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REVIEW ARTICLE

Long Term Effectiveness of Cognitive Behavior Therapy for Treatment of Postpartum Depression: A Systematic Review and Meta-analysis

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ABSTRACT

BACKGROUND: The existing trials on the long term effectiveness of cognitive behavior therapy (CBT) for the treatment of postpartum depression have conflicting results. Therefore, we performed a systematic review to summarize the current evidence.

METHODOLOGY: Literature search was performed using electronic databases Medline, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and PsychINFO were explored from January 2000 to March 2013.

All peer-reviewed English-published randomized controlled trials were eligible if they assessed the long term (at least at 24 weeks post partum) effectiveness of CBT versus standard postpartum care for prevention of postpartum depression.

Data from eligible studies were abstracted by using structured data extraction form and pooled for calculation of relative risk ratio.

RESULTS: Five randomized controlled trials fulfilled eligibility criteria. In the included studies, the total number of women was 1087 with age ranged from 17 years to 42 years. Assessment carried on the 'Cochrane Risk of Bias Tool' showed the trials included in this review had low risk of bias. Two trials had sample size less than 50. Two out of five trials reported beneficial effect of CBT whereas three trials found no difference. Meta-analysis [random effect model] revealed 30% reduction in the prevalence of depression in the intervention group as compared with the control group [RR: 0.70 (95% C.I: 0.55 to 0.90)]. However, these results showed effectiveness of intervention because of one large trial and excluding this trial, there was no significant difference.

CONCLUSION: In this systematic review, we found a beneficial effect of CBT in the prevention of postpartum depression at 24 weeks of postpartum period. However, the evidence is limited by a small number of trials with results being dominated by a single large trial. Robust research with larger sample size is needed to determine the long-term effectiveness of CBT for treatment of postpartum depression.

Keywords: Postpartum Depression; Prevention; CBT; Systematic Review

INTRODUCTION

Postpartum depression (PPD), also known as postnatal depression, affects women typically within first year following childbirth [1]. It is the most common complication of childbearing as it occurs approximately in one out of every eight deliveries [1]. In different studies, the prevalence of PPD ranged from 7%-20% in UK, US, UK and Australia [2]. PPD negatively affects health seeking behaviors of women not only for themselves but for their infants as well [3]. Studies have reported a low level of social engagement, slow physical growth, and high level of stress reactivity among children born to mothers with untreated PPD [4-6].

Various treatment options, pharmacological and non-pharmacological, are available for treatment of PPD [7]. Non-pharmacological treatment options are preferred in the postpartum period because of adverse effects of pharmacological agents in term of breast feeding [8-10]. Among non-pharmacological options, cognitive behavior therapy (CBT) is one of the effective treatment

options for postpartum depression [11, 12]
Previous systemic reviews have examined the effectiveness of overall non-pharmacological interventions including psychosocial and psychological options (not CBT specifically) for PPD [13-18]. These reviews were also not focused to any specific postpartum time period in term of effectiveness of interventions. In addition, the available trials on CBT have reported conflicting results and most trials have limited sample sizes. The aim of this systematic review was to assess the effectiveness of CBT for postpartum depression at least at 24 weeks of postpartum period as compared to the provided standard postpartum care. This specific time period for long term effectiveness of CBT was chosen as most relapses are reported to occur in this period and raised questions over effectiveness of specific intervention [11, 12].

METHODOLOGY

Search and selection of studies: We searched three electronic databases, Medline, CINAHL and psycINFO, with search terms, cognitive behavior therapy, postpartum depression, postnatal depression, pregnancy, women, and standard postpartum care. These electronic databases contain original articles from subject of medicine, psychology and allied health sciences. The search was done from January 2000 to March 2013 to get most up to date information about chosen area. Search was carried out by using various combinations of key words (including MeSH terms) for interventions (CBT), control (routine care, postpartum care), outcome (postpartum, postnatal) and study design (randomized controlled trials).
Selection of studies for review was done in accordance with developed protocol which was approved by all authors after critical review. Along with electronic databases, reference and hand search of journals was carried out to identify studies that might have been missed from electronic search.
We included all peer-reviewed randomized controlled trials (RCTs) published in English language. We limited our studies to RCTs as they are the gold standards for assessing effectiveness of an intervention. We included only those trials that had enrolled women with normal vaginal delivery and had postnatal depression. Trials in which women had twin pregnancy, or had undergone instrumental or operative delivery were excluded because of higher risk of depression linked with these conditions as compared to normal vaginal delivery. We included trials with individual-based CBT session as well as with group-based CBT sessions. We excluded trials with pharmacological intervention, psychodynamic therapy, non-directive counseling, behavioral therapy, or action therapy. The control in all the trials needed to be standard postpartum care given by either health visitors or community support workers, though there was a not exclusion criterion.
The primary outcome considered for review was PPD at least at 24 weeks of postpartum period. Trials assessing the effectiveness of CBT at less than 24 weeks postpartum were excluded. The secondary outcomes considered for review include anxiety, stress, postpartum marital relationship and cost effectiveness of postpartum intervention.

Data extraction: Two independent reviewers used a structured form for data abstraction and discrepancies were solved through discussion.

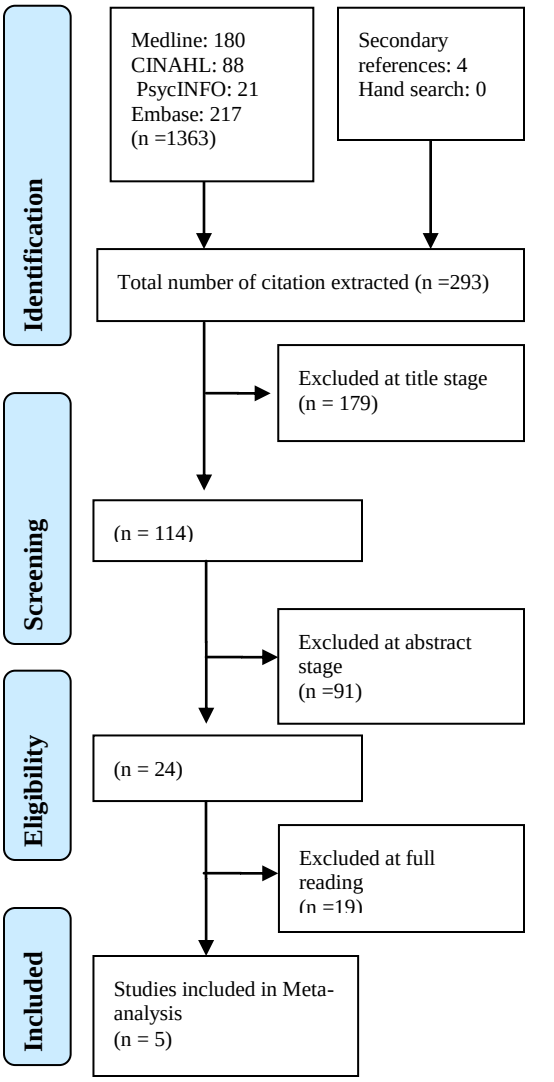
Assessment of methodological quality: Methodological qualities of the included studies were assessed by using "The Cochrane Risk of Bias Tool" as per guidelines [19, 20].

Data Analysis: A qualitative analysis of the results of all included studies was performed to examine the long term effect of CBT on treatment of PPD and to explore the similarities and differences across studies. In meta-analysis quantitative data of the trials were pooled to estimate the effect size of CBT benefit. Software "Review manager" was used to calculate risk ratio (effect measure) along with 95% confidence intervals to assess effectiveness of CBT sessions as compared to standard treatment by using random effects model. We assessed heterogeneity among studies by using I^2 statistics and performing test for heterogeneity. $I^2 > 50\%$ and p-value of $Chi^2 \leq 0.05$ were considered as evidence for heterogeneity. Due to small number of studies, we did not examine publication bias.

RESULTS

We identified 293 studies from the literature search. Figure 1 shows overall study selection stages. Table 1 shows reasons of studies excluded from the review [21-39]. Five of the trials [40-44] fulfilled our eligibility criteria (Table 2). Studies were published between 2001 and 2011. Three trials were conducted in UK

Figure 1: PRISMA Flow Diagram



[41-43], one in USA [40] and one in Australia [44].

In four trials, randomization was at individual level [40, 42-44] whereas in one trial, it was at cluster (geographical areas in which people registered with specific general practitioners) level [41]. Total number of participants in included studies was 1087. Sample size ranged from 37 [44] to 595 [41]. Three trials [40-42] reported participants' age range (17 to 42 years) while two trials reported mean age of participants 27.89 [43] and 32.2 years [44].

Intervention: In the included trials [40-44] effectiveness of CBT was compared with standard postpartum care. However, the duration of CBT sessions varied across trials. In three trials [44, 45] sessions were of one hour duration.

There were differences in total length of intervention across trials. The total length of intervention in four trials was eight weeks [40, 41, 43, 44]. Of these four trials one [40] had three booster sessions at 6, 16 and 52 weeks of postpartum period. In one trial, length of intervention was up to ten weeks [42]. Studies varied in the personnel who delivered CBT and included health visitors [41, 43, 44], therapist [42], and research staff [40]. The comparator group in all included trials [40-44] got standard usual postpartum care which included routine health visits by community nurses, health visitors and community support workers.

In four trials [41-44], PPD was diagnosed if participants scored ≥12 on Edinburgh Postpartum Depression Scale (EPDS) whereas in one trial [40] a score of ≥20 on Beck Depression Inventory (BDI) was used as a diagnostic criterion. The last assessment for outcome was performed at 24 weeks in two trials [43, 44] whereas in the remaining three trials it was done at 52 weeks [40], 72 weeks [41] and 60 months [42].

Secondary outcome including anxiety, postpartum marital relationship and cost-effectiveness of the intervention for postpartum depression were reported by two trials [41, 42].

Quality of studies: Quality of the included studies was assessed by using "Cochrane Risk of Bias" tool. Table 3 below summarized the methodological quality of included trials. Blinding of participants and personnel for intervention was maintained in one trial [40]. Similarly, there was no clear information about blinding of outcome assessment in trials [40, 42-44] except one [41]. Study power calculation was provided in only two trials [41, 42].

Qualitative Data Synthesis: Two trials [41, 43] showed a significant positive effect of CBT sessions on postpartum depression at 24 weeks of postpartum period. In one trial [41], the proportion of participants with postpartum depression at 24 weeks of postpartum period was 32.9% in intervention group and 45.6% in control group. In the second trial [43] the proportion of participants with postpartum depression at 24 weeks of postpartum was 36.4% versus 65.2% in control group.

Three trials [40, 42, 44] found no significant beneficial effect of CBT sessions over routine standard postpartum care provided by health visitors for prevention of postpartum depression at 24 weeks postpartum. In one of the three trials

Table 1: Characteristics of the excluded studies

Studies	Reasons for exclusion
Dennis (21)	Study assessed the effectiveness of telephone based peer support for PPD rather than CBT
Small (22)	Study assessed the effectiveness of debriefing sessions for PPD rather than CBT. Focus of the study was on women who had caesarean section, forceps, or vacuum extraction rather than normal delivery
Reid (23)	Study assessed the effectiveness of self help materials and/or support group sessions for PPD rather than CBT
Priest (24)	Study assessed the effectiveness of debriefing sessions for PPD rather than CBT
Morrell (25)	Study assessed the effectiveness of postnatal care provided by community midwives and community support workers for PPD rather than CBT
Ickovics (26)	Study assessed the effectiveness of group prenatal care led by a trained prenatal care provider for PPD.
Gao (27)	This study assessed role of routine antenatal classes at group level for PPD at 6 weeks postpartum.
Sen (28)	Study focused on PPD with twin pregnancies rather than normal deliveries
Brugha (29)	Study assessed the effectiveness of "preparing for parenthood session" rather than CBT. The effectiveness regarding PPD was assessed at 12 weeks postpartum rather than 24 weeks
Gamble (30)	Study assessed the effectiveness of debriefing sessions rather than CBT and outcome assessment was at 12 weeks instead of 24 weeks
MacArthur (31)	Study assessed the effectiveness of extended midwives home visits rather than CBT and outcome assessment was done at 16 weeks instead of 24 weeks
Tam (32)	Study assessed the effectiveness of educational counseling on PPD at 6 weeks postpartum
Waldenstrom (33)	Study assessed the effectiveness of midwifery care focus on continuity and PPD assessment was done at short term (8 weeks postpartum)
Zlotnick (34)	Study assessed the role of survival skills for mothers in PPD at 12 weeks postpartum
Dennis (35)	It was a pilot study to assess the effectiveness of telephone based peer support session on PPD
Misri (36)	This study assessed the role of paroxetine along with CBT immediately post treatment (12 weeks postpartum)
O'Hara (37)	This study assessed the role of 60 minutes individual sessions of train therapist on PPD at 12 weeks postpartum
Tripathy (38)	This study assessed the role of group level meetings rather than CBT on neonatal mortality and PPD
Phipps (39)	This study assessed the role of interpersonally oriented intervention rather than CBT on PPD

[40], the proportion of participants with postpartum depression at 24 weeks of postpartum period was 25% in intervention group and 31.3% in control group and this trial revealed no beneficial effect of CBT sessions on anxiety and postpartum marital relationship. It is important to note that this trial was conducted among high risk women and 58% to 72% of women in control group sought additional available services. Similarly, half of the women in intervention group could attend fewer than four sessions. This would have mitigated the effect of intervention. In the remaining two trials [42, 44] there was no effect of CBT session but trials had small sample sizes resulting in limited power.

Meta-analysis: Effectiveness of CBT sessions was shown by statistically significant differences between the intervention and control groups in term of proportion of participants with postpartum depression at 24 weeks postpartum. Quantitative data was pooled from all included trials [40-44]. Meta-analysis revealed a statistically significant beneficial effect of CBT sessions as compared to standard postpartum care on long term management of postpartum depression. [RR: 0.70 (95% C.I: 0.55 to 0.90)]. Findings suggested 30% reduction in prevalence of depression among women at least 24 weeks of postpartum period in intervention group as compared to control. There was no statistically significant heterogeneity across studies.

DISCUSSION

We found that RCTs have conflicting results on the beneficial effect of CBT for the prevention of PPD. Pooling the results using meta-analysis found a statistically significant 30% reduction in the risk of relapse of PPD with CBT over a 24 weeks or longer follow-up. Although four of the five studies did not find a statistically significant benefit, the direction of overall effect size was in favor of CBT. Being small, these studies were not powered to discover a beneficial effect of CBT. Lack of statistical heterogeneity is another indication that study results were generally pointing out the beneficial effect of CBT.

There are certain limitations of this review, which need to be considered while interpreting findings. One trial [41] with large sample size had large weight (65.6%) and may have skewed

Table 2: Characteristics of included studies

Study	Methods	Participants	Interventions	Outcome
Le [40]	*Design:* RCT *Randomization:* Participants picked sealed envelope with assigned random number by PI *Data collection:* Interviews *Power analysis:* not done *Attrition rate:* 20.18% at 16 weeks whereas 30.87% at 52 weeks	Total: 217 Intervention group: 112 Control group: 105	Interventions: two hours CBT group sessions by research staff for eight weeks during pregnancy and three booster sessions at 6, 16 and 52 weeks of delivery. Control: standard postpartum care [Not explicitly mentioned]	BDI ≥ 20 measured post intervention and at 6, 16 and 52 weeks postpartum
Morrell [41]	*Design:* Cluster randomized controlled trial *Randomization:* stratification done on number of births per year, per cluster and then random numbers generated with computer *Data collection*: Mailed questionnaires *Power analysis:* done *Attrition rate:* 29.75% at 24 weeks	Total: 595 CBT: 140 PCA: 131 Control group: 235	Interventions: One hour session every week for up to eight weeks by health visitors for both groups (i) Non directive counseling through person-centered approach (PCA) (ii) CBT sessions Control: standard postpartum care [usual health care visits and care provided by health visitors]	EPDS ≥ 12 at 24, 52, and 72 weeks postpartum
Cooper [42]	*Design:* RCT *Randomization:* random selection of one of four colored balls from a bag *Data collection*: Interviews *Power analysis:* done *Attrition rate:* at 24 weeks was 7.78%	Total: 193 CBT: 43 Psychodynamic therapy: 50 Non directive counselling:48 Control group: 52	Intervention: One hour session on weekly basis for ten weeks from 8 weeks to 18 weeks post-partum by therapist for all three groups (i) CBT sessions (ii) Psychodynamic therapy (iii) Non directive counseling Control: Routine primary care, involving the normal care provided by the primary health care team (i.e. general practitioners and health visitors)]	EPDS ≥ 12 at 4.5 months, 9, 18 and 60 months post-partum.
Honey [43]	*Design:* RCT *Randomization*: Block randomization *Data collection*: Interviews *Power analysis* not done *Attrition rate:* 13% at 24 weeks	Total: 45 Intervention group: 22 Control group: 23	Interventions: Two hour CBT based group sessions for eight weeks, by two female Health Visitors Control: standard postpartum care [Not explicitly mentioned]	EPDS ≥ 12 at 8 weeks and 24 weeks postpartum
Prenderg ast [44]	*Design*: RCT *Randomization*: Randomization table *Data collection*: Interviews *Power analysis:* not done *Attrition rate:* 0% at 24 weeks	Total: 37 Intervention group: 17 Control group: 20	Intervention: one hour CBT sessions at home for six weeks by trained early childhood nurses. Control: standard postpartum care [Not explicitly mentioned]	EPDS ≥ 12 immediately after treatment and at 24 weeks

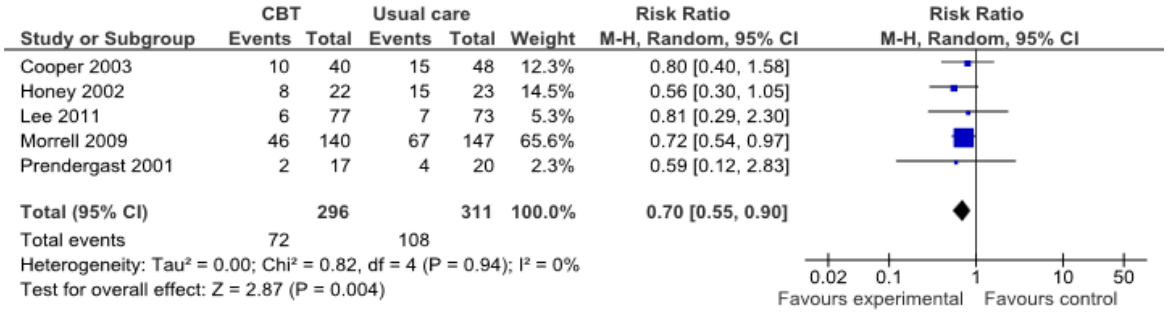
the results in one direction. Inclusion of studies published in English language only might have induced the reporting bias. Similarly, exploration of grey literature and contact with experts in field for unpublished data would have broadened the context of review. Further high qualities RCTs especially with large sample size are warranted to assess the effectiveness of CBT in PPD. It may also be worthwhile to examine the effectiveness of CBT delivered by peers versus health visitors or support workers for postpartum depression. Similarly, importance of marital partner should be considered while designing intervention trials for postpartum depression as lack of social support and marital conflict contribute to the development of PPD.

Table 3: Assessment of risk of bias

	Lee	Morrell	Honey	Prendergast	Cooper
Random sequence generation (selection bias)	+	+	+	+	+
Allocation concealment (selection bias)	+	+	+	+	+
Blinding of participants and personnel (performance bias)	+	-	?	?	?
Blinding of outcome assessment (detection bias)	?	+	?	?	?
Incomplete outcome data (Attrition rate)	+	+	+	+	+
Selective reporting (reporting bias)	+	+	+	+	+

Low risk of bias(+); High risk of bias(-); unclear (?)

Figure 2: Long term effectiveness of CBT for prevention of postpartum depression: Random Effect Model



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