was concern among the study investigators that those who completed the group and the questionnaires might be a particularly select group given the length of time between randomization and participation. Therefore, these data were not analyzed for waitlist control group participants. Adherence to study follow-up measures was calculated based on the proportion who completed follow-up questionnaires in both intervention and control groups at the primary endpoint, which was immediately posttreatment for the intervention group.

2.4.2 | Clinical outcomes

The secondary objective was to generate preliminary efficacy estimates that would guide the planning of a future definitive randomized clinical trial. The main clinical outcome of a future trial would be expected to be depressive symptoms. Therefore, the secondary outcomes reported here are: (1) depressive symptoms and (2) remission of depression, measured immediately posttreatment. These outcomes were measured using the EPDS, as in addition to being used as a screening tool, this scale is a patient-reported measure frequently used as an outcome of symptomatology in postpartum depression treatment trials

(Dennis & Hodnett, 2007). The remission of depressive symptoms in the current study was defined as EPDS score less than 10, as in previous similar studies (Dennis & Hodnett, 2007).

2.4.3 | Sample size

A sample size of 20–40 participants per condition is recommended for sufficient variability to assess implementation procedures, which is the objective of a pilot study (Hertzog, 2008). Since each Mother Matters group comprised 20–25 participants, we planned to recruit two intervention and two control groups for a sample size of 40–50 participants per condition. As the primary outcome was feasibility, we did not plan to be sufficiently powered to detect a statistically significant effect on depressive symptoms.

2.4.4 | Recruitment and enrollment

Participants were recruited through institutional social media channels and by advertising the study to networks of healthcare professionals across Ontario. Recruitment material such as study flyers directed women to the Mother Matters website, hosted by Women's College Hospital, where women self-referred to the study via telephone, email, or by completing a secure online form that contained preliminary information to determine eligibility. A study research assistant (RA) confirmed eligibility and complete informed consent procedures by telephone. Participants were enrolled in two recruitment waves. Group start dates for each recruitment wave were set once at least 20 participants were randomized to each study condition (based on the early stage of development of Mother Matters, suggesting 20–25 participants as optimal for interactive discussion). Wave 1 enrollment was from May 19 to July 4, 2016. Wave 2 enrollment was from September 15 to October 25, 2016.

2.4.5 | Randomization and blinding

Randomization was in a 1:1 ratio into either the intervention or control condition, stratified by recruitment wave. A research staff member external to the study generated the allocation sequence using www.randomizer.org to conduct a random-permuted block randomization and prepared a list of randomization ID numbers associated with allocation status that was concealed from study staff members. The study RA sequentially assigned randomization numbers to each participant after enrollment, obtained the allocation status associated with that randomization ID number via the external research staff member and informed participants of their allocation. Each participant then received a telephone call from one of the Mother Matters therapists to orient them to the intervention, and to provide a participant guide that contained instructions for navigating the online forum, expectations about group norms, and a unique secure login to the Mother Matters platform. Neither participants, research staff, nor the Mother Matters therapists could be blinded to group allocation, but all outcome data were collected online by self-report, reducing the potential for bias from nonblinded research staff and therapists.

2.5 | Data analysis

2.5.1 | Trial protocol feasibility

To evaluate recruitment feasibility, we calculated the number of participants screened, eligible, consented, randomized and who completed follow-up, and described baseline characteristics in each study condition. To evaluate the acceptability of the intervention, among participants allocated to the intervention group we: (1) tabulated platform usage by calculating the percentage who logged into the platform and who posted; (2) calculated means (standard deviations) for the weekly relevance ratings; (3) reported the proportion of individuals endorsing each of the Likert scale categories for the items on the group cohesion and satisfaction scales (including the median and interquartile range (IQR) for the scores on the group cohesion scale); and (4) summarized free-text participant responses.

2.5.2 | Clinical outcomes

To analyze the clinical outcomes, posttreatment EPDS scores were compared between participants in the intervention and control conditions using analysis of covariance to adjust for baseline score, generating mean differences (and 95% confidence intervals [CIs]). An intention-to-treat principle was followed. The proportion of women in each condition with EPDS less than 10 (remission) at follow-up was compared using Chi-square tests of association. As it was possible that severity of illness might moderate treatment outcome, in an additional analysis, we stratified by baseline symptom severity (EPDS 10–15 = mild to moderate; EPDS ≥ 16 = moderate to severe). Missing outcome data were not imputed.

3 | RESULTS

3.1 | Trial protocol feasibility

Of 140 women assessed for eligibility, 98 were randomized with 96 (98.0%) completing baseline data allowing for allocation (n = 49/50 intervention condition; n = 47/48 control condition). About 80.2% of these participants (77/96) provided posttreatment EPDS scores (Figure 1). Participants were enrolled from 10 of Ontario's 12 provincial health regions. Most were in their early 30s and married or living with a partner (Table 1). About 18.8% were born outside Canada and 20.8% had not completed postsecondary education. About 12.5% reported a family income of less than 40,000 Canadian dollars per year. Over half had been diagnosed with depression or anxiety by a health care provider in their lifetime. EPDS scores were

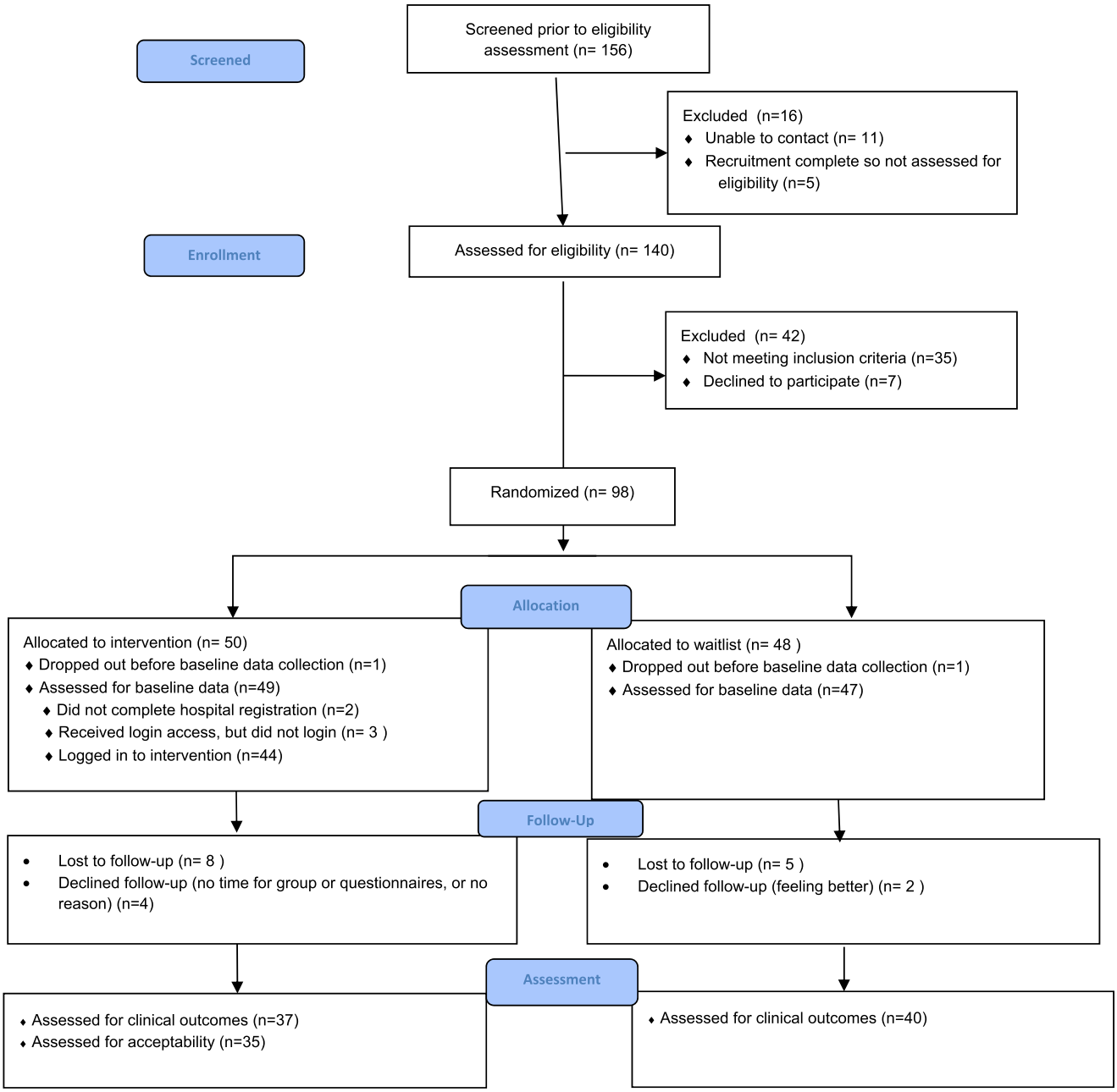

FIGURE 1 Consort extension for pilot and feasibility trials flow diagram

in the moderate range in both groups, with a mean (*SD*) 14.6 (4.45) in the intervention group and 15.1 (3.69) in controls. There were no clinically meaningful differences between the study groups.

In the intervention condition, 47/49 women who completed the baseline assessment also completed the hospital registration process, an institutional requirement for providing access to the platform. About 93.6% of these participants ($n = 44$) accessed the platform at least once, 79.5% of whom ($n = 35$) filled out the program evaluation questionnaire. The median number of logins per participant to the platform was three (range: 0–52; IQR: 2–7). Of the 44 women who logged in at least once, 42 (95.5%) posted at least once with a median of six posts (range: 0–35, IQR: 2–12). The weeks rated as most relevant to women were Week 1 ("Motherhood: A Time of Transition and Change") (mean: 4.23 out of 5, *SD*: 0.94), and Week 2 ("Emotional Changes: Mental Health") (mean: 4.46, *SD*: 0.78), followed by Weeks 4, 7, and 9 which all received mean scores of 4.11 out of 5. The lowest rated was Week 10 ("Saying goodbye and consolidating your coping skills") (mean: 3.54, *SD*: 0.98; Table S1).

Group cohesiveness ratings were high (Table 2). In the satisfaction survey, about 97.1% of women ($n = 34$) agreed that the content shared in the group was appropriate for their culture and background, and 85.7% ($n = 30$) agreed that they felt comfortable sharing information about themselves and discussing issues relevant to their experience (Table 3). About 65.7% ($n = 23$) agreed that *all* of their concerns were addressed by the group, and about 60% ($n = 21$) agreed that they felt more comfortable in the web-based group than they would have in an in-person

TABLE 1 Baseline demographic and clinical characteristics information, by treatment allocation, presented as *n* (%) unless otherwise specified

Variable	Intervention (*n* = 49)	Control (*n* = 47)
Mean age in years (*SD*)	33.4 (4.49)	32.6 (5.51)
Canadian-born[a]	40 (81.6)	37 (78.7)
Languages spoken in addition to English at home[b]	8 (16.3)	10 (21.3)
Married, cohabiting or common law	47 (95.9)	47 (100)
Completed university or college	39 (79.6)	37 (78.7)
Family annual income		
<$40,000 CAD	7 (14.4)	5 (10.7)
$40,000–80,000 CAD	10 (20.4)	7 (14.9)
>$80,000 CAD	29 (59.2)	29 (61.7)
Prefer not to say	3 (6.1)	6 (12.8)
Self-reported mental health history		
Ever diagnosed with depression	26 (53.0)	22 (46.8)
Ever diagnosed with anxiety	30 (61.2)	25 (53.2)
Current individual psychotherapy	17 (34.7)	11 (23.4)
Current medication for mental health concern	21 (42.8)	19 (40.4)
Antidepressant	16 (32.7)	14 (29.8)
Benzodiazepine or sleep aid	2 (4.08)	3 (6.38)
Other (e.g., mood stabilizer, antipsychotic)	2 (4.08)	1 (2.12)
Baseline clinical symptoms		
Edinburgh Postnatal Depression Scale, mean (*SD*)	14.6 (4.45)	15.1 (3.69)

Abbreviations: *SD*, standard deviation; CAD, Canadian dollars.

[a]Countries: Intervention group—Brazil, Ecuador, El Salvador, England, Hong Kong, India, Trinidad. Control group—China, Croatia, India, Romania, Slovakia, Trinidad, UK, US.

[b]Languages: Intervention group—Cantonese, French, Hindi and Gujarati, Hungarian, Portuguese, and Spanish. Control group—Cantonese, French, Greek, Punjabi, Romanian, Slovak, Spanish, and Tamil.

group. Most women (77.1%) appreciated that the forum was accessible to them at all hours. However, only 37% (*n* = 13) agreed that they were satisfied with their own and others' level of involvement in the group, and only 20% (*n* = 7) agreed that the weekly "live chat" hour was helpful. Free-text responses included technical suggestions for how to enhance interaction, reasons for non-use of the "live chat" hour (e.g., childcare or other responsibilities, *n* = 9; conflicting schedules, *n* = 4), and suggestions for additional topics (Table S2).

No adverse events were reported during the study.

TABLE 2 Group cohesion measured through items adapted from the group cohesion scale of the therapeutic factors inventory, in *N* (%) as rated on a 7-point Likert scale by immediate treatment condition participants (*n* = 35)

	Median	1: Not at all	2: A little bit	3: Somewhat	4: Moderate-ly	5: Quite a bit	6: A great deal	7: Extremely
Even though others may disagree with me sometimes, I feel accepted in the group	5	1 (2.90)	3 (8.60)	4 (11.4)	3 (8.60)	8 (22.9)	13 (37.1)	3 (8.60)
We cooperate and work together in a group	5	1 (2.90)	5 (14.3)	5 (14.3)	2 (5.70)	8 (22.9)	8 (22.9)	6 (12.8)
I feel accepted by the group	6	1 (2.90)	7 (20.0)	0	2 (5.70)	7 (20.0)	12 (34.3)	6 (17.1)
The members distrust each other[a]	1	30 (85.7)	3 (6.40)	1 (2.10)	0	0	1 (2.10)	0
I feel a sense of belonging in this group	4	3 (8.60)	6 (17.1)	6 (17.1)	5 (14.3)	4 (11.4)	7 (20.0)	4 (11.4)
I feel good about being a part of this group	5	2 (5.70)	5 (14.3)	4 (11.4)	5 (14.3)	7 (20.0)	7 (20.0)	5 (14.3)
Group members don't express caring for one another[a]	1	24 (68.6)	3 (8.6)	2 (5.7)	3 (8.6)	1 (2.9)	2 (4.3)	0
We trust each other in group	5	0	5 (14.3)	3 (8.6)	3 (8.6)	9 (25.7)	9 (25.7)	6 (17.1)
Even though we have differences, our group feels secure to me	6	0	4 (11.4)	5 (14.3)	2 (5.7)	6 (17.1)	9 (25.7)	9 (25.7)

[a]Reverse scored.

TABLE 3 Group satisfaction as rated on a 5-point Likert scale in *N* (%) as rated on a 7-point Likert scale by intervention participants (*n* = 35)

	1: Strongly disagree	2: Disagree	3: Not sure	4: Agree	5: Strongly Agree
The information on this website was appropriate for my culture and background	0	0	1 (2.90)	16 (45.7)	18 (48.6)
I had technical problems with this website	7 (20.0)	12 (34.3)	2 (5.70)	12 (34.3)	2 (5.70)
Overall, I found this website easy to use	0	7 (20.0)	3 (6.04)	16 (34.0)	9 (19.1)
The information on the website improved my knowledge about the transition to motherhood	2 (5.70)	4 (11.4)	6 (17.1)	13 (37.1)	10 (28.6)
Participating in this web-based support group was a positive and supportive experience	0	3 (6.04)	10 (28.6)	10 (28.6)	12 (34.3)
I felt comfortable sharing information about myself in the web-based support group	0	2 (5.70)	3 (6.04)	20 (57.1)	10 (28.6)
I felt comfortable discussing issues relevant to my experience in the web-based support group	0	2 (5.70)	3 (6.04)	18 (48.6)	12 (34.3)
I felt more comfortable discussing issues than I would in a face-to-face support group	3 (6.04)	4 (11.4)	7(20.0)	4 (11.4)	17 (48.6)
It was helpful to be able to access the web-based support group at any time of the day or night	0	4 (11.4)	4 (11.4)	11 (31.4)	16 (45.7)
I was satisfied with the level of involvement of the facilitators	1 (2.90)	2 (5.70)	6 (17.1)	10 (28.6)	16 (45.7)
I benefited from the input of the facilitators	2 (5.70)	1 (2.90)	9 (25.7)	11 (31.4)	12 (34.3)
I felt supported and heard by the facilitators	1 (2.90)	1 (2.90)	6 (17.1)	12 (34.3)	15 (42.9)
I was satisfied with the level of involvement of the group members	2 (5.70)	13 (37.1)	7(20.0)	7(20.0)	6 (17.1)
I benefited from the input of other group members	0	5 (14.3)	10 (28.6)	14 (40.)	6 (17.1)
I was satisfied with my own level of involvement in the web-based support group	4 (11.4)	14 (40.)	4 (11.4)	8 (22.9)	5 (14.3)
The group addressed my concerns about coping with the transition to motherhood	0	7 (20.0)	5 (14.3)	17 (48.6)	6 (17.1)
I feel better about myself as a mother as a result of participating in this group	0	9 (25.7)	9 (25.7)	9 (25.7)	8 (22.9)
I have a new perspective on my life as a mother as a result of participating in this group	0	8 (22.9)	10 (28.6)	10 (28.6)	7(20.0)
I have a new perspective on my baby as a result of participating in this group	0	11 (31.4)	9 (25.7)	9 (25.7)	6 (17.1)
Participating in this web-based group helped me improve my relationship with myself	0	11 (31.4)	6 (17.1)	12 (34.3)	6 (17.1)
Participating in this web-based group helped me improve my relationship with my baby	0	9 (25.7)	12 (34.3)	11 (31.4)	3 (6.04)
Participating in this web-based group helped me improve my relationship with my partner	0	12 (34.3)	13 (37.1)	9 (25.7)	1 (2.90)
Participating in this web-based group helped me improve my support system	0	12 (34.3)	12 (34.3)	10 (28.6)	1 (2.90)
The weekly live chat of the web-based support group was helpful	3 (6.04)	12 (34.3)	13 (37.1)	5 (14.3)	2 (5.70)
I would recommend this group to other women who are facing the transition to motherhood	0	2 (5.70)	8 (22.9)	10 (28.6)	15 (42.9)

3.2 | Clinical outcomes

The mean EPDS score decreased from 14.5 (*SD*: 4.07) to 11.3 (*SD*: 4.54) in the intervention condition and from 15.0 (*SD*: 3.56) to 12.0 (*SD*: 4.79) in controls for an adjusted mean difference (aMD) of −0.58 (95% CI: −2.68 to 1.52) (Figure 2). About 37.8% of women in the intervention group (14/37) had EPDS less than 10 at follow-up, compared to 10/30 (25.0%) in the control condition ($\chi^2 = 1.48$; $p = .224$). For those with a baseline EPDS score of 15 or less, the aMD was nonsignificant at 1.45 (−1.58 to 4.49) and the remission rate was similar between groups. Among women with a baseline EPDS score of 16 or more, the aMD was −3.66 (95% CI: −6.65 to −0.67) with a remission rate of 41.2% for those in the intervention condition in comparison to 10.5% in the control condition ($\chi^2 = 4.50$; $p = .055$).

4 | DISCUSSION

To our knowledge, this is the first evaluation of a therapist-facilitated asynchronous online group psychotherapy intervention for postpartum depression. We were able to rapidly recruit a diverse sample of women from across multiple regions of a large health jurisdiction into the trial, views of the intervention were positive with important feedback provided about how to optimize it further, and the preliminary efficacy results suggest that the intervention benefits women with a fairly high degree of depressive symptomatology. These results suggest that a larger definitive trial is warranted.

The literature on e-health interventions for postpartum mental health conditions, and for mental illness more generally is growing. Whereas no group-based psychotherapy interventions were identified in our literature search, a recent meta-analysis identified four randomized trials of internet-delivered psychological interventions for clinical depression in postpartum women (Loughnan et al., 2019). The interventions, ranging from 6 to 15 sessions, were generally structured with women completing internet-based cognitive behavioral or behavioral activation modules, and receiving coaching support from either graduate psychology trainees or mental health specialists (e.g., psychologists or other qualified mental health professionals). Three interventions included peer-led discussion boards, but not therapist-led group discussions. These studies, three of which had a sample size under 100 women, demonstrated variable treatment engagement and attrition rates; in the largest study to date ($n = 913$ women) about 80% dropped out from online sign-up to randomization, and up to 40% dropped out between baseline and posttreatment assessment (O'Mahen et al., 2013). Effects on depression compared to waitlist control or treatment as usual conditions were overall in the moderate range (Hedges *g* approximately 0.60) (Loughnan et al., 2019). As such, the relatively high level of engagement observed with the Mother Matters platform in the current study, and the fairly large effect size in women with moderate to severe symptoms at baseline—almost a 4-point difference in EPDS scores between the groups—are both extremely promising when considered in the context of this current literature.

The fairly high level of engagement with Mother Matters, compared to some of these other studies, might be attributed to several factors. First, there was significant attention to the on-boarding of participants and education about group norms and expectations.

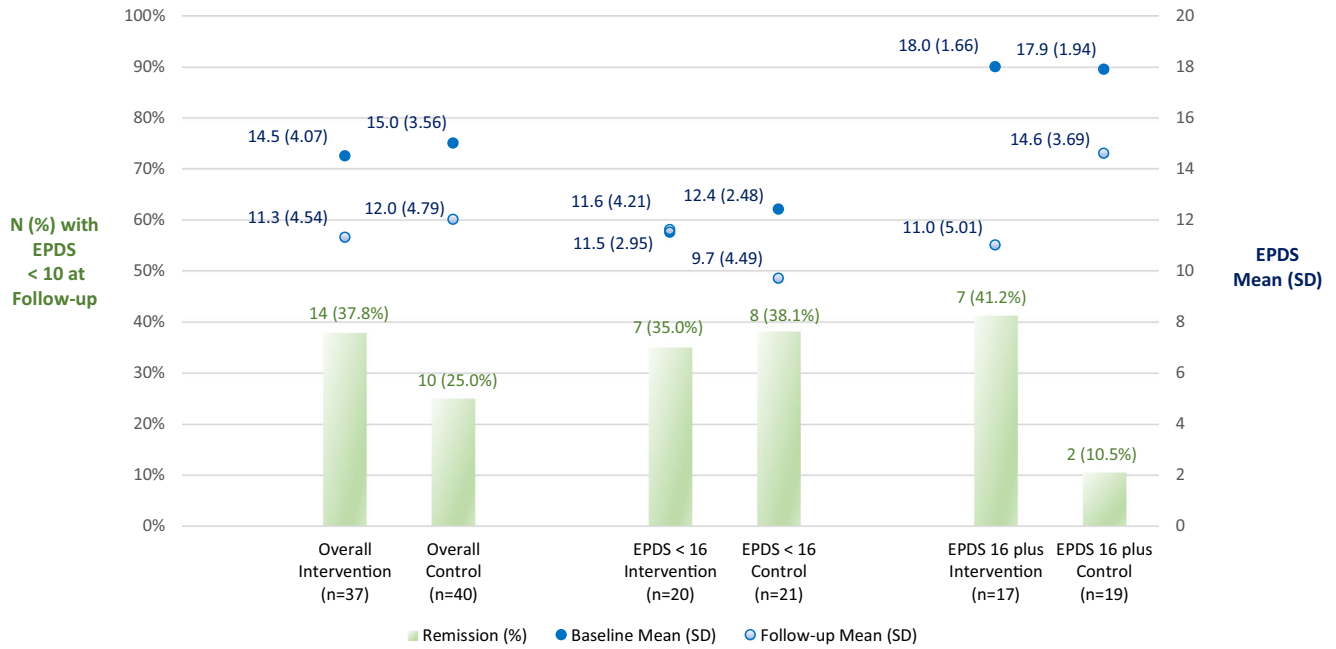

FIGURE 2 Postpartum depression outcomes, comparing Edinburgh Postnatal Depression Scale (EPDS) scores between intervention and control conditions (blue dots), and *N* (%) of women in intervention and control conditions in remission (EPDS < 10) immediately posttreatment (green bars)

Second, the topics addressed were highly relevant to the participants, with the majority of women reporting that *all* their concerns were addressed in Mother Matters. Third, group cohesiveness was quite high. Women indicated that they felt comfortable sharing in the forum and felt supported by the facilitators. Interestingly, many indicated that they were more comfortable than they would have been in an in-person group. About 60% reported that they shared more than they would have in an in-person or "live" group, supporting a unique role for this asynchronous type of intervention.

A low-intensity psychological intervention such as Mother Matters might be expected to mainly exert its effect among women with milder symptomatology, but individuals with more severe illness may respond equally well to psychological interventions (Furukawa et al., 2017). The observation that the treatment effect appeared to be exerted primarily in women with moderate to severe symptoms is consistent with other depression treatment trials where the separation between intervention and control groups tends not to be large at low baseline symptom severity given that controls with low levels of symptoms often improve with time (Fournier et al., 2010). The current study was not designed to identify the mechanisms that underlie the efficacy of the treatment. For example, one possible mechanism of action, in this case, is that the intervention improved knowledge about postpartum depression and its treatments or reduced shame or stigma around mental illness or mental illness treatments, leading to increased uptake of additional evidence-based interventions, especially for those who require higher intensity services. Regardless of the mechanism for improvement, a 40% remission rate in the higher-severity group for such a low resource-intensity intervention is notable. A future trial should be designed to explore various mechanisms for treatment effect, so as to understand how best an intervention such as Mother Matters can be implemented and improved upon.

There were several strengths to the conduct of the current study. For example, recruitment was rapid, and follow-up rates were reasonable. It was encouraging that a diverse sample of women was recruited. About one in five individuals who give birth in Ontario are born outside of Canada (Vigod et al., 2016), consistent with our study sample, suggesting good generalizability to the target population. Although the intervention was only provided in English as this was a pilot study, it was encouraging that no one interested in the study was excluded due to difficulty with English despite English being a second language to some. Furthermore, almost all participants indicated that the group felt culturally acceptable and appropriate. Some limitations herein are those inherent to a pilot study, in that the sample size is not sufficient to make claims about efficacy, and that data are not available to fully understand potential mediators or moderators of treatment outcome. For example, a support group can reduce symptoms on its own, can function to reduce shame and stigma leading to increased uptake of other services, or otherwise facilitate needed access to care. In a population where as few as 20% receive the care required for remission (Byatt et al., 2016), the latter indirect mechanisms may be just as important as the former and should be explored in future research with this intervention.

Other limitations were noted that are key areas for improvement in a future larger study. First, there were a number of people who had to wait several weeks between enrollment and starting the group, which may have increased the chances of drop-out, so deciding on a maximum time from recruitment to group start date might be helpful in a future study. Second, only a very small proportion (20%) of participants liked the weekly live chat option. Participants indicated that nonparticipation was due to other competing demands preventing them from adhering to a specific "time" for therapy, further supporting the benefits of asynchronous care in this population. This finding is consistent with one of the internet-based CBT studies described above where only 7% used an optional "chat" function (O'Mahen et al., 2013). Third, just under 40% of participants indicated that they were satisfied with their own level of involvement in the group, and that of other participants. They provided specific suggestions about how to increase forum activity, including setting a maximum post length, providing notification options when there were new posts, and developing a mobile version to increase participation when individuals are not at their computers. It is important to highlight that these data were collected in 2016. Given the massive increase in the use of mobile technology and the development of web-based and online applications since the platform was originally developed—especially with the substantial increase in the use of virtual care and e-health interventions that have been developed since the onset of the COVID-19 pandemic—these modifications, would likely be essential to ensure uptake and utilization in a future trial. For future implementation and sustainability, it is likely that the technical features of an e-health intervention such as this one will have to evolve iteratively with user expectations over time.

In conclusion, Mother Matters represents a promising novel e-health intervention for postpartum depression. It is delivered in a group format, increasing the potential for efficiency more than individual-level interventions as the latter still require individual 1:1 coaching, and allowing for the benefits of being part of a group. Incorporating the multiple learnings from this pilot with respect to recruitment, retention and platform optimization, a future definitive randomized trial is highly feasible. Further evaluation of the efficacy and cost-effectiveness of Mother Matters will provide key evidence to drive efforts to increase access to timely, effective postpartum mental health care.

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CONFLICT OF INTERESTS

Dr. Vigod reports royalties from UpToDate Inc., for authorship of materials on depression and pregnancy. Dr. Grigoriadis reports royalties

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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