One-Day Online Cognitive Behavioral Therapy–Based Workshops for the Prevention of Postpartum Depression:

A Randomized Controlled Trial

Zoe Boland, MSc; Nancy Lloyd, MSc; Jaslyn Drage, BSc; Jesus Serrano-Lomelin, PhD; Peter Bieling, PhD; David Streiner, PhD; and Ryan J. Van Lieshout, PhD, MD

Abstract

Background: Postpartum depression (PPD) affects up to 1 in 5 birthing parents and is associated with more future depressive episodes. We aimed to determine if PPD could be prevented with online 1-day cognitive behavioral therapy (CBT)–based workshops.

Methods: This randomized controlled trial enrolled pregnant persons at 28–38 weeks gestation at increased risk for PPD, living in Ontario and free of current *DSM-5* major depressive disorder (MDD). Participants received the workshop plus treatment as usual (TAU; experimental group) or TAU alone (control group). We assessed MDD diagnosis, levels of PPD symptoms, anxiety, social support, mother-infant relationship, and infant temperament at 1, 2, and 3 months postpartum. The primary outcome was MDD at 3 months postpartum assessed using the Mini-International Neuropsychiatric Interview.

Results: Since <10% of participants developed MDD, trial recruitment was stopped early. Data were collected up to 2 months postpartum in those already enrolled. Among these participants (n = 124), reductions in Edinburgh Postnatal Depression Scale (EPDS) scores were seen in the experimental group at 2 months but were not statistically significant ($P = .06$). Higher risk participants (baseline EPDS ≥7) in the experimental group showed larger, statistically significant reductions ($P<.05$) in PPD and anxiety at 2 months postpartum.

Limitations: Eligibility criteria resulted in a sample that did not develop MDD at rates high enough to continue the trial and limited study statistical power.

Conclusions: Definitive conclusions regarding the effectiveness of online 1-day workshops for preventing PPD are not possible, but these results may warrant future testing with a higher risk sample.

Trial Registration: ClinicalTrials.gov identifier: NCT05753176.

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Author affiliations are listed at the end of this article.

Postpartum depression (PPD) affects 1 in 5 birthing parents[1] and costs up to $150,000 per case over the lifespan.[1,2] It is associated with future depressive episodes, and more cognitive and emotional problems in offspring.[3] The primary risk factors for PPD are high stress, lack of social support, current or past abuse, prenatal depression, and marital or partner dissatisfaction, with the strongest being prenatal depression and current abuse.[4] A separate systematic review[5] identified depression or anxiety during pregnancy, a past history of psychiatric illness, stressful life events, and low levels of social support as key antenatal risk factors for PPD.

Despite its high prevalence and adverse effects, healthcare systems remain poorly equipped to handle PPD, with as few as 10% of individuals receiving evidence-based treatment.[6,7] Significant barriers to PPD treatment exist. Birthing parents can be reluctant to use medication, fearing potential adverse effects.[8,9] Current psychotherapeutic interventions are often difficult to access, with publicly funded options having lengthy waitlists and requiring on average 8 or more weekly sessions.[10] Additionally, pregnant persons can face judgment, stigma, and fears of child protective services and/or welfare involvement, which hinder disclosure to professionals.[6,11] It is therefore

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Clinical Points

- It is recommended that those at high risk for postpartum depression (PPD) be provided preventive counseling interventions, yet evidence-based clinical options are rare.
- For patients with baseline Edinburgh Postnatal Depression Scale scores ≥7, online 1-day cognitive behavioral therapy–based workshops may reduce PPD symptoms.

important that interventions aimed at preventing PPD are developed.

PPD is ideal for prevention due to its high prevalence, clear window for intervention (pregnancy), and easily identifiable risk factors. Even though universal preventive programs may not be effective, the United States Preventive Services Task Force recommends those at high risk for PPD be provided with preventive counseling interventions.[12] Despite this, there is substantial heterogeneity among studies in defining high-risk populations, and in the characteristics and effectiveness of existing interventions. While most of the trials informing the recommendation favored intervention over control conditions, just 5 showed statistically significant effects in their meta-analysis.[13–17] Of these, most utilized cognitive behavioral therapy (CBT) or interpersonal psychotherapy–based interventions of 4–9 weekly sessions delivered individually or in small groups in-person. Samples were generally small and at very high-risk, predominantly consisting of recent immigrants, or black or Hispanic participants with low income, and/or on public assistance. Relatively high attrition rates suggested that less time-consuming treatments could optimize compliance.

Trials of preventive interventions are conducted since these recommendations have been limited. A systematic review of 16 app-based interventions found few to be effective.[18] Of these,[19–22] most lasted 4–12 weeks, were administered postnatally, and recruited urban-dwelling, well-educated, primiparous participants from hospitals in China and Singapore. Most were limited by small sample sizes, and some lacked control groups. A more recent large randomized clinical trial (RCT) (n = 5,017) comparing a mobile app added to treatment as usual (TAU) was not effective.[23]

Effective counseling interventions have tended to be effective in specific, very high-risk groups, and their duration, timing, and intensity (eg, multiple sessions over weeks) make completion challenging for many pregnant people, particularly those working outside of the home. Attrition is also an issue for multisession counseling interventions, as it can be for app-based interventions, particularly those without therapist support.

Considering these gaps, safe, novel, and efficient preventive interventions are needed. The delivery of very brief psychotherapeutic interventions (eg, lasting 1 day) in large groups (ie, up to 30 people) is a newer phenomenon, particularly in perinatal mental health. While much of the literature on single session interventions has focused on youth mental health, they may be effective for improving symptoms of depression in adults. Moreover, 1-day CBT-based workshops for treating PPD have proven effective when delivered by professionals and peers in-person or online.[24–27] A recent pilot study also suggested that a newly developed 1-day CBT-based workshop for preventing PPD was acceptable to participants and supported the conduct of a larger randomized controlled trial.[28]

Given this background, the primary objective of this study was to determine if an online 1-day CBT-based workshop for preventing PPD added to TAU was more effective than TAU alone at preventing PPD at up to 3 months postpartum. We also examined its impact on anxiety, social support, the mother-infant relationship, and infant temperament.

METHODS

Trial Design and Setting

This trial was a parallel-group RCT conducted in Ontario, Canada. Participants were randomly allocated in a 1:1 ratio to experimental (workshop plus TAU) or control (TAU alone) groups. TAU was defined as any healthcare services that participants accessed during the study (eg, medication, psychotherapy, etc.). Healthcare in Ontario is paid for by the province.

Blocked randomization with block sizes of 4, 6, and 8 was used (block sizes remained confidential). In the current study, data were to be collected from participants at baseline (T1) and at 1 (T2), 2 (T3), and 3 (T4) months postpartum using Research Electronic Data Capture (REDCap).[29] The study was approved by the Hamilton Integrated Research Ethics Board (approval #13351) and registered at ClinicalTrials.gov (ID: NCT05753176).

Participants

Participants were recruited via social media (eg, Facebook) posts and advertising, and through Ontario public health units. Research staff conducted the eligibility screening through REDCap and over the phone. Pregnant persons were eligible if they were ≥18 years old, 28–38 weeks gestation at the time of the workshop, fluent in English, and without current major depressive disorder (MDD). This period was chosen to attempt to optimize skill use in the time leading up to and immediately following delivery. The application of interventions in the third trimester is also consistent with

several previously effective studies.[14,17,21,30–33] Participants also had to be at increased risk for PPD defined as ≥1 of the following: score ≥23 on the Antenatal Risk Questionnaire,[34] a history of MDD or generalized anxiety disorder (GAD), an income below the Canadian low-income cutoff, single marital status, poor social support, a history of physical and/or sexual abuse, and/or a major life stressor within the last 12 months. Individuals with current MDD, a current or past diagnosis of bipolar disorder, hypomania, alcohol use disorder, substance use disorder, borderline personality disorder, and/or psychosis were excluded.

Intervention

A novel prevention-specific workshop (differing from our previous 1-day CBT-based treatment workshop[22]) was developed for this study. This intervention consisted of a 6-hour interactive workshop based on CBT principles and was developed by a perinatal psychiatrist (RJV). The workshop spans 7 hours (from 09:00 to 16:00) and contains 2 15-minute breaks and 1 half-hour lunch break. The intervention consists of 4 modules: (1) PPD etiology, focusing on modifiable risk factors; (2) cognitive skills (eg cognitive restructuring); (3) behavioral skills (eg problem-solving, behavioral activation); and (4) developing a personalized prevention plan based on participants' risk profile and skills. The workshop incorporates various teaching methods, including didactic sections, group exercises, and role-plays. This workshop is an adaptation and extension of the research team's previously successful 1-day CBT-based workshops for treating PPD,[26] with a focus on prevention as opposed to treatment. Changes included additional content on sleep and increased emphasis on action planning. The final version of the workshop was delivered in the pilot feasibility study and the RCT, with delivery by a single individual (psychiatrist) in the pilot study, and trained professionals in pairs in the RCT.

Two public health nurses, 3 social workers, 1 registered psychotherapist, and 1 psychiatrist were trained to deliver the workshops. The facilitators received in-classroom training with 2 days of didactic teaching/role plays and then delivered a workshop to mock participants (trained students). We assessed fidelity using adherence and competence checklists developed specifically for this study during the training based on those used in a previous study of CBT for PPD.[35] Facilitators had to demonstrate adequate to good coverage of all workshop items on the adherence checklist and good or better on all competence items before delivering workshops in the study. Workshops were delivered by pairs of facilitators via Zoom and took place on Saturdays from December 2022 to April 2023.

Postworkshop emails were sent weekly for 4 weeks, and then at 6, 8, and 12 weeks, reminding participants to practice their skills. Control group participants received emails at the same timepoints, suggesting they should seek help and providing resources including clinical practice guidelines for perinatal depression.[36]

Outcomes

Our primary outcome was the development of current MDD at T3 assessed using the Mini-International Neuropsychiatric Interview (MINI).[37] The MINI is a structured diagnostic interview used to identify psychiatric disorders using *DSM-5* criteria. The interview was conducted via telephone by study staff blind to participant group status and was to be administered at all timepoints. All remaining outcomes were collected by REDCap.

Secondary outcomes included levels of PPD symptoms, anxiety, social support, mother-infant relationship quality, and infant temperament. All were assessed at all timepoints except the mother-infant relationship and infant temperament (measured postpartum).

Levels of PPD symptoms were assessed using the Edinburgh Postnatal Depression Scale (EPDS) (Cronbach $\alpha = .83$).[38] The EPDS is a validated 10-item measure that assesses symptoms during the previous week. Items are scored on a 4-point scale (0–3) with a total score from 0–30.

Anxiety was assessed using the GAD-7 scale (Cronbach $\alpha = .86$), a 7-item self-report measure of symptoms of GAD.[39] It has been validated in postpartum samples.[40]

The Multidimensional Scale of Perceived Social Support (Cronbach $\alpha = .94$)[41] is a 12-item measure of adequacy of social support (eg, "I have a special person who is a real source of comfort to me") using a 5-point Likert scale. Higher scores indicate higher perceived adequacy of social support.

The Postpartum Bonding Questionnaire is a 25-item maternal-report scale assessing mother-infant relationship quality (Cronbach $\alpha = .90$).[42] Positive statements (eg "I enjoy playing with my baby") are scored from 0 ("always") to 5 ("never"). Negative statements (eg "I am afraid of my baby") are scored from 5 ("always") to 0 ("never"). It includes 4 subscales: impaired bonding, rejection and pathological anger, infant-focused anxiety, and incipient abuse. The incipient abuse scale was not examined due to its low sensitivity.

The Infant Behavior Questionnaire-Revised Very Short Form is a 37-item measure assessing infant temperament (Cronbach $\alpha = .85$).[43] Parents report the frequency with which their infants have enacted specific behaviors in common situations over the past week on a 7-point scale. Three factors are assessed: positive affectivity/surgency, negative emotionality, and orienting/regulatory capacity.

Sociodemographic characteristics of the sample (eg age, ethnicity, marital status) were collected at T1.

The Client Satisfaction Questionnaire-8 (CSQ-8) assessed workshop participant satisfaction (Cronbach α = .85).[44] The CSQ-8 is a validated 8-item measure assessing outpatient services satisfaction. Each item is scored on a 4-point scale with scores of 8–20 indicating low levels, 21–26 indicating moderate levels, and 27–32 indicating high levels of satisfaction. It was completed by workshop attendees' 1-week postintervention.

Sample Size and Statistical Analyses

The trial was powered to detect a treatment effect size of $d = 0.3$, with a 2-sided P value = .05 and 80% power. Anticipating an attrition rate of 15%, the target sample size was n = 410 (205 per arm). The sample size calculation was conducted using repeated measure and sample size.[45]

Originally, multilevel mixed-effects regression models using the restricted maximum likelihood method were to be employed to examine all study outcome trajectories. Contrasts were to be used to determine differences between experimental and control groups at each timepoint with a 2-level hierarchy to nest outcomes at each point (T1–T4) within each individual participant. Predicted means with 95% CIs were to be reported for each group. Marginal effects postestimation tests with Bonferroni correction for 95% CIs and P values were to estimate outcome changes between experimental and control groups at each timepoint, as well as differences at follow-up points compared to baseline.

Dichotomous outcomes were to be analyzed using generalized estimating equations (GEEs) with a binomial logit-link binomial distribution and an AR1 covariance structure. These models estimate odds ratios between groups at each timepoint, directly modeling change in odds in a repeated-measures design.

Originally, data collection for participants was to occur until T4. However, given the inconsistency in the literature in defining samples at high risk for PPD, we implemented an a priori stopping rule because lack of sufficient MDD development would result in an inability to test our primary hypothesis. The stopping rule was to be applied at 1 month postpartum and was defined as <10% of the sample developing MDD when 25% of the planned sample was recruited (n = 124). Since this threshold was not reached (just 2 participants developed MDD by T2), recruitment was stopped. However, since most participants had completed T2 and T3 data collection at the time of implementation, data at these timepoints were collected for all 124 participants and analyses were conducted. A post hoc subgroup analysis was also conducted for participants with baseline EPDS scores ≥7 (elevated levels of symptoms of depression, one of the strongest pregnancy risk factors for developing PPD).[46] We ultimately did not use GEEs with a binomial logit-link binomial distribution and an AR1 covariance structure as we were no longer analyzing dichotomous outcomes. The rest of the planned analyses were conducted.

RESULTS

Figure 1 displays participant flow through the study. Recruitment occurred from October 2022 to April 2023. 781 participants completed the initial screening questionnaire, and 254 participants were deemed eligible and were asked to complete the MINI. 174 participants completed the MINI, and 124 participants were randomized into the experimental (n = 62) or control group (n = 62). 123 participants completed the baseline questionnaire. Baseline characteristics in experimental and control groups are shown in Table 1. Table 2 shows the baseline characteristics of the EPDS ≥7 and the EPDS <7 groups. Table 3 displays the trajectories of scale scores for all participants in the study along with estimated group differences at each timepoint.

In analyses examining outcomes for all participants (n = 124), no statistically significant differences were observed between the experimental and control groups. A decrease in EPDS scores at T3 in the experimental group was noted but was not statistically significant ($P = .06$). There was a statistically significant reduction in the EPDS score at T3 compared to baseline within the experimental group (difference = −1.3, 95% CI, −2.5 to −0.1).

The results of a separate analysis on participants who had baseline (T1) EPDS scores ≥7 are shown in Table 4. For those with a baseline EPDS score ≥7, EPDS score reductions were larger in the experimental group at T3 ($P = .03$), as were GAD-7 scores ($P = .04$).

Mean CSQ-8 score of workshop participants was 27.52, indicative of high satisfaction.

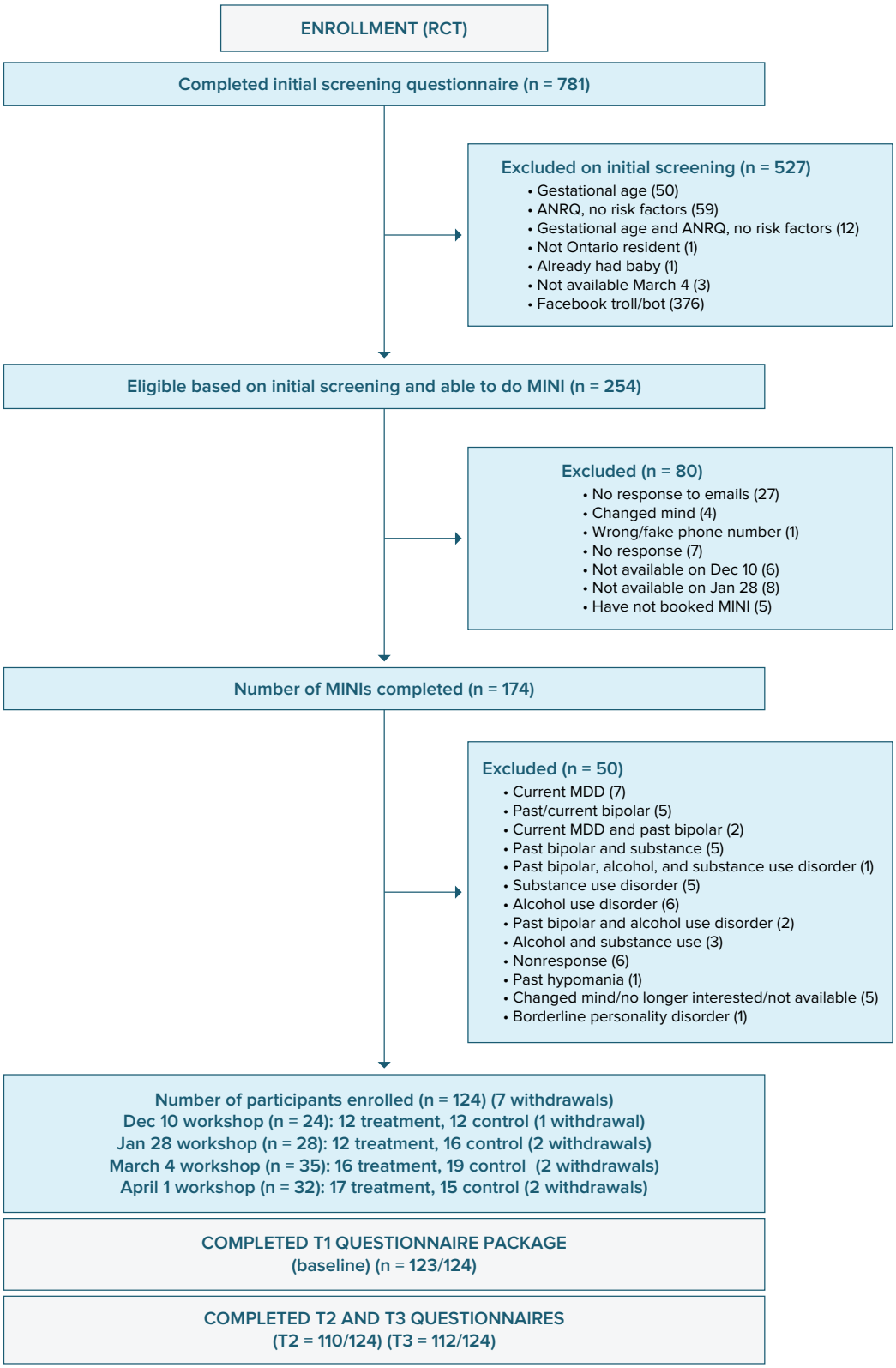
DISCUSSION

Since few participants developed MDD, a stopping rule was triggered at T3, and we report the results of the analyses of the 124 participants recruited up to that point. In this sample, a small reduction in EPDS score was noted at T3, but this was not statistically significant ($P = .06$). A higher risk subsample of participants (EPDS scores ≥7) who received the workshop had lower EPDS ($P = .03$) and GAD-7 ($P = .04$) scores at T3.

While it is unclear why so few participants developed MDD, it is likely that the selected risk criteria failed to

Figure 1.

Flowchart of Participants Throughout the Study



Abbreviations: ANRQ = Antenatal Risk Questionnaire, MDD = major depressive disorder, MINI = Mini-International Neuropsychiatric Interview, RCT = randomized controlled trial.

Table 1.

Baseline Characteristics of Study Participants[a]

Characteristic	Experimental (n = 62)	Control (n = 62)
Maternal age, y	32.9 (5.0)	32.0 (4.5)
Marital status, n/total n (%)		
Single	6 (9.8)	6 (9.7)
Married/common law	55 (90.2)	56 (90.3)
Ethnicity, n/total n (%)		
White	40 (65.6)	45 (72.6)
Nonwhite	21 (34.4)	17 (27.4)
Latino/Hispanic	2 (3.3)	0
Middle Eastern	3 (4.9)	1 (1.6)
African	2 (3.3)	2 (3.2)
Caribbean	1 (1.6)	1 (1.6)
South Asian	4 (6.6)	7 (11.3)
East Asian	3 (4.9)	2 (3.2)
Indigenous	2 (3.3)	0
Mixed	2 (3.3)	3 (4.8)
Other	2 (3.3)	1 (1.6)
Education, y	15.6 (2.4)	15.8 (1.7)
Income support, yes n/total n (%)	2 (3.3)	5 (8.1)
Household status		
Rent	21 (34.4)	20 (32.3)
Own	40 (65.6)	42 (67.7)
Occupational status		
Employed full-time	40 (65.6)	38 (62.3)
Employed part-time	5 (8.2)	3 (4.9)
Unemployed	5 (8.2)	5 (8.2)
Student	7 (11.5)	6 (9.8)
On leave	4 (6.6)	9 (14.7)
Gestational age, wk	30.6 (3.1)	30.5 (3.1)
Antidepressant use (current), yes n/total n (%)	11 (17.7)	12 (19.3)
Counseling in past 3 mo, yes n/total n (%)	13 (21.0)	13 (21.0)
Past major depressive disorder (MINI), n/total n (%)	47 (75.8)	49 (79.0)
EPDS score (baseline)	8.4 (4.7)	9.1 (5.1)
GAD-7 score (baseline)	5.2 (4.0)	6.4 (4.7)

[a]Values are shown as mean (SD) unless otherwise noted. In variables with missing values, n is indicated (n = #).
Abbreviations: EPDS = Edinburgh Postnatal Depression Scale, GAD-7 = Generalized Anxiety Disorder 7-item scale, MINI = Mini-International Neuropsychiatric Interview.

Table 2.

Baseline Characteristics of Study Participants With EPDS Scores ≥7 and <7[a]

Characteristic	EPDS ≥7, n = 79	EPDS <7, n = 44
Gestational age, wk	30.6 (3.1)	30.4 (3.1)
Marital status, n/total n (%)		
Single	8 (10.1)	4 (9.1)
Married/common law	71 (89.9)	40 (90.9)
Ethnicity, n/total n (%)		
White	52 (65.8)	33 (75.0)
Nonwhite	27 (34.2)	11 (25.0)
Household status, n/total n (%)		
Rent	29 (36.7)	12 (27.3)
Own	50 (63.3)	37 (72.7)
Occupational status, n/total n (%)		
Employed full-time	48 (60.8)	34 (77.3)
Counseling use (past 3 mo), yes, n/total n (%)	19 (24.1)	7 (15.9)
EPDS score (baseline)	11.5 (3.8)	3.8 (1.7)

[a]Values are shown as mean (SD) unless otherwise noted. In variables with missing values, n is indicated (n = #).
Abbreviation: EPDS = Edinburgh Postnatal Depression Scale.

Table 3.

Predicted Outcome Means and Mean Differences for All Participants (n = 124)

	Time	Experimental Mean (95% CI)	Control Mean (95% CI)	Mean difference (95% CI)	*P*
EPDS	T1	8.3 (7.4–9.2)	9.1 (8.3–10.0)	−0.8 (−2.3 to 0.7)	.58
	T2	8.3 (7.4–9.3)	8.9 (8.0–9.8)	−0.6 (−2.1 to 1.1)	.41
	T3	7.0 (6.0–7.9)	8.2 (7.3–9.1)	−1.2 (−2.5 to 0.1)	.06
GAD-7	T1	5.6 (4.8–6.4)	6.1 (5.4–6.9)	−0.5 (−1.9 to 0.8)	.99
	T2	5.9 (5.0–6.7)	6.5 (5.7–7.3)	−0.6 (−2.0 to 0.8)	.83
	T3	5.1 (4.3–6.0)	6.1 (5.3–6.9)	−1.0 (−2.3 to 0.5)	.31
Social support	T1	5.4 (4.7–5.5)	5.8 (5.5–6.1)	−0.4 (−0.9 to 0.1)	.12
	T2	5.7 (5.4–6.0)	5.9 (5.6–6.2)	−0.2 (−0.7 to 0.3)	.83
	T3	5.5 (5.2–5.8)	5.9 (5.6–6.2)	−0.4 (−0.9 to 0.1)	.18
PBQ infant bonding	T2	15.3 (13.9–16.6)	15.2 (13.9–16.5)	0.1 (−2.1 to 2.3)	.95
	T3	14.7 (13.3–16.1)	14.5 (13.1–15.8)	0.2 (−1.9 to 2.4)	.81
PBQ infant focused anxiety	T2	5.9 (5.2–6.6)	5.9 (5.2–6.6)	0.0 (−1.1 to 1.1)	.95
	T3	5.3 (4.6–6.0)	5.2 (4.6–5.9)	0.1 (−1.0 to 1.2)	.87
PBQ rejection and pathological anger	T2	8.2 (7.4–9.0)	8.1 (7.3–8.9)	0.1 (−1.2 to 1.4)	.83
	T3	7.8 (7.0–8.6)	7.7 (7.0–8.5)	0.1 (−1.2 to 1.3)	.90
IBQ-R surgency	T2	5.1 (4.7–5.4)	5.4 (5.1–5.8)	−0.3 (−0.9 to 0.2)	.29
	T3	5.1 (4.8–5.5)	5.2 (4.9–5.6)	−0.1 (−0.6 to 0.5)	.99
IBQ-R negative affectivity	T2	4.7 (4.4–5.0)	4.9 (4.6–5.2)	−0.2 (−0.7 to 0.4)	.95
	T3	4.6 (4.3–4.9)	4.6 (4.3–4.9)	0.0 (−0.6 to 0.5)	.99
IBQ-R regulation/emotional control	T2	5.6 (5.4–5.9)	5.8 (5.5–6.0)	−0.2 (−0.5 to 0.3)	.81
	T3	5.9 (5.6–6.1)	5.8 (5.6–6.0)	0.1 (−0.3 to 0.5)	.99

Abbreviations: EPDS = Edinburgh Postnatal Depression Scale, GAD-7 = generalized anxiety disorder 7-item scale, IBQ-R = Infant Bonding Questionnaire-Revised, PBQ = Postpartum Bonding Questionnaire.

generate a sample at high enough risk. It is possible that access to TAU with universally available healthcare and the small number of individuals facing significant disadvantage (socioeconomic or otherwise) played a role. Regardless, this low MDD rate makes it difficult to assess the clinical impact of the workshop.

While a statistically significant reduction in PPD symptoms in our full sample was not detected, we were only able to analyze 25% of it and so may not have had adequate statistical power. Moreover, participants in both groups used antidepressants and psychotherapy which may have reduced PPD risk.

Effective counseling interventions from previous RCTs utilized samples from specific socioeconomic backgrounds that were often at a higher psychosocial risk than ours[15,16] and consisted of a larger number of sessions delivered individually or in smaller groups. It remains unclear if the dosage and/or content of our intervention is sufficient to prevent PPD, and/or with whom. However, the workshops could help reduce PPD and anxiety in those with EPDS scores ≥7 at baseline. This group may be at higher risk because they already have symptoms, providing more room for improvement and/or increased motivation to utilize workshop strategies.

There has been significant heterogeneity in defining at-risk PPD populations in previous trials which is a challenge for RCTs of prevention, their generalizability, and their clinical applicability. Indeed, the United States Preventive Services Task Force recommendation notes a lack of information on the most effective way to identify at-risk individuals.[12] As such, future studies should carefully consider at-risk criteria and examine the impact of these in their sample on outcomes. For example, interventions in studies that recruited those facing significant socioeconomic disadvantage and members of equity-deserving groups in settings with limited healthcare access tended to show more positive results of preventive interventions than those that did not. Additionally, studies should ensure the outcomes they select are important to their participants, clinicians, healthcare systems, and society. For example, since PPD may exist on a continuum of severity with important implications for them and their offspring, the use of continuous measures like the EPDS can increase statistical power and potentially optimize clinical relevance.

In terms of limitations, we did not recruit our full sample as too few participants developed MDD, limiting statistical power. The sample consisted of birthing parents living in Ontario, and most were white and

Table 4.

Predicted Outcome Means and Mean Differences for Participants With EPDS Score ≥7 at Baseline (n = 79)

	Time	Experimental Mean (95% CI)	Control Mean (95% CI)	Mean difference (95% CI)	*P*
EPDS	T1	11.0 (9.9–12.1)	12.0 (10.9–13.1)	−1.0 (−2.6 to 0.6)	.21
	T2	9.3 (8.1–10.6)	10.1 (9.0–11.3)	−0.8 (−2.5 to 0.9)	.34
	T3	7.7 (6.5–9.0)	9.6 (8.5. 10.8)	−1.9 (−3.6 to −0.2)	.03
GAD-7	T1	7.2 (6.0–8.5)	8.5 (7.2–9.7)	−1.2 (−3.3 to 0.9)	.48
	T2	6.4 (5.0–7.7)	7.9 (6.6–9.2)	−1.5 (−3.8 to 0.7)	.31
	T3	6.0 (4.6–7.3)	7.8 (6.6–9.1)	−1.8 (−3.7 to −0.05)	.04
Social support	T1	5.1 (4.7–5.5)	5.5 (5.2–5.9)	−0.4 (−1.0 to 0.2)	.30
	T2	5.5 (5.1–5.9)	5.7 (5.3–6.0)	−0.2 (−0.8 to 0.5)	.99
	T3	5.5 (5.1–5.8)	5.7 (5.4–6.1)	−0.2 (−0.9 to 0.4)	.85
PBQ infant bonding	T2	16.2 (14.5–18.1)	15.3 (13.7–17.0)	0.9 (−1.8 to 3.7)	.91
	T3	15.7 (14.0–17.5)	14.4 (12.8–16.1)	1.3 (−1.5 to 4.1)	.58
PBQ infant focused anxiety	T2	6.2 (5.2–7.1)	6.0 (5.1–6.8)	0.2 (−1.3 to 1.7)	.99
	T3	5.7 (4.8–6.6)	5.3 (4.4–6.2)	0.4 (−1.1 to 1.9)	.99
PBQ rejection and pathological anger	T2	8.8 (7.7–9.8)	8.1 (7.1–9.1)	0.7 (−1.0 to 2.3)	.76
	T3	8.2 (7.2–9.3)	7.9 (6.9–8.9)	0.3 (−1.4 to 1.9)	.99
IBQ-R surgency	T2	5.3 (4.9–5.7)	5.7 (5.4–6.1)	−0.4 (−1.1 to 0.2)	.25
	T3	5.2 (4.8–5.6)	5.3 (4.9–5.7)	−0.1 (−0.7 to 0.6)	.99
IBQ-R negative affectivity	T2	4.8 (4.3–5.2)	5.1 (4.8–5.5)	−0.3 (−1.0 to 0.3)	.40
	T3	4.7 (4.3–5.2)	4.8 (4.4–5.2)	−0.1 (−0.7 to 0.6)	.99
IBQ-R regulation/emotional control	T2	5.5 (5.1–5.8)	5.9 (5.6–6.2)	−0.4 (−0.9 to 0.1)	.13
	T3	5.8 (5.5–6.1)	5.7 (5.4–6.0)	0.1 (−0.4 to 0.6)	.99

Abbreviations: EPDS = Edinburgh Postnatal Depression Scale, GAD-7 = generalized anxiety disorder 7-item scale, IBQ-R = Infant Bonding Questionnaire-Revised, PBQ = Postpartum Bonding Questionnaire.

married, graduated high school, and had access to universal healthcare which could limit the generalizability of our results. It is also important to note that all outcomes were self-reported by participants. As we only assessed outcomes up to T3, the longer-term clinical effects of the intervention are not known. Additionally, participants' psychiatric treatment data were not collected past T1, and their use could have contributed to the relative lack of differences between control and experimental groups.

Given the impact of PPD on birthing parents and their families, continued efforts aimed at developing and testing efficient, evidence-based preventive interventions for those at-risk for PPD are warranted. A full-scale RCT with a higher risk sample may justify the brevity and potential benefits of 1-day CBT-based workshops. If successful, this intervention could help prevent PPD in large numbers of individuals with potential benefits for families and society.

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Author Affiliations: Department of Psychiatry and Behavioural Neurosciences, McMaster University, Hamilton, Ontario, Canada (Boland, Lloyd, Bieling, Streiner, Van Lieshout); Department of Psychology, Neuroscience & Behaviour, McMaster University, Hamilton, Ontario, Canada (Drage); Faculty of Health Sciences, Queen's University, Kingston, Ontario, Canada (Serrano-Lomelin).

Corresponding Author: Zoe Boland, Department of Psychiatry and Behavioural Neurosciences, McMaster University, Hamilton, 1280 Main St W, Hamilton, ON L8S 4L8, Canada (bolandz@mcmaster.ca).

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