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Original Research

A Multiple-Baseline Study of the Effects Associated With Metacognitive Therapy in Postpartum Depression

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Introduction: Postpartum depression is a disabling psychological disorder that, if left untreated, may have negative consequences for the mother, her partner, and the child. Although women with postpartum depression often experience symptoms of anxiety as well as depression, this has been underresearched. As metacognitive therapy assumes that the underlying mechanisms for both anxiety and depression are the same, it is a potentially useful psychological treatment for postpartum depression.

Methods: A pilot study was carried out using a multiple-baseline single case series to examine the effects associated with metacognitive therapy in the treatment of depression. Six women with postpartum depression were assigned to no-treatment baselines of 3 to 6 weeks, followed by 8 to 12 sessions of metacognitive therapy. Follow-up with participants took place at 3 and 6 months posttreatment.

Results: All participants experienced clinically significant reductions in symptoms of depression and anxiety, with corresponding reductions in metacognitive beliefs consistent with the idea that this may be the mechanism by which change occurred. Furthermore, all scores fell within the normal range posttreatment, and effect sizes were large. Treatment gains were maintained at 3 and 6 months posttreatment by all participants.

Discussion: This pilot study suggests that metacognitive therapy may be an effective psychological treatment for postpartum depression.
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Keywords: bonding, mothers, postpartum depression, single case design

INTRODUCTION

Postpartum depression (PPD) is a nonpsychotic, depressive illness that can last from several weeks to a year after childbirth.[1] Women with PPD may experience more irritability, difficulty sleeping, and tiredness than other people who experience depression, but there is little evidence to suggest a symptom profile for PPD that differs with depression experienced at other times in a woman's life.[1,2] However, it deserves separate consideration because it may cause considerable distress at a critical time in a woman's life and may negatively affect her bond with her infant and her child's psychological development.[3–5] PPD is often associated with symptoms of anxiety, that is, worry about the ability to cope and not being a good enough mother.[6–8]

Although antidepressant medication is the most common treatment for PPD and is effective in reducing symptoms,[9,10] many women refuse to comply with this, because they are concerned about potential side effects for themselves and their infants if they are breastfeeding.[9,11]

Evidence from randomized controlled trials of psychological therapies in the treatment of PPD has shown that cognitive-behavioral (CBT) and person-centered interventions were equally effective in reducing symptoms of PPD 6 months postpartum and were superior to care as usual.[12] Milgrom et al[8] found that group CBT, group counseling, and individual counseling were significantly more effective than routine care in reducing symptoms of PPD. Interpersonal therapy is also recommended by the National Institute for Health and Clinical Excellence[13] for the psychological treatment of PPD, because studies have highlighted its superiority compared with care as usual in reducing symptoms of PPD.[14–16] Although the results of these studies suggest significant reductions in symptoms of depression, some participants remained mildly depressed posttreatment.[8,15] Furthermore, several studies reported high attrition rates and few reported follow-up data, making it difficult to ascertain the stability of treatment effects.

Although many women experiencing PPD describe both depressive and anxious symptoms, anxious worrying is not typically addressed in clinical trials.[6,8] Processes such as worrying may account for the residual symptoms seen in other outcome studies and for patient attrition, as the treatments for depression may not address the woman's anxiety. There is likely to be added value in treatment that addresses anxious and depressive thinking processes at the same time. A treatment specifically designed to do this is metacognitive therapy (MCT).[17,18] Wells[17] suggested that psychological disorders arise from cognitive attention syndrome (CAS), which is a persistent negative thinking style and includes rumination and worry. This syndrome arises from underlying metacognitive beliefs, and the process gives rise to extended low mood and anxiety. Key aspects of CAS in depression and anxiety are the processes of rumination and worrying. Negative thoughts are assumed to activate positive beliefs about rumination/worrying (eg, that it is helpful), which leads to sustained thinking about depression- or anxiety-related experiences. However, once the rumination process has started, this is perceived as uncontrollable and dangerous (ie, negative beliefs), resulting in negative social consequences, low mood, and anxiety. Treatment of depression and anxiety,

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Quick Points

- This is the first published study examining treatment of postpartum depression with metacognitive therapy, which uses attention training techniques and challenges metacognitive beliefs.
- All 6 of the participants achieved clinically and statistically significant improvements on the Edinburgh Postnatal Depression Scale and the Hospital Anxiety and Depression Scale.
- Participants also reported posttreatment improvements in their relationship and bond with their infants.
- Five of the participants were classified as "recovered" posttreatment, and the sixth was classified as "improved."
- Metacognitive therapy may be an efficacious, cost-effective treatment for postpartum depression. Additional research is needed to confirm the findings from this pilot study.

using this model, focuses on increasing metacognitive control over CAS using attention training techniques through worry/rumination postponement strategies and challenging metacognitive beliefs.[17,19]

Preliminary studies suggest that MCT is associated with reductions in symptoms of worry and anxiety[20,21] and reduces depression and rumination.[22,23] To date, no studies have examined the effects associated with MCT in PPD. To examine the effects of MCT in mothers with PPD, a pilot study was conducted between November 2009 and January 2011 using a multiple-baseline single case design. It was hypothesized that MCT would be associated with significant improvements in all depression measures, maternal bonding, and metacognitive beliefs posttreatment and that treatment gains would be maintained at the 3- and 6-month follow-up assessments.

METHODS

Design

The study employed a nonconcurrent multiple-baseline A-B design across participants, in which A is the baseline phase and B is the intervention phase.[24] Different lengths of baseline were used to ensure that scores on the outcome measures were stable and that any improvements in scores on outcome measures could be attributed to the intervention rather than to time, expectancy of receiving treatment, regression to the mean, or multiple testing. Only those effects that can be clearly observed are interpreted as providing some protection against type I error, but we supplemented visual analysis with formal clinical significance testing of the outcome measures. At entry to the study, participants were assigned to a no-intervention baseline that ranged from 3 to 6 weeks.

Measures

The following 8 survey instruments were used in this study: 1) Edinburgh Postnatal Depression Scale, 2) Structured Clinical Interview, 3) Beck Depression Inventory—second edition, 4) Hospital Anxiety and Depression Scale, 5) Postpartum Bonding Questionnaire, 6) Metacognitions Questionnaire—30, 7) Positive Beliefs about Rumination Scale, and 8) Negative Beliefs about Rumination Scale.

The Edinburgh Postnatal Depression Scale (EPDS) is a 10-item self-report measure designed to identify women at risk of developing PPD[25] and is the most widely used screening measure in community samples.[26] Scores on the EPDS range from 0 to 30, where scores of 10 to 12 indicate possible PPD and scores greater than 13 suggest probable PPD. A score of 10 on the EPDS was used as a cutoff for inclusion into the current study, as this is the score most commonly used in similar studies and is indicative of possible PPD. Participants completed this measure weekly during baseline and the intervention and at follow-up.

The Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV), Axis 1 Disorders (SCID-I), was used to verify the presence of major depression in participants and to ensure that this was the primary diagnosis.[27]

The Beck Depression Inventory (BDI-II) is a 21-item self-report measure that assesses the presence and severity of depressive symptoms, attitudes of depression, and somatic-affective and cognitive symptoms occurring in the previous 2 weeks.[28] Although some items of the BDI-II may apply to all new mothers (eg, changes in sleep), it is still the best assessment of depression severity and has good specificity, sensitivity, and positive predictive value for moderate to severe depression with women in the postpartum period.[29] Total scores range from 0 to 63. A score from 0 to 13 suggests an absence of or minimal depression, 14 to 19 indicates mild depression, 20 to 28 signifies moderate depression, and a score greater than 29 suggests severe depression. The BDI-II has been used as an outcome measure in similar studies.[8,14,30,31] Participants completed the BDI-II pre- and posttreatment and at follow-up assessments.

The 14-item self-report Hospital Anxiety and Depression Scale[32] (HADS), designed to assess the severity of both depression and anxiety, has been widely used in both community and clinical samples.[33,34] The HADS has been proposed as an appropriate tool to assess postpartum anxiety as well as depression, which has been lacking in previous research.[35] Scores range from 0 to 21 for both subscales. A score of 0 to 7 indicates a lack of depressive/anxious symptoms. A score between 8 and 10 suggests a "borderline" case, 11 to 15 suggests moderate symptoms, and a score greater than 16 indicates the presence of severe symptoms. This measure was completed weekly.

The 25-item Postpartum Bonding Questionnire[36] (PBQ) is a widely used measure of a mother's feelings or attitudes toward her infant.[37,38] Although it has 4 subscales (ie, impaired bonding, rejection and anger, anxiety about care, and risk of

abuse), because of concerns over its factor structure,[37,38] only total scores were analyzed. These range from 0 to 125, with higher scores indicating a potentially impaired relationship between mother and infant. This measure was completed pre- and posttreatment and at follow-up assessments.

The short-form Metacognitions Questionnaire[39] (MCQ-30) was used to measure metacognitive beliefs, judgments, and thought-monitoring tendencies, which are assumed to maintain psychological disorders. Participants must rate their beliefs about particular thoughts on a 4-point scale ranging from "do not agree" to "agree very much." Total scores range from 30 to 120; higher scores indicate a potentially unhelpful thinking style. The MCQ-30 has good internal consistency (Cronbach's alpha ranging from 0.72 to 0.93) and good test-retest reliability ($r = 0.75$ total score; $r = 0.79$ positive beliefs; $r = 0.59$ uncontrollability/danger; $r = 0.69$ confidence; $r = 0.74$ need for control; $r = 0.87$ cognitive self-consciousness).[39]

The 9-item Positive Beliefs about Rumination Scale[40] (PBRS) and the 13-item Negative Beliefs about Rumination Scale[41] (NBRS) assess positive and negative metacognitive beliefs about rumination, respectively. On a 4-point scale, participants rate how much they agree with a list of statements; a high score on both scales indicates a greater belief in rumination as a useful coping strategy. The PBRS has high internal consistency (Cronbach's alpha = 0.89) and good test-retest reliability ($r = 0.85$) and reasonable convergent and discriminant validity, including significant correlations with measures of rumination and depression.[40] Total scores on the PBRS range from 9 to 36, with higher scores suggesting a stronger belief rating. The NBRS has good internal consistency, test-retest reliability, and convergent and concurrent validity.[41] Cronbach's alphas are 0.80 and 0.83 for NBRS1 and NBRS2, respectively. Total scores on the NBRS range from 13 to 52, with higher scores suggesting a stronger belief rating. These measures were completed pre- and posttreatment and at follow-up assessments.

Procedure

After gaining full ethical approval from the Stockport National Health Service and the University of Manchester's research ethics committees, participants were recruited via a primary care mental health team, general practitioners (GPs), and health visitors in greater Manchester, United Kingdom. Participants who were referred to the study had already been given a diagnosis of PPD by the referrer. Based on a risk protocol, if during the assessment or baseline period, there were any concerns regarding risk or significant lowering of mood, the researcher used a behavioral activation strategy in order to improve mood. If this was not successful or if there were significant concerns regarding risk, then the participant would be removed from the study, and routine procedures regarding risk would be employed.

To ensure that informed consent was given, participants were given a Participant Information Sheet, which outlined the nature of the study, and were asked to take a week to think about it and discuss with family and/or friends before signing a consent form. All treatment sessions were conducted in the participant's own home by a third-year trainee clinical psychologist who was trained and supervised by the developer of the MCT treatment.[18] This treatment was conducted following a manualized protocol[18] and consisted of 8 to 12 weekly sessions that lasted for one hour. Because of similarities between symptoms of PPD and depression and similarities between the cognitive processes of worry and rumination, the treatment protocol was based on the MCT model for depression. The protocol is outlined in Table 1.

Home visits were used to facilitate attendance at sessions (ie, no need to arrange child care) and because it is envisaged that this treatment may be delivered in the future by a range of health care professionals who support women with PPD (such as health visitors).

The first session involved eliciting a formulation and socializing the participant to the model and aimed to show participants how their existing coping strategies (ie, ruminating/worrying) maintained their symptoms of PPD. Participants were taught attention training (ATT) to increase awareness of their attentional focus and reduce the amount of attention given to internal thoughts and symptoms. Attention training is based on principles of cognitive psychology, with participants practicing attention focusing, switching, and divided attention. They can apply this technique to shift the focus of attention away from negative thoughts (ie, worrying/ruminating).

The first goal of treatment was to challenge negative beliefs about the uncontrollability of rumination. Participants were taught detached mindfulness[42] and worry/rumination postponement to reduce levels of rumination and worry. Detached mindfulness is a technique that allows a person to become detached from her or his thoughts and to observe them rather than engaging with them (by analyzing or suppressing them). When participants noticed a worrying thought, they were asked to acknowledge their worry, apply detached mindfulness to it, and postpone their worry until a specified time. Participants were allowed to worry as much as they wanted to within this period of 15 minutes if they needed to.

Maladaptive coping strategies, such as avoidance of activities, were addressed. Experiments were set up between sessions so that participants could challenge their metacognitive beliefs; for example, participants were asked to engage in activities to test the belief that they were unable to concentrate or perform effectively. When negative beliefs had decreased to zero levels of conviction, positive beliefs about rumination and worry were addressed through guided discovery and Socratic questioning.

Negative beliefs about depression and anxiety were addressed because participants may monitor themselves for signs that they are developing symptoms of PPD again. Participants were encouraged to compare their new way of managing worries with their old way. They were also invited to identify potential future triggers and consider how they would manage these using their new plan.

Participants who received more than 8 sessions of MCT were slower to challenge negative beliefs about rumination (eg, "I have no control") and generalize techniques. Extra sessions focused on conducting experiments in session and verbal reattribution aimed at challenging these beliefs.

Table 1. Typical Metacognitive Therapy Treatment Protocol

Session	Aim	Techniques	Homework
1	Normalize symptoms, socialize to MCT model, and elicit formulation.	Teach attention training technique (ATT).	Listen to ATT recording.
2	Challenge negative beliefs about rumination starting with beliefs about uncontrollability of rumination.	Introduce detached mindfulness and rumination postponement. Conduct experiments in session.	Listen to ATT recording and apply detached mindfulness and rumination postponement.
3	Challenge negative beliefs about rumination, explore activity levels and avoidant coping.	Conduct experiments in session.	Listen to ATT recording, apply detached mindfulness and worry postponement, increase activity levels.
4	Check uncontrollability belief and challenge positive beliefs about rumination.	Socratic dialogue and guided discovery.	As above and conduct agreed-on experiments.
5	Continue challenging positive beliefs about rumination and explore unhelpful coping strategies.	Guided discovery and Socratic questioning. Identify advantages and disadvantages of rumination. Threat monitoring intervention.	As above, conduct experiments in which threat monitoring is banned and then increased.
6	Explore negative beliefs about depression and/or anxiety.	Guided discovery and Socratic questioning.	As above.
7	Generalize techniques. Start developing a relapse prevention strategy.	Old plan versus new plan. How did the participant respond to intrusive thoughts in the past, and how do they respond now?	As above.
8	Complete relapse prevention plan and identify potential future triggers.	As above.	As above.

Abbreviations: MCT, metacognitive therapy.

Inclusion and Exclusion Criteria

Participants were at least 18 years of age and scored 10 or more on the Edinburgh Postnatal Depression Scale. Postpartum depression was required to be the participant's primary difficulty, and they were stable on pharmacologic treatment for one month (if applicable).

Participants were excluded from the study if they were actively psychotic or used alcohol or other substances. Because of limited resources, recruitment of participants was restricted to those who did not require the use of an interpreter.

Data Analysis

As a case-series design was employed, it was decided that the most appropriate way of investigating data was using visual inspection of time-series graphs. Decreasing or increasing trends during baseline may be difficult to interpret, but stable baseline followed by increasing or decreasing trends after intervention suggests an intervention effect.[43] To support this analysis, paired-sample *t* tests were conducted in order to compare pre- and posttreatment scores and pretreatment and 6-month follow-up scores on all clinical outcome measures. In addition, clinically significant change was calculated using the formula described by Jacobson et al[44] and Cohen's d as an index of effect size.

Clinical and Reliable Change Calculations

Mean baseline EPDS scores were above the cutoff for PPD, with 3 participants presenting with severe depression, as measured by the BDI-II. The cutoff point for the EPDS was calculated using Jacobson et al's formula.[44] This calculation indicated that participants must score below 9 on the EPDS posttreatment to ensure that they have moved from a clinical population to a "normal" population. This figure was lower than the cutoff score of 10 for possible PPD.[25]

Similar calculations were conducted for the anxiety and depression subscales of the HADS. The anxiety subscale required participants to report scores of less than 11 posttreatment, which was the same as the cutoff point suggested by the authors.[32] The depression subscale required participants to score less than 8 posttreatment to be considered to have made a clinically significant change. This score was lower than the recommended published cutoff score of 11 for this subscale.

In terms of the reliable change index (RCI), a 4-point change on the EPDS was required to ensure that reliable change had occurred. The BDI-II required a change of 11 points to ensure that a statistically significant change had occurred. An RCI for the HADS indicated that a change of 4 points was needed on both scales to ensure that a reliable change had occurred. Therefore, to demonstrate both reliable and significant clinical change in scores posttreatment, scores had to decrease by the number of points as suggested by the

RCI calculations and had to be below c (ie, EPDS <9, HADS-Anxiety <11, HADS-Depression <8).

RESULTS

Participants

Ten mothers were eligible to participate in the study; 2 women declined and 2 women's symptoms resolved during the baseline period. Six mothers participated in this study, and their infants were aged between 5 and 7 months. The participants ranged in age from 21 to 41 years, with a mean age of 34 years. All participants lived with their partners and child(ren), and 4 were married. This was the first child for 3 participants and the second for 2 participants, and one participant had given birth to her third child. Five participants described themselves as white British, and the sixth participant described her ethnicity as Asian. All but one of the women had experienced low mood since the birth of their infant, for at least 5 months. The exception was participant F, who reported greater feelings of anxiety rather than low mood.

Treatment Outcome

Figure 1 illustrates that 4 participants (A, C, E, F) had either stable or increasing scores during baseline. The stability of these baselines suggests that any effects occurring during treatment are unlikely to be a result of spontaneous recovery from PPD, self-monitoring, therapist contact, or natural variation in scores. Participant B's scores decreased during baseline, but this coincided with a time when her partner was on leave from work and she received much more support than usual. Her scores increased once this period passed. Participant D presented as severely depressed and expressed suicidal ideation during the assessment; therefore, a brief behavioral activation intervention was conducted to address the issue of risk, and this resulted in a decrease in baseline scores before MCT was introduced.

All participants achieved clinically and statistically significant improvements on the EPDS and the HADS, and the effect sizes were large (Table 2). The effect sizes and the rates of change for HADS anxiety and depression suggest that the treatment was associated with similar effects on both symptom clusters. Five of the 6 participants experienced clinically significant reductions in the BDI-II, and the effect size was large (Cohen's d = 3.12).

Treatment was associated with good outcomes, with 83% of participants classified as "recovered" posttreatment. One participant (E) was classified as "improved," but it is important to note that all her baseline scores were far lower than those reported by the other participants.

Participants also reported improvements in their relationship and bond with their infants posttreatment as demonstrated by a significant reduction in scores on the PBQ. Scores on measures of metacognition (PBRS, NBRS, MCQ-30) also decreased posttreatment (Table 1).

Treatment gains made were maintained by participants, with scores on all measures remaining well within the normal range 3 months posttreatment. Four participants completed 6-month follow-up assessments: 3 participants remained within the normal symptom range, and participant F's BDI-II score was just at the cutoff for mild depression. Following an intention-to-treat analysis, all participants continued to demonstrate clinically and statistically significant improvements at 6 months on the EPDS and both HADS subscales, with effect sizes remaining large (Table 2). Five of the 6 participants also achieved clinically significant improvements at

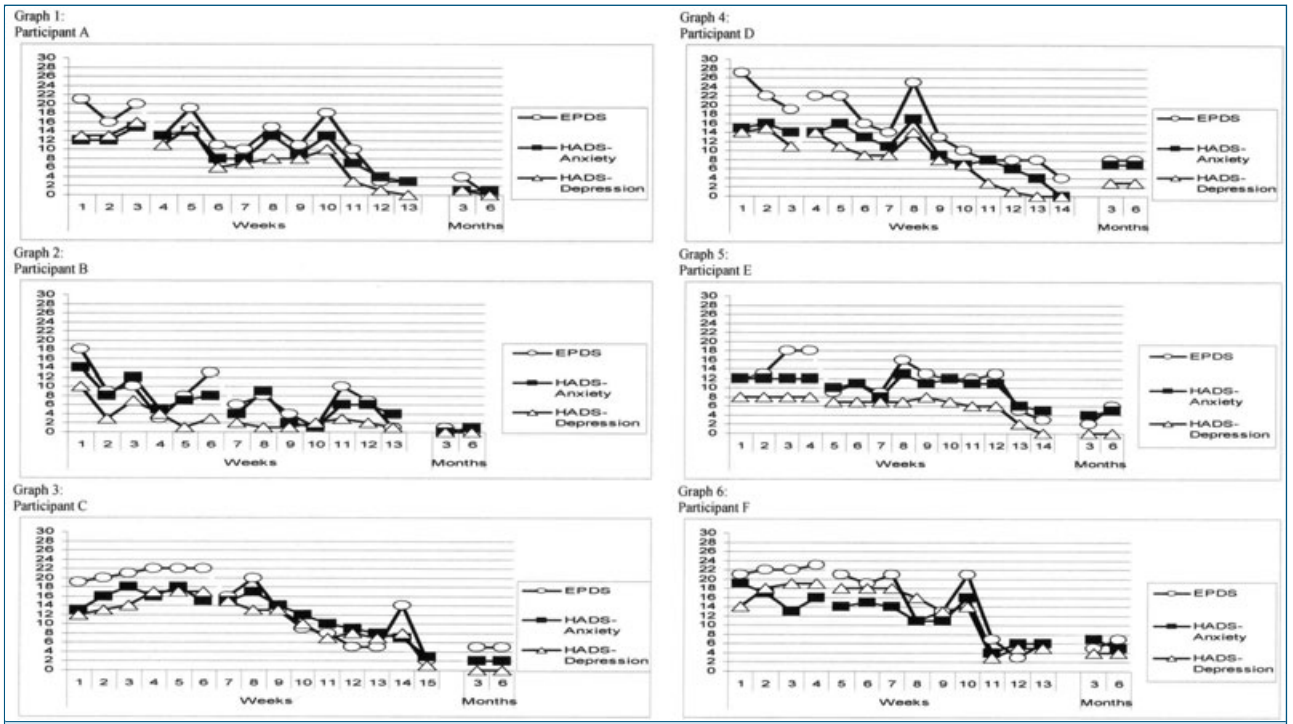

Figure 1. Participant Scores at Baseline and at 3 and 6 Months

Table 2. Paired *t* Test of Pre- and Posttreatment Scores[a]

	Pretreatment Mean (SD)	Posttreatment Mean (SD)	Mean change	*t* Calc	*P* value
EPDS	18.83 (4.17)	3.17 (1.6)	−15.66	$t(5) = 12$	$P < .000$
HADS-Anxiety	13.50 (2.74)	3.33 (2.07)	−10.17	$t(5) = 7.26$	$P = .001$
HADS-Depression	12.33 (4.84)	1.33 (1.97)	−11	$t(5) = 6.57$	$P = .001$
BDI-II	32.50 (12)	4.67 (4)	−27.83	$t(5) = 6.1$	$P = .002$
PBQ	27.50 (19.13)	4.50 (2.59)	−23	$t(5) = 3.19$	$P = .024$

Abbreviations: BDI-II, Beck Depression Inventory-second edition; EPDS, Edinburgh Postnatal Depression Scale; HADS-anxiety, Hospital Anxiety and Depression Scale; HADS-Depression, Hospital Anxiety and Depression Scale; PBQ, Postpartum Bonding Questionnaire.
[a]EPDS scores range, 0-30; HADS Anxiety range, 0-21; HADS-Depression range, 0-21; BDI-II range, 0-63; PBQ range, 0-125.

6 months on BDI-II scores, again with a large effect size. Scores on the metacognition scales remained stable during the posttreatment assessment phase. These results are indicative of the stability of improvements.

DISCUSSION

This pilot study has produced preliminary evidence that MCT is associated with large and clinically meaningful improvements in PPD. Treatment was well received with no dropout. Five participants were classified as "recovered" posttreatment. Participants also demonstrated significant reductions in all metacognitive beliefs, consistent with the idea that this may be the mechanism by which the positive change occurred. All gains remained stable at the 3- and 6-month follow-up assessments.

The reduction in scores on both subscales of the HADS indicates that MCT may be effective in reducing symptoms of both anxiety and depression. These findings support the theory that the underlying cognitive processes are similar and may be targeted with a single approach.[43]

All women reported significant reductions in symptom scores posttreatment regardless of previous experience of anxiety and depression. These reductions occurred even though 2 participants experienced considerable social difficulties during the course of the study. Three participants returned to work by the end of the study. Participants also experienced improvement in their attitudes toward their infants, even though this issue was not directly addressed in therapy.

There were reductions in broader measures of metacognitive beliefs, which corresponded with reductions in scores on the treatment outcome measures, suggesting that metacognitive beliefs may be implicated in the maintenance of symptoms of PPD.

In addition, the study also found a relationship between MCT and improvement in the mother-infant relationship. Mothers felt more bonded with their infants posttreatment, as highlighted in the significant reduction in PBQ scores. This is a very important finding, as impaired bonding is associated with long-term negative outcomes for the infant.

Participants liked the structure of MCT, possibly because the birth of their infant presented them with many changes and the ability to predict the course of therapy was helpful. Participants also commented that they were relieved that they did not have to identify issues for therapy, as part of their distress was that they did not understand why they felt so depressed at a time when they should have been overjoyed. The process of eliciting and sharing the MCT formulation was especially helpful, with all participants commenting that this normalized their experiences. It also helped them to clearly understand the process of the therapy and instilled hope for recovery. In addition, the in-session experiments helped to make the therapy more accessible to participants, as complex ideas could be explained and illustrated using simple demonstrations.

Although these findings are encouraging, it is important to acknowledge that this study is preliminary and used a single case design with a small sample size. There may also have been some bias with the sample selection, as all participants sought help for their PPD and so were motivated to engage in therapy. The use of this methodology and the associated lack of a nontreatment control group make it too premature to draw conclusions about the effectiveness of MCT in the treatment of PPD. Randomized controlled trials allow for the control of nonspecific effects of treatment and should be considered in future studies.

CONCLUSION

The results of this pilot study are promising and suggest that further study, using a larger sample size, is warranted. Metacognitive therapy appeared to be associated with significant reductions in symptoms of depression and anxiety simultaneously and in a short time frame. This was an important finding, as women with PPD commonly experience both symptoms, so addressing them at the same time may reduce therapy duration, making MCT a cost-effective intervention. Furthermore, the publication of MCT as a treatment manual could make it more accessible to health care professionals who work with this client group.

AUTHORS

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to disclose.

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