Treatment of Postpartum Depression, Part 2: A Critical Review of Nonbiological Interventions

Cindy-Lee E. Dennis, Ph.D.

Received March 25, 2004; accepted May 6, 2004. From the University of Toronto, Toronto, Ontario, Canada.

Dr. Dennis reports no financial or other support of this work.

Corresponding author and reprints: Cindy-Lee E. Dennis, Ph.D., University of Toronto, Faculty of Nursing, 50 St. George Street, Toronto, Ontario, Canada M5S 3H4 (e-mail: cindylee.dennis@utoronto.ca).

Background: While postpartum depression is a common mental condition with significant burden, it often remains undiagnosed and untreated. The objective of this article is to critically review the literature to determine the current state of scientific knowledge related to the treatment of postpartum depression from a nonbiological perspective.

Data Sources: Databases searched for this review included MEDLINE, PubMed, CINAHL, PsycINFO, EMBASE, ProQuest, the Cochrane Library, and the WHO Reproductive Health Library from 1966 to 2003. The search terms used were *postpartum/postnatal depression* and *randomized controlled/clinical trials*. Published peer-reviewed articles in English from 1990 to 2003 were included in the review, although select earlier studies were also included based on good methodological quality and/or the absence of more recent work.

Method: The criteria used to evaluate the interventions were based on the standardized methodology developed by the U.S. Preventive Services Task Force and the Canadian Task Force on Preventive Health Care.

Results: Twenty-one studies that met inclusion criteria were examined. These studies included interpersonal psychotherapy, cognitive-behavioral therapy, peer and partner support, nondirective counseling, relaxation/massage therapy, infant sleep interventions, infant-mother relationship therapy, and maternal exercise. Although some of these interventions have been better studied for depression unrelated to childbirth, methodological limitations render their efficacy equivocal for postpartum depression.

Conclusions: Definite conclusions cannot be reached about the relative effectiveness of most of the nonbiological treatment approaches due to the lack of well-designed investigations. Randomized controlled trials are needed to compare different treatment modalities, examine the effectiveness of individual treatment components, and determine which treatments are most useful for women with different risk factors or clinical presentations of postpartum depression.

(J Clin Psychiatry 2004;65:1252–1265)

Postpartum depression is a common mental condition affecting approximately 13% of women from diverse cultures.[1] The burden of depression for women is substantial. Research suggests that depression affects women more often than all other chronic diseases with the exception of heart disease. Internationally, depression is responsible for 5.5% of all disease burdens in women.[2] In 2000, depression was the leading cause of nonobstetric hospitalization among U.S. childbearing-aged women, resulting in 205,000 women being discharged with a diagnosis of depression.[3]

This burden extends to the family as well. While women who have suffered from postpartum depression are twice as likely to experience future episodes of depression over a 5-year period,[4] infants and children are particularly vulnerable. Postpartum depression can cause impaired maternal-infant interactions[5] and negative perceptions of infant behavior,[6] which have been linked to attachment insecurity,[7,8] emotional developmental delay,[7,9] and social/interaction difficulties.[10,11] Infants as young as age 3 months have been shown to ably detect their mothers' mood and to modify their own responses accordingly.[12] While cognitive skills,[13] expressive language development,[14] and attention[15] have been negatively influenced by postpartum depression, it has also been reported that children of depressed mothers are 2 to 5 times more likely to develop long-term behavioral problems.[16,17] Child neglect/abuse[18] and marital stress resulting in separation or divorce[19,20] are other reported outcomes. Finally, maternal and infant mortality are rare but real outcomes of postpartum depression.

Despite the well-documented public health consequences of this affective condition, it often remains undiagnosed and untreated. The objective of this review is to critically appraise the literature to determine the current state of scientific knowledge related to the treatment of postpartum depression using psychological, psychosocial, and other nonbiological approaches. Biological approaches were a topic in a previous article in this issue.

METHOD

Search Strategy

Databases searched for this review included MEDLINE, PubMed, CINAHL, PsycINFO, EMBASE, ProQuest, the Cochrane Library, and the WHO Reproductive Health Library from 1966 to 2003. As part of the quality assessment process and to measure the capture rate of relevant references, tables of contents for key journals were hand-searched for the previous 2 years (2001–2003), reference lists of included studies and relevant reviews were examined, graduate theses abstracts were scanned, and key postpartum depression researchers were contacted via e-mail. Finally, all abstracts related to the combination of the keywords *postpartum/postnatal depression* and *randomized controlled/clinical trials* were reviewed to ensure that all potentially significant interventions were obtained. In total, approximately 100 abstracts were examined for inclusion suitability.

Inclusion/Exclusion Criteria

The literature review involved systematically searching for published peer-reviewed articles available in English from 1990 to 2003, although select earlier studies were included based on good methodological quality and/or the absence of more recent work. Research studies that focused on postpartum depression were reviewed; other childbirth-related mental health disorders (i.e., pregnancy or postpartum anxiety, maternity blues, puerperal psychosis) were not appraised. For the purpose of this review, a generous time interval of 1 year postpartum was allowed to account for differing methodologies in the literature.

Data Abstraction

In the initial stage of the search process, peer-reviewed publications were identified and potentially relevant abstracts that met the predetermined eligibility criteria were subsequently extracted for further examination. Research articles were then selected and assessed in a more rigorous manner to determine inclusion suitability. These articles were either included or excluded and further subgrouped. The critical review process consisted of assessing the disorder definition (i.e., diagnostic/screening criteria used), population sampled (i.e., inclusion/exclusion criteria, recruitment process, sample size, participant characteristics), research design (i.e., control for potential bias, method and timing of assessment, statistical analysis, outcome measures, length of follow-up), level and quality of evidence, and critical analysis of variations between findings of pertinent studies.

Methodology For Synthesis

Interventions included in this review were evaluated according to the published criteria used by the U.S. Preventive Services Task Force (http://www.ahrq.gov/clinic/uspstfix.htm) and the Canadian Task Force on Preventive Health Care.[21] Specifically, each treatment approach was evaluated and given a quality-of-evidence grade using the following scheme: I = evidence obtained from at least 1 well-designed randomized controlled trial in a representative population that directly assessed the effects on health outcomes; II-1 = evidence obtained from well-designed trials without randomization or randomized controlled trials with minor methodological limitations; II-2 = evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than 1 center or research group; II-3 = evidence obtained from comparisons between times or places with or without the intervention, pilot trials, or randomized controlled trials, but the strength of the evidence is limited by the number, quality, or consistency of the individual studies; generalizability to routine practice; or indirect nature of the evidence on health outcomes; and III = evidence obtained from opinions of respected authorities on the basis of clinical experience, descriptive studies, or reports of expert committees.

After the quality-of-evidence assessment was complete, each approach was further classified to determine clinical practice recommendations based on the following grading scheme: A = there is good evidence to support the recommendation of this approach; B = there is fair evidence to support the recommendation of this approach; C = there is poor evidence regarding the inclusion or exclusion of this approach, but a recommendation could be made on other grounds; D = there is fair evidence to not support the recommendation of this approach; E = there is good evidence to not support the recommendation of this approach; and I = there is insufficient evidence to assess the effects on health outcomes due to a limited number of studies, important flaws in the design or conduct of the study, gaps in the evidence, or lack of information on important health outcomes.

RESULTS

For this critical review, 21 treatment studies were identified that met the defined criteria. Study summaries and limitations are presented in Table 1, and clinical practice recommendations based on the U.S. and Canadian task force methodology are outlined in Table 2.

Psychological Interventions

Interpersonal psychotherapy. Several studies evaluated the effectiveness of interpersonal psychotherapy (IPT) for the treatment of postpartum depression. In a descriptive study, U.S. researchers evaluated an adapted form of IPT in which the modifications included an emphasis on assisting participants to resolve marital disputes and major role transitions that frequently occur in

Table 1. Summary of Postpartum Depression (PPD) Treatment Studies

Study	Design	Participants	Intervention
Interpersonal psychotherapy			
Stuart and O'Hara (1995)[22]	Single group	6 US women on average 4 mo postpartum Identified using DSM-III-R criteria	12 wk of IPT with modifications to include assistance with marital disputes and major role transitions
O'Hara et al (2000)[26]	Randomized controlled trial Group allocation based on a random numbers table Power analysis Intent-to-treat	120 US women Multi-stage community screening Identified using diverse measures including SCID and HAM-D	Twelve 60-min individual sessions by trained therapists during a 12-wk period in standard fashion according to manual guidelines
Klier et al (2001)[27]	Single group	17 Austrian women between 4 and 45 wk postpartum presenting to a maternal mental health service either through referral or advertisement Identified using DSM-IV and HAM-D	Two 60-min individual sessions to explain IPT, 9 weekly 90-min group sessions, one 60-min individual termination session, and telephone numbers of other group members for support
Clark et al (2003)[28]	Quasi-experimental Waiting-list control group	39 US women recruited through health care providers and flyers Screened using DSM-IV	2 intervention groups: (1) IPT that consisted of 1.5-h initial evaluation and 12 weekly 1-h individual therapy sessions, (2) mother-infant therapy that consisted of 12 weekly 1.5-h sessions that incorporated a mothers' group, concurrent infant developmental therapy group that assisted infants in becoming more emotionally regulated, and a mother-infant dyadic group to promote responsive mother-infant interactions
Cognitive-behavioral therapy			
Appleby et al (1997)[30]	Randomized controlled trial Random allocation by computer-generated numbers Double-blind Intent-to-treat	87 women from the United Kingdom at 6 to 8 wk postpartum Identified using RDC criteria	4 study groups: (1) fluoxetine and 1 CBT session, (2) fluoxetine and 6 CBT sessions, (3) placebo and 1 CBT session, or (4) placebo and 6 CBT sessions Sessions derived for health visitors after brief training but provided by a psychologist with no previous clinical experience over 12 wk
Prendergast and Austin (2001)[31]	Randomized controlled trial	37 Australian women Screened by early childhood nurses Identified using EPDS and clinical interview	6 weekly 60-min home-based CBT sessions by trained early childhood nurses
Chabrol et al (2002)[32]	Quasi-experimental	48 French women Screened using EPDS Verified using HAM-D and BDI	5 to eight 1-h weekly home visits that had 4 components (supportive, educational, cognitive-behavioral, and psychodynamic)
Cooper et al (2003)[33]	Randomized controlled trial Power analysis Intent-to-treat	193 primiparous women from the United Kingdom Screened using mailed EPDS Verified with DSM-III-R	3 intervention groups: (1) CBT focused on mother-identified problems with infant (e.g., feeding, sleeping), (2) psychodynamic therapy that explored mother's own early attachment history, (3) nondirective counseling that provided mothers with an opportunity to discuss current feelings All interventions were provided at the mother's home on a weekly basis from 8 to 18 wk postpartum
Meager and Milgrom (1996)[34]	Pilot randomized controlled trial Waiting-list control group	20 Australian women with severe and long-standing PPD that developed within 6 mo were recruited by local hospitals and maternal health centers EPDS and BDI	10 weekly 1.5-h group sessions based on CBT conducted by a clinical psychologist Women exchanged telephone numbers and met outside the program
Honey et al (2002)[35]	Randomized controlled trial	45 women from the United Kingdom attending mother and baby clinics referred by a health visitor Identified using EPDS > 12 criteria	8 weekly, 2-h meetings facilitated by a health visitor comprising 3 components: (1) information on PPD, strategies for coping with difficult childcare situations, and eliciting social support; (2) CBT techniques related to motherhood anxiety; and (3) teaching about relaxation
Peer support			
Fleming et al (1992)[45]	Quasi-experimental	142 Canadian women recruited on postpartum wards to return screening instrument at 2 wk Identified using CES-D and EPDS	2 intervention groups: (1) 8 weekly semistructured group sessions lasting 2 h provided by 2 psychologists and (2) "group by mail" in which transcripts of the preceding support group were mailed to women

Outcome Measure	Results	Limitations
PPD posttreatment HAM-D, BDI, EPDS	Significant reduction in depression scores	Small sample size Lack of a control group Intervention provider was not reported
PPD at 4-, 8-, and 12-wk postrandomization HAM-D, BDI	Significant group differences	Participants were mostly educated, white, married women Clinical interviewers were not blinded to group allocation
PPD posttreatment and 6-mo follow-up EPDS, HAM-D	Significant reduction in depression scores	Small sample size Lack of a control group Possible cointervention through the provision of peer support outside of the group setting 35% of participants terminated intervention early Investigator-based assessments of treatment outcome
PPD posttreatment BDI, CES-D	Significant reduction in depression scores within the treatment groups using CES-D but not BDI	Small sample size Sequential group assignment While complete data were available for 58 families, only women with BDI scores > 16 (N = 39) were included in the analysis Children ranged in ages from 1 to 24 mo
PPD at 1-, 4-, and 12-wk posttreatment EPDS, HAM-D, and clinical interview	Significant reduction in depression scores in all treatment groups	Significant number of eligible women declined participation due to reluctance to take antidepressant medication No true control group (no treatment)
PPD posttreatment and 6-mo follow-up EPDS, MADRS	No significant group difference	Small sample size Inexplicit randomization process Significant group differences in baseline EPDS 70% of control early childhood nurses used some form of problem-solving and pleasant-event scheduling providing significant similarities to the intervention.
PPD posttreatment EPDS, HAM-D, BDI	Significant group difference	Small sample size Nonrandom group allocation High initial dropout after group assignment
PPD posttreatment and at 9-, 18-, and 60-mo postpartum EPDS, SCID	Significant difference between treatment groups and control group at posttreatment only	Poor randomization method—study recruiter selected 1 of 4 colored balls from a bag with the assignment of each therapy to a different colored ball
PPD posttreatment EPDS, BDI, POMS	Significant reduction in depression scores within the treatment group	Small sample size Inexplicit randomization process 40% of women were taking antidepressant medication 40% of participants terminated intervention early Possible cointervention through the provision of peer support outside of the group setting
PPD posttreatment and 6-month follow-up EPDS	Significant reduction in depression scores	Small sample size Inexplicit randomization process
PPD at 6 wk and 5 mo CES-D	No significant group difference	Nonrandom group allocation Significant differences in group sizes Depressed and nondepressed women participated in all study groups Weak measure of PPD

continued

Table 1. Summary of Postpartum Depression Treatment Studies (cont.)

Study	Design	Participants	Intervention
Peer support (cont.)			
Chen et al (2000)[47]	Randomized controlled trial	60 Chinese women recruited on postpartum wards to return screening instrument at 3 wk Identified using BDI	4 weekly semistructured group sessions lasting 1.5 to 2 h and facilitated by a nurse
Morgan et al (1997)[48]	Single group	34 Australian women, including 20 partners Identified using EPDS	8 weekly 2-h group sessions and 1 couple session facilitated by a nurse and occupational therapist Telephone support from facilitators and referral available between groups if required
Dennis (2003)[50]	Pilot randomized controlled trial Random allocation using sealed envelopes Intent-to-treat	42 Canadian women Screened by public health nurses during immunization clinic Identified using EPDS	Individualized telephone-based support provided by a mother recruited from the community who previously experienced PPD and received a 4-h training session
Partner support			
Misri et al (2000)[51]	Randomized controlled trial	29 Canadian women who met the DSM-IV criteria for major depressive disorder with postpartum onset	7 psychoeducational visits with a psychiatrist during which the mother's partner participated in 4 of the 7 sessions
Nondirective counseling			
Holden et al (1989)[56]	Randomized controlled trial Group allocation based on random numbers	50 women from the United Kingdom Community-based EPDS screening at 6 wk with a second screening at 13 wk via psychiatric interview	8 weekly counseling visits at home by health visitors trained in nondirective counseling
Wickberg and Hwang (1996)[57]	Randomized controlled trial	31 Swedish women 2-stage population-based screening at 8 and 12 wk using EPDS	6 weekly 1-h counseling visits at home by nurses trained in nondirective counseling
Cooper et al (2003)[33]	See Cognitive-Behavioral Therapy		
Relaxation/massage therapy			
Field et al (1996)[61]	Randomized controlled trial	32 depressed U.S. adolescent women Identified using BDI	2 study groups: (1) 30-min massage per day on 2 consecutive days per wk for 5 consecutive wk, (2) 30-min relaxation session (including yoga and muscle relaxation) per day on 2 consecutive days per wk for 5 consecutive wk
Onozawa et al (2001)[63]	Randomized controlled trial	34 primiparous women from the United Kingdom at 4 wk postpartum Identified using EPDS	5 weekly 1-h infant massage classes and a 30-min informal support group
Sleep interventions			
Hiscock and Wake (2002)[67]	Randomized controlled trial Group allocation via pregenerated block sizes of 2 to 10 Power analysis Intent-to-treat	156 Australian mothers of infants aged 6 to 12 mo with severe sleep problems Subgroup of women categorized as depressed Identified using EPDS	3 private consultations with a senior pediatric trainee held every 2 wk at the local maternal and child health center, where sleep management plans were tailored according to individual needs
Mother-infant relationship therapy			
Clark et al (2003)[28]	See Interpersonal Psychotherapy		
Cooper et al (2003)[33]	See Cognitive-Behavioral Therapy		
Exercise			
Armstrong and Edwards (2002)[74]	Randomized controlled trial Power analysis	20 Australian mothers who had given birth in the past 12 mo and were experiencing depressive symptomatology Identified using EPDS > 12 criteria	12-week exercise program consisting of pram walking session 3 times per week and a weekly informal gathering for a chat and play with the children

Abbreviations: BDI = Beck Depression Inventory, CBT = cognitive-behavioral therapy, CES-D = Center for Epidemiological Studies Depression Scale, IPT = interpersonal psychotherapy, MADRS = Montgomery-Asberg Depression Rating Scale, POMS = Profile of Mood States,

Outcome Measure	Results	Limitations
PPD posttreatment BDI	Significant group difference	Only 44% of mothers returned screening questionnaire Inexplicit randomization process Unstandardized intervention Data analysis was not intent-to-treat
PPD posttreatment and at 12 mo EPDS, GHQ	Significant reduction in depression scores	Small sample size Atypical sample (74% had spent 1 wk in a residential unit to help with mothering issues) Lack of a control group Cointerventions, as 50% were receiving additional treatment by a health professional and some were on antidepressant medication
PPD at 4- and 8-wk postrandomization EPDS	Significant group difference	Small sample size
PPD posttreatment and 4-wk follow-up EPDS	Significant group difference at 4-wk follow-up but not immediately posttreatment	Small sample size Significant group difference in baseline characteristics related to their partners' marriage appraisals Inexplicit randomization process
PPD at 13-wk postrandomization EPDS, clinical interview	Significant group difference	Small sample size 3 women in each group were considered to have taken antidepressant medication at a therapeutic level
PPD at 6-wk postrandomization Modified MADRS	Significant group difference	Small sample size Inexplicit randomization process
PPD at session 1 and 10 POMS 14-item depression scale	Only massage therapy had a significant immediate effect on depression scores	Small sample size Lack of a true control group Inexplicit randomization and trial procedures Weak measure of PPD Expressed disappointment may have influenced physiologic results
PPD posttreatment EPDS	Significant group difference Greatest reduction in depression occurred before the intervention	Small sample size Inexplicit randomization process High attrition rate with the massage group Data analysis was not intent-to-treat
PPD at 8- and 16-wk postrandomization EPDS	Significant group difference for the subgroup of women with baseline EPDS > 9	67% of eligible mothers accepted trial participation 56% of participants had EPDS scores < 10 at the start of the trial, making a significant reduction in scores unlikely
PPD at 6- and 12-wk postintervention initiation EPDS	Significant reduction in depression scores	Small sample size

EPDS = Edinburgh Postnatal Depression Scale, GHQ = General Health Questionnaire, HAM-D = Hamilton Rating Scale for Depression, RDC = Research Diagnostic Criteria, SCID = Structured Clinical Interview for DSM-III-R.

Table 2. Summary of Quality of Evidence and Practice Recommendations for Treatment Interventions[a] in Postpartum Depression

Intervention Strategy	Study	Research Design Rating[b]	Quality Rating[c]	Classification of Recommendation[d]
Psychological				
Interpersonal psychotherapy	Stuart and O'Hara (1995)[22]	Descriptive: III	Poor	I[e]
	O'Hara et al (2000)[26]	Randomized controlled trial: I	Fair	I[e]
	Klier et al (2001)[27]	Descriptive: III	Poor	I[e]
	Clark et al (2003)[28]	Quasi-experimental: II-1	Poor	I[e]
Cognitive-behavioral therapy	Appleby et al (1997)[30]	Randomized controlled trial: I	Fair	I[e]
	Prendergast and Austin (2001)[31]	Randomized controlled trial: I	Poor	I[e]
	Chabrol et al (2002)[32]	Quasi-experimental: II-1	Poor	I[e]
	Cooper et al (2003)[33]	Randomized controlled trial: I	Fair	I[e]
	Meager and Milgrom (1996)[34]	Pilot randomized controlled trial: I	Poor	I[e]
	Honey et al (2002)[35]	Randomized controlled trial: I	Poor	I[e]
Psychosocial				
Peer support	Fleming et al (1992)[45]	Quasi-experimental: II-1	Poor	I
	Chen et al (2000)[47]	Randomized controlled trial: I	Poor	I
	Morgan et al (1997)[48]	Descriptive: III	Poor	I
	Dennis (2003)[50]	Pilot randomized controlled trial: I	Fair	I
Partner support	Misri et al (2000)[51]	Randomized controlled trial: I	Poor	I
Nondirective counseling	Holden et al (1989)[56]	Randomized controlled trial: I	Fair	B
	Wickberg and Hwang (1996)[57]	Randomized controlled trial: I	Fair	B
	Cooper et al (2003)[33]	Randomized controlled trial: I	Fair	B
Other				
Relaxation/massage therapy	Field et al (1996)[61]	Randomized controlled trial: I	Poor	I
	Onozawa et al (2001)[63]	Randomized controlled trial: I	Poor	I
Infant sleep intervention	Hiscock and Wake (2002)[67]	Randomized controlled trial: I	Fair	I
Mother/infant relationship therapy	Clark et al (2003)[28]	Quasi-experimental: II-1	Poor	I
	Cooper et al (2003)[33]	Randomized controlled trial: I	Fair	I
Exercise	Armstrong and Edwards (2003)[74]	Pilot randomized controlled trial	Fair	I

[a]Based on guidelines of the U.S. Preventive Services Task Force and the Canadian Task Force on Preventive Health Care.[21]
[b]I = evidence from randomized controlled trial(s); II-1 = evidence from controlled trial(s) without randomization; II-2 = evidence from cohort or case-control analytic studies, preferably from more than 1 center or research group; II-3 = evidence from comparisons between times or places with or without the intervention; dramatic results in uncontrolled experiments could be included here; III = opinions of respected authorities based on clinical experience, descriptive studies, or reports of expert committees.
[c]Good = a study (including meta-analyses or systematic reviews) that meets all design-specific criteria well; Fair = a study (including meta-analyses or systematic reviews) that does not meet (or it is not clear that it meets) at least 1 design-specific criterion but has no known "fatal flaw"; Poor = a study (including meta-analyses or systematic reviews) that has at least 1 design-specific "fatal flaw" or an accumulation of lesser flaws to the extent that the results of the study are not deemed able to inform recommendation.
[d]A = there is good evidence to recommend this approach; B = there is fair evidence to recommend this approach; C = the existing evidence is conflicting and does not allow making a recommendation for or against use of this approach; however, other factors may influence decision-making; D = there is fair evidence to recommend against this approach; E = there is good evidence to recommend against this approach; I = there is insufficient evidence (in quantity and/or quality) to make a recommendation; however, other factors may influence decision-making.
[e]There is evidence based on the general depression research to recommend this approach.

the postpartum period.[22] Six women who met DSM-III-R criteria for major depression were treated for 12 weeks. Significant changes for all measures were found posttreatment using the Hamilton Rating Scale for Depression (HAM-D),[23] the Edinburgh Postnatal Depression Scale (EPDS),[24] and the Beck Depression Inventory (BDI).[25] This pilot work was advanced in a well-designed U.S. trial in which 120 postpartum women meeting DSM-IV criteria for major depressive disorder were recruited from the community and randomly assigned to either 12 weeks of IPT (N = 60) or a waiting-list condition control group (N = 60).[26] Follow-up data were collected via interview and self-report assessments of depressive symptomatology every 4 weeks; 99 (83%) of the 120 women completed the protocol. Significantly more women who received IPT recovered from their depressive episode based on HAM-D scores of 6 or less (37.5%) and BDI scores of 9 or less (43.8%) compared with women in the waiting-list control group (13.7% and 13.7%, respectively).

IPT has also been evaluated in a group modality. In an Austrian study, 17 women meeting DSM-IV criteria for depression participated in an IPT intervention that consisted of 2 individual introductory sessions, 9 group sessions, and 1 final individual termination session.[27] Mean score comparisons revealed significant changes from baseline to posttreatment for both the EPDS and HAM-D. At posttreatment, 10 (59%) mothers demonstrated full remission (HAM-D < 9), 5 (29%) established partial remission (score decrease > 50%), and 2 (12%) showed no improvement. Follow-up assessments at 24 weeks demonstrated a continued treatment effect.

In a recent quasi-experimental study, 39 U.S. women who met DSM-IV criteria for major depressive disorder were sequentially assigned to a waiting-list control group (N = 11) or 1 of the following 2 intervention groups: IPT (N = 15) or mother-infant therapy (N = 13).[28] Participants in the active treatment groups completed pre- and posttreatment (12 weeks) assessments, while those in the con-

trol group were assessed at study entry and 12 weeks later. Although there was no significant group difference in relation to BDI scores, women in both the mother-infant therapy and IPT groups had significantly lower Center for Epidemiological Studies Depression Scale (CES-D)[29] scores in comparison with the waiting-list control group ($F = 3.60$, $p = .04$).

Cognitive-behavioral therapy. Six studies evaluated a cognitive-behavioral therapy (CBT) intervention in the treatment of postpartum depression. In a randomized controlled trial in the United Kingdom to assess the clinical efficacy of fluoxetine combined with at least 1 session of counseling, postpartum women were assigned to 1 of 4 treatment groups: fluoxetine or placebo plus 1 or 6 sessions of counseling.[30] The 30-minute to 1-hour counseling sessions were derived from CBT principles and designed to be delivered by nonspecialists after brief training. Eighty-seven women who satisfied Research Diagnostic Criteria (RDC) for major (N = 51) and minor (N = 36) depression at 6 to 8 weeks postpartum participated, with 61 (70%) completing the 12 weeks of treatment. Depressive symptomatology was assessed at 1, 4, and 12 weeks of treatment using the EPDS, HAM-D, and a revised clinical interview. While improvements were seen in all 4 treatment groups, the progress in participants receiving fluoxetine was significantly greater than in those receiving placebo, and 6 counseling sessions had a significantly greater effect than 1 single session. These differences were evident after 1 week, and improvement in all groups was complete after 4 weeks. The interaction between counseling and fluoxetine was not statistically significant.

In an Australian trial, postpartum women were recruited through regular screening by early childhood nurses (ECNs) using the EPDS (score > 12) and diagnostically assessed by a clinical interview.[31] Women with DSM-IV major depressive disorder were then randomly assigned to either a usual care control group (N = 20), which incorporated 6 weekly clinic visits, or an intervention group (N = 17), which consisted of 6 weekly home-based sessions by one of the CBT-trained ECNs. Two stages of follow-up were undertaken: an interview immediately posttreatment and a postal questionnaire at 24 weeks. While there was a statistically significant difference in the EPDS scores between the 2 groups at baseline (intervention group mean score = 15.9 vs. control group mean score = 13.7), no group differences were found posttreatment or at the 24-week follow-up. However, there was a very high rate of recovery at initial follow-up, with up to 80% of all participants having an EPDS score < 10. While this trial suggests that ECNs can provide a modified CBT intervention, for most of this sample with mild to moderate depression, perceived support from an ECN (forming an integral part of both the baseline assessment interview and control condition) appears to be as effective as modified CBT.

In a French trial, pregnant women were screened with the EPDS during an obstetric clinic. Women at risk of postpartum depression (EPDS score > 8) (N = 258) were alternately assigned to either an intervention or control group.[32] At 4 to 6 weeks postpartum, women with probable depression (EPDS score > 10) were assessed using the HAM-D and BDI. Participants with major depression continued in the control group (N = 30) or the intervention group (N = 18), which consisted of a CBT program of 5 to 8 home visits (mean = 6.6, SD = 1.6). A significantly greater proportion of participants in the intervention group than those in the control group recovered based on HAM-D, EPDS, and BDI scores. In particular, recovery rates (HAM-D score < 7) were 66.6% for the intervention group versus 6.6% for the control group.

To evaluate the long-term effect of 3 psychological treatments on maternal mood, 193 primiparous women from the United Kingdom with postpartum depression were randomly assigned to either routine primary care (N = 52) or 1 of 3 interventions: CBT (N = 43), psychodynamic therapy (N = 50), or nondirective counseling (N = 48). Of the 193 women randomly assigned to the 4 study groups, 171 (88.6%) completed therapy.[33] The intervention was provided in-home from 8 to 18 weeks postpartum, and all participants were assessed immediately posttreatment (at 4.5 months) and at 9, 18, and 60 months postpartum. While all 3 interventions significantly decreased EPDS scores at 4.5 months in comparison with the control group, only psychodynamic therapy produced a reduction in depression rates (Structured Clinical Interview for DSM-III-R) significantly superior to that of the control group. However, the treatment effect was no longer apparent at 9 months postpartum, nor did the treatment reduce subsequent episodes of postpartum depression.

CBT has also been evaluated using a group modality. In a pilot trial, 20 Australian women recruited via local hospitals and maternal health centers were eligible for participation if their depression developed within 24 weeks of delivery and they had an EPDS score > 12 and a BDI score > 15.[34] Consenting women were randomly assigned to either a waiting-list control group (N = 10) or an intervention group (N = 10), which consisted of a 10-week group program based on CBT principles that targeted postpartum depression risk factors. Six of the mothers in the intervention group completed the program and provided follow-up data. While the intervention resulted in a statistically significant improvement in depressive symptomatology, due to the initial severity of postpartum depression, many women were still moderately depressed following treatment. In contrast, depressive symptomatology in the control group did not change over the 10-week period.

Finally, 45 women from the United Kingdom attending mother and baby clinics were eligible for participation in

a study by Honey et al. if their most recent child was younger than 12 months and if they had an EPDS score > 12.[35] Consenting women were randomly assigned to either routine primary care provided by home visitors (N = 22) or an intervention group (an 8-week psychoeducational group; N = 23). While there was no significant difference between the percentages of women in the intervention and control groups scoring < 13 on the EPDS immediately posttreatment (35% versus 27%, respectively), a significantly higher percentage of women in the intervention group scored < 13 on the EPDS 6 months posttreatment (65% versus 36%, respectively). Posttreatment antidepressant use did not account for the improvement in follow-up mood scores.[35]

Psychosocial Interventions

Peer support. Detailed analyses of social support variables in predictive studies suggest that the following social deficiencies significantly increase the risk of postpartum depression: (1) not having someone to talk openly with who has shared and understood a similar problem,[36] (2) lacking an intimate confidant or friend to converse with,[36–39] (3) not receiving support without having to ask for it,[36] and (4) feeling socially isolated.[40] Conversely, companionship and belonging to a group of similar others has a protective effect.[41] In interviews with depressed mothers (N = 60) participating in a population-based study, women were asked for their own explanations as to why they experienced postpartum depression; "lack of support" and "feeling isolated" were the most common responses.[42] When the participants were asked what advice they would give to new mothers currently suffering from postpartum depression, the foremost suggestion proffered was "find someone to talk to." These findings support several researchers who have recommended the provision of peer (mother-to-mother) support in a group modality for women experiencing postpartum depression.[43,44] However, the results from 3 investigations are equivocal. In a Canadian study, the effect of a support group was evaluated through the recruitment of women on the second day postpartum who were asked to complete and return a set of mood scales via mail during the first 2 weeks postpartum.[45] Of the 1081 questionnaires distributed over a 3-year period, 781 (72%) were returned, with 156 women scoring > 13 on the EPDS or 21 on the Multiple Affect Adjective Checklist. Seventy-six mothers with depressive symptomatology (48% of all depressed mothers) and 76 nondepressed mothers were recruited into the study. Participants were nonrandomly assigned to 1 of 3 groups: an 8-week postpartum support group (N = 44), a "group-by-mail" group (participants received scripts via mail that were adapted from the support group sessions; N = 15), or a control group (usual postpartum care; N = 83). All groups included participants who were depressed and nondepressed, and women completed the CES-D at 6 and 20 weeks postpartum. While most participants experienced an improvement in mood from 2 to 20 weeks postpartum regardless of group allocation, the support group interventions did not significantly alleviate depressive symptomatology. In addition to serious methodological weaknesses, theoretical limitations also existed, as research suggests that depressed individuals prefer to interact with others who are depressed and frequently feel worse after speaking with nondepressed people.[46] As such, the finding that depressed women felt worse after the support group meetings, which included nondepressed women, was not unexpected.

Recognizing this theoretical principle, a Chinese trial evaluated the effect of weekly support group meetings for women who were *all* experiencing postpartum depression.[47] Women were recruited in-hospital on the second or third day postpartum to complete a mailed BDI at 3 weeks postpartum. Eighty-five percent of women approached agreed to participate (N = 941) with 414 returning the completed BDI. Sixty women with BDI scores > 9 were randomly assigned to either a support group (N = 30) or a control group (usual postpartum care; N = 30). At the 4-week assessment, 60% (N = 18) of women in the control group exhibited depressive symptomatology in comparison with only 33% (N = 10) of those in the support group.

Finally, a group program for postnatally "distressed" Australian women and their partners was evaluated.[48] The program consisted of 8 weekly 2-hour sessions, including 1 session for the couple, facilitated by an occupational therapist and nurse in a setting in which psychotherapeutic and CBT strategies were employed. The results from 6 separate groups are reported, in which 34 couples participated; only 1 woman dropped out and attendance was over 90%. Participants completed the EPDS and General Health Questionnaire[49] during the first and last session and were followed up at 12 months. At program initiation, 66% of women had EPDS scores > 12, which decreased to 22% at the final session, and no participant exhibited depressive symptomatology at the 12-month follow-up.

Transcending the typical group modality, a pilot trial evaluating the effect of telephone-based peer support on depressive symptomatology was conducted.[50] Canadian women who scored > 9 on the EPDS were identified through region-wide screening at 8-week immunization clinics managed by public health nurses. Forty-two eligible and consenting women were randomly assigned to either a control group (standard postpartum care; N = 22) or a peer support group (N = 20). Blinded research assistants conducted follow-up at 4 and 8 weeks postrandomization. At the 4-week assessment, 40.9% (N = 9) of women in the control group scored > 12 on the EPDS in comparison with only 10% (N = 2) in the peer support group. Similar findings were found at the 8-week assessment during which 52.4% (N = 11) of women in the control group continued to score > 12 on the EPDS in

comparison with 15% (N = 3) of mothers in the peer support group.

Partner support. In a Canadian trial to determine the impact of partner support, women who met DSM-IV criteria for major depressive disorder with postpartum onset were randomly allocated to either a control group (7 psychoeducational visits with a psychiatrist; N = 13) or an intervention group (7 psychoeducational visits with a psychiatrist during which the woman's partner participated in 4 of the sessions; N = 16).[51] Immediately postintervention, no significant differences in mean EPDS scores existed between the intervention (mean score = 11.4, SD = 6.2) and control (mean score = 14.6, SD = 7.2; p = .20) groups. However, at the 4-week follow-up, significant group differences were found favoring the intervention group (mean score = 8.6, SD = 5.2 vs. mean score = 14.7, SD = 7.2; p = .013).

Nondirective counseling. The importance of nondirective counseling, sometimes called "listening visits," has been highlighted in the literature.[52–55] To determine the effectiveness of this treatment approach, 55 women from the United Kingdom identified as depressed through community-based EPDS screening at 6 weeks postpartum and a home psychiatric interview at 13 weeks were randomly assigned to either a control group (routine primary care) or a nondirective counseling group.[56] Fifty of the 55 participants completed the trial: 26 in the counseling group and 24 in the control group. After a mean time interval of 13 weeks, a psychiatrist blinded to group allocation reassessed the women. According to RDC criteria, 18 (69%) women in the counseling group had fully recovered in comparison with only 9 (38%) women in the control group. When women in the counseling group were asked whether they had received any help for their depression, 23 (88%) women responded that talking to their health visitor had been the most important recovery factor. However, one third of the counseled women did not recover despite the intervention. Of this subgroup, 2 women had a long history of depression, 1 had postpartum depression previously, and 2 had a family history of depression, signifying that postpartum depression occurring in the context of a continuum of psychiatric disturbances may be less likely to respond to a psychosocial intervention.

Extending these findings, Wickberg and Hwang[57] conducted a population-based trial to evaluate the effect of counseling among Swedish women. Mothers participated in a 2-stage screening procedure, completing the EPDS at 8 and 12 weeks postpartum. Women who scored > 11 on both screening occasions were interviewed at home by a clinical psychologist blinded to EPDS scores and at 13 weeks postpartum using the Montgomery-Asberg Depression Rating Scale (MADRS).[58] Women who were identified as depressed according to DSM-III-R criteria were randomly allocated to receive either routine primary care (N = 16) or nondirective counseling (N = 15). Twelve (80%) women who received counseling were fully recovered after the intervention in comparison with 4 (25%) mothers in the control group. As indicated previously, nondirective counseling was evaluated by Cooper and colleagues,[33] who also found salutary short-term treatment effects.

Other Interventions

Relaxation/massage therapy. Massage and relaxation therapies have been shown to decrease anxiety and elevate mood.[59,60] To determine the effects of massage and relaxation therapies on postpartum depression, 32 U.S. in-hospital adolescent mothers, who were determined to be depressed based on a BDI score > 16, were recruited and randomly assigned to either a massage therapy group (N = 16) or relaxation therapy group (N = 16).[61] The effects of the massage and relaxation therapies were assessed pre- and posttreatment on the first and last day of the sessions using the Profile of Mood States 14-item depression subscale (POMS-D).[62] Results suggest that there was no difference in POMS-D scores in relation to relaxation therapy, but there was a significant difference in pre- and posttreatment scores on days 1 and 10 in relation to massage therapy. However, the long-term effect of these therapies is unknown, resulting in questionable clinical utility.

While diminishing maternal depression does not necessarily improve mother-infant interactions, direct attempts to enhance the quality of mother-infant interactions, independently of improving maternal depression, have been reported with some success. To determine whether attending regular massage classes could reduce maternal depression and also enrich the quality of mother-infant interactions, a trial was conducted involving 34 primiparous women from the United Kingdom identified as being depressed following the completion of the EPDS at 4 weeks postpartum.[63] Participants were randomly allocated to either an intervention group (5 weekly 1-hour infant massage classes and a 30-minute informal support group; N = 19) or a control group (5 weekly informal support groups; N = 15). Twelve women in the intervention group and 13 women in the control group completed all sessions (73.5%). Results suggest that there was a greater improvement in EPDS scores in the intervention group than in the control group; the median EPDS score for the intervention group at the final session was 5.0 (95% CI = 8.0 to 14.2) in comparison with 10.0 (95% CI = 4.6 to 9.0) for women in the control group. However, it should be noted that much of the effect occurred *before* the classes began, possibly reflecting expectation.

Infant sleep interventions. Commonly used behavioral interventions have been shown to decrease infant sleep problems and maternal reports of depressive symptomatology; however, uncontrolled trials, small sample

sizes, and short follow-up render the results equivocal.[64–66] To address this issue, a well-designed trial was conducted with 156 Australian mothers of infants aged 6 to 12 months with severe sleep problems.[67] Participants were recruited from well-child clinics, and women randomly assigned to the intervention group (N = 78) received a "controlled crying" program delivered over 3 consultations with a pediatric trainee. Women also received information about the development and management of sleep problems and an information sheet about normal sleep patterns. Women in the control group (N = 78) were only mailed the information sheet. All participants completed the EPDS at 8 and 16 weeks postrandomization. At 8 weeks, women in the intervention group not only had significantly more r esolved sleep problems but also lower depressive symptomatology (mean change = –3.7, 95% CI = –4.7 to –2.7) than those in the control group (mean change = –2.5, 95% CI = –1.7 to –3.4; p = .06). For the subgroup of participants with baseline EPDS scores > 9, depression scores fell significantly further for women in the intervention group (mean change = –6.0, 95% CI = –7.5 to –4.0) than for women in the control group (mean change = –3.7, 95% CI = –4.9 to –2.6; p = .01) at 8 weeks; similar results were found at 16 weeks (p = .04).

Mother-infant relationship therapy. This treatment approach has been specifically included in 2 recent studies. In the trial described previously, Cooper and colleagues[33] included "psychodynamic therapy" as 1 treatment group that focused on assisting the mother in understanding her representation of her infant and their relationship by exploring aspects of the mother's own early attachment history. While mothers who received this intervention had significantly lower EPDS scores posttreatment at 4.5 weeks than women in the control group, long-term treatment effects were not demonstrated. Similarly, in a preliminary study conducted by Clark and colleages[28] (also described previously), mother-infant therapy was evaluated and involved 3 components: (1) a mother's group that provided therapeutic intervention and peer support; (2) a concurrent infant development therapy group that assisted infants in becoming more emotionally regulated, focused, and socially engaged; and (3) a mother-infant dyadic group with activities designed to promote sensitive, responsive mother-infant interactions. In this quasi-experimental study, the mother's group occurred concurrently with the infant's developmental therapy group, followed by the dyadic group. Significant group differences were found only in relation to CES-D scores and not to BDI scores.

Maternal exercise. While the benefits of exercise on maternal mental health have been suggested,[68–73] only 1 randomized controlled trial has been conducted to evaluate the effectiveness of exercise in the treatment of postpartum depression.[74] Twenty Australian mothers who had given birth in the past 12 months and were experiencing depressive symptomatology were randomly assigned to either an intervention group (12-week exercise and social support program; N = 10) or a control group (2 sessions of exercise over a 6-week period and phone support at week 6; N = 10). Pretest data of physical fitness levels and structured questionnaires were compared with posttest data. Mothers who received the intervention had significantly lower EPDS scores than did mothers in the control group at 12 weeks posttreatment (t = 8.96, p < .01). However, there was no significant group difference in levels of social support.[74]

One small study was conducted to assess mood changes in the postpartum period among women who exercised. Twenty women who had delivered a baby within the past year (mean = 12 weeks; SD = 4 weeks) completed the State-Trait Anxiety Inventory and the Profile of Mood States before and following either an exercise session (N = 10) or a quiet rest session (N = 10). Exercise consisted of 60 minutes of low-impact aerobic activity at intensity between 60% to 70% of maximal heart rate reserve. Quiet rest consisted of sitting quietly in a room free from distractions for 60 minutes. The results indicated that while anxiety and depression scores decreased significantly following exercise and quiet rest, exercise was associated with a significant decrease in total mood disturbance.[75]

DISCUSSION

There are several different psychological approaches to the treatment of postpartum depression. In this current review, 6 trials[30–35] were found evaluating the effectiveness of CBT related to postpartum depression, but all suffered significant methodological limitations, such as a small sample size or lack of a true control group. At this time, there is limited evidence regarding the inclusion or exclusion of this approach in postpartum depression treatment programs, but the primarily beneficial results suggest that further research is warranted. This research is particularly necessary considering CBT is an effective treatment for general depression, with a meta-analysis of 28 studies suggesting that, given over a mean of 14.9 weeks, this intervention is as beneficial as medication or other psychotherapies.[76] Correspondingly, in a large analysis of 4 trials, CBT fared as well as antidepressant medication with "severely" depressed outpatients in 4 major comparisons.[77] However, considerable time, commitment, and cost are required from participants, and approximately 10% to 40% fail to complete full treatment, a compliance rate similar to pharmacotherapy.[78]

Similarly, psychotherapies that target interpersonal and/or current psychological problems related to general depression have been shown to be more effective than long-term analytic psychotherapies.[79] In this review, 4 studies[22,26–28] were found evaluating the effectiveness of

IPT; however, only 1 investigation was a well-designed trial.[26] The results from this trial and the other smaller studies suggest that there is some evidence to support the recommendation that IPT may be effective in the treatment of postpartum depression. As such, structured CBT and IPT interventions hold promise and well-designed trials with large samples are warranted. Future investigations should include long-term follow-up after intervention discontinuation designed to determine the comparative effectiveness of pharmacologic and psychological treatments, using trained health professionals and standardized interventions.

Research has clearly demonstrated that a lack of social support is a significant predictor of postpartum depression. As such, peer support interventions have potentially beneficial effects in treating women who have mild to moderate depression or for women with no previous history of depression. Three studies[45,47,48] were found evaluating the effectiveness of professionally facilitated support groups. Unfortunately, theoretical limitations, such as the inclusion of both depressed and nondepressed women, and methodological weaknesses render the results equivocal. Well-designed trials with large, homogeneous samples are warranted. Future research should also include self-help groups (i.e., groups not facilitated by a health professional) to extend the testing of lay support models with mild to moderately depressed women, and evaluations of eligible mothers who decline group interventions should be conducted to identify potential help-seeking barriers. Evaluations of group interventions should also include measures that assess group dynamics and social comparisons to determine the salutary components of support groups. A new intervention that holds promise is telephone-based peer support, and a large randomized controlled trial (N = 700) with a full economic evaluation is currently under way in Toronto, Ontario, Canada.

One area that has received little attention is the role the spouse or partner plays in the prevention of or recovery from postpartum depression. Partners can be a good source of instrumental (e.g., sharing of childcare and domestic responsibilities) and emotional support and can be a mediating link between the mother and family members who may not understand the nature of postpartum depression. Further research is needed to identify the type and amount of social support that is most beneficial.

Three European trials[33,56,57] evaluated the effectiveness of nondirective counseling with positive results, suggesting this treatment modality may be a viable option for women with mild to moderate postpartum depression. This research has demonstrated the feasibility of population-based screening and the application of home visits using trained health professionals. Unfortunately, the immediate problem is the small sample size in all of these trials. Contextual factors also decrease the application of the results to a North American population where differences in the delivery of postpartum care exist. As such, a large randomized controlled trial is needed to replicate these auspicious results. Finally, maternal/infant massage therapy, infant sleep interventions, and mother-infant therapy all hold promise and, with further research, these interventions may be beneficial secondary treatment options.

Research Implications

This review clearly demonstrates that postpartum depression research presents many special methodological complexities that need to be considered if scientific knowledge is to progress. First, there are particular difficulties in defining the target group to be studied, as diagnosis is much less concrete than in other areas where an initial assessment can be confirmed by physiological tests. Second, many of the treatments used are hard to define with clarity, as psychological and psychosocial interventions often involve counseling and manipulation of the environment; replicating such treatment with fidelity is challenging. Third, the nature of the interventions employed frequently result in cointerventions. Fourth, there are difficulties in establishing the relative costs and benefits of treatment arising from the relapsing/remitting nature of postpartum depression. Finally, the context of postpartum depression research is crucial, as the cultural and organizational environment in which postpartum depression services take place is highly variable. For example, the same intervention can have differing effects depending on context and variations in the control group.

Many of the dilemmas with postpartum depression research begin from the way in which interventions are evaluated. In this review, we found limited agreement on outcome measures, although the EPDS was the most consistently used measure of depressive symptomatology. Most studies obtained no information on maternal perceptions, such as whether the women even liked the intervention. Although postpartum depression can occur within the first year postpartum, most trials had follow-up periods of less than 6 months. Of the trials conducted, most were small with a mean sample size of approximately 62 women, although 300 would be more appropriate to detect clinically significant changes in depressive symptomatology. There were also high attrition rates, especially with group interventions. Finally, examination of the wider impact of postpartum depression through economic evaluations was rarely conducted.

The challenge is to conduct methodologically rigorous randomized controlled trials, remembering that 1 expensive randomized controlled trial may prove more cost-effective than a large number of small studies with no meaningful results. To ensure that trials are well designed, the following points need to be considered. Difficulties in definition of postpartum depression should be confronted by using structured diagnoses or psychometrically tested self-report instruments such as the EPDS. Adequate

sample sizes based on power analyses should be incorporated so that the results can be compared across different postpartum samples. While researchers should consider multiple dimensions of improvement, trials should focus on a small number of clear outcomes in the interest of both clarity and decreasing participant burden. Long-term effects should be addressed by adequate length of follow-up. Trials should also be analyzed by intention-to-treat analysis without excluding those who drop out due to a change in treatment. Intervention replication can be achieved through a concise account of not only the intended but also the actual intervention in both the experimental and control groups. Finally, maternal evaluations should be included to understand the nature of the intervention as well as what are important outcomes.

At present, definite conclusions cannot be reached about the relative effectiveness of most of these nonbiological treatment approaches due to the lack of well-designed investigations. Randomized controlled trials are needed to compare different treatment modalities, examine the effectiveness of individual treatment components, and determine which treatments are most useful for women with different risk factors or clinical presentations of postpartum depression. As there is no single etiologic pathway by which women develop postpartum depression, it is improbable that a single treatment modality will be effective for all women. A multifactorial treatment approach, which combines the contributions of the psychological, psychosocial, and biological factors, is likely to be most beneficial, as it recognizes various etiologic factors and individual variations.

The first part in this 2-part series appears in this issue on pages 1242–1251.

Drug name: fluoxetine (Prozac and others).

REFERENCES

1. O'Hara M, Swain A. Rates and risk of postpartum depression: a meta-analysis. Int Rev Psychiatry 1996;8:37–54
2. World Health Organization. The World Health Report 2001: Mental Health: New Understanding, New Hope. Geneva, Switzerland: World Health Organization; 2001
3. Jiang HJ, Elixhauser A, Nicholas J, et al. Care of Women in US Hospitals, 2000. HCUP Fact Book 3. Rockville, Md: Agency for Healthcare Research and Quality; 2002
4. Cooper PJ, Murray L. Course and recurrence of postnatal depression: evidence for the specificity of the diagnostic concept. Br J Psychiatry 1995;166:191–195
5. Murray L, Fiori-Cowley A, Hooper R, et al. The impact of postnatal depression and associated adversity on early mother-infant interactions and later infant outcome. Child Dev 1996;67:2512–2526
6. Mayberry LJ, Affonso DD. Infant temperament and postpartum depression: a review. Health Care Women Int 1993;14:201–211
7. Hipwell AE, Goossens FA, Melhuish EC, et al. Severe maternal psychopathology and infant-mother attachment. Dev Psychopathol 2000; 12:157–175
8. Murray L. The impact of postnatal depression on infant development. J Child Psychol Psychiatry 1992;33:543–561
9. Cogill SR, Caplan HL, Alexandra H, et al. Impact of maternal postnatal depression on cognitive development of young children. Br Med J (Clin Res Ed) 1986;292:1165–1167
10. Cummings EM, Davies PT. Maternal depression and child development. J Child Psychol Psychiatry 1994;35:73–112
11. Murray L, Sinclair D, Cooper P, et al. The socioemotional development of 5-year-old children of postnatally depressed mothers. J Child Psychol Psychiatry 1999;40:1259–1271
12. Cohn JF, Tronick EZ. Three-month-old infants' reaction to simulated maternal depression. Child Dev 1983;54:185–193
13. Whiffen VE, Gotlib IH. Infants of postpartum depressed mothers: temperament and cognitive status. J Abnorm Psychol 1989;98:274–279
14. Cox AD, Puckering C, Pound A, et al. The impact of maternal depression in young children. J Child Psychol Psychiatry 1987;28:917–928
15. Breznitz Z, Friedman SL. Toddlers' concentration: does maternal depression make a difference? J Child Psychol Psychiatry 1988;29:267–279
16. Beck CT. Maternal depression and child behaviour problems: a meta-analysis. J Adv Nurs 1999;29:623–629
17. Orvaschel H, Walsh-Allis G, Ye WJ. Psychopathology in children of parents with recurrent depression. J Abnorm Child Psychol 1988;16: 17–28
18. Buist A. Childhood abuse, parenting and postpartum depression. Aust N Z J Psychiatry 1998;32:479–487
19. Boyce P. Personality dysfunction, marital problems and postnatal depression. In: Cox J, Holden J, eds. Perinatal Psychiatry: Use and Misuse of the Edinburgh Postnatal Depression Scale. London, England: Gaskell; 1994:82–102
20. Holden JM. Postnatal depression: its nature, effects, and identification using the Edinburgh Postnatal Depression scale. Birth 1991;18:211–221
21. Canadian Task Force on Preventive Health Care. The Canadian Guide to Clinical Preventive Health Care. Ottawa, Ontario, Canada: Canadian Task Force on Preventive Health Care; 2003
22. Stuart S, O'Hara MW. Interpersonal psychotherapy for postpartum depression: a treatment program. J Psychother Pract Res 1995;4:18–29
23. Hamilton M. A rating scale for depression. J Neurol Neurosurg Psychiatry 1960;23:56–62
24. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression: development of the 10-item Edinburgh Postnatal Depression Scale. Br J Psychiatry 1987;150:782–786
25. Beck AT, Steer RA, Garbin MC. Psychometric properties of the Beck Depression Inventory: twenty-five years of evaluation. Clin Psychol Rev 1988;8:77–100
26. O'Hara MW, Stuart S, Gorman LL, et al. Efficacy of interpersonal psychotherapy for postpartum depression. Arch Gen Psychiatry 2000;57: 1039–1045
27. Klier CM, Muzik M, Rosenblum KL, et al. Interpersonal psychotherapy adapted for the group setting in the treatment of postpartum depression. J Psychother Pract Res 2001;10:124–131
28. Clark R, Tluczek A, Wenzel A. Psychotherapy for postpartum depression: a preliminary report. Am J Orthopsychiatry 2003;73:441–454
29. Radloff LS. The CES-D scale: a self report depression scale for research in the general population. J Appl Psychol Measurement 1977;1:372–388
30. Appleby L, Warner R, Whitton A, et al. A controlled study of fluoxetine and cognitive-behavioural counselling in the treatment of postnatal depression. BMJ 1997;314:932–936
31. Prendergast J, Austin MP. Early childhood nurse-delivered cognitive behavioural counselling for post-natal depression. Australasian Psychiatry 2001;9:255–259
32. Chabrol H, Teissedre F, Saint-Jean M, et al. Prevention and treatment of post-partum depression: a controlled randomized study on women at risk. Psychol Med 2002;32:1039–1047
33. Cooper PJ, Murray L, Wilson A, et al. Controlled trial of the short- and long-term effect of psychological treatment of post-partum depression, 1: impact on maternal mood. Br J Psychiatry 2003;182:412–419
34. Meager I, Milgrom J. Group treatment for postpartum depression: a pilot study. Aust N Z J Psychiatry 1996;30:852–860
35. Honey KL, Bennett P, Morgan M. A brief psycho-educational group intervention for postnatal depression. Br J Clin Psychol 2002;41(Pt 4): 405–409
36. Brugha TS, Sharp HM, Cooper SA, et al. The Leicester 500 Project: social support and the development of postnatal depressive symptoms: a prospective cohort survey. Psychol Med 1998;28:63–79
37. Paykel ES, Emms EM, Fletcher J, et al. Life events and social support in puerperal depression. Br J Psychiatry 1980;136:339–346
38. Romito P, Saurel-Cubizolles MJ, Lelong N. What makes new mothers

unhappy: psychological distress one year after birth in Italy and France. Soc Sci Med 1999;49:1651–1661
39. O'Hara MW, Rehm LP, Campbell SB. Postpartum depression: a role for social network and life stress variables. J Nerv Ment Dis 1983;171: 336–341
40. Mills EP, Finchilescu G, Lea SJ. Postnatal depression: an examination of psychosocial factors. S Afr Med J 1995;85:99–105
41. Cutrona CE. Ratings of social support by adolescents and adult informants: degree of correspondence and prediction of depressive symptoms. J Pers Soc Psychol 1989;57:723–730
42. Small R, Johnston V, Orr A. Depression after childbirth: the views of medical students and women compared. Birth 1997;24:109–115
43. Eastwood P. Promoting peer group support with postnatally depressed women. Health Visit 1995;68:148–150
44. Pitts F. Comrades in adversity: the group approach. Health Visit 1995;68: 144–145
45. Fleming AS, Klein E, Corter C. The effects of a social support group on depression, maternal attitudes and behavior in new mothers. J Child Psychol Psychiatry 1992;33:685–698
46. Rosenblatt A, Greenberg J. Examining the world of the depressed: do depressed people prefer others who are depressed? J Pers Soc Psychol 1991;60:620–629
47. Chen CH, Tseng YF, Chou FH, et al. Effects of support group intervention in postnatally distressed women: a controlled study in Taiwan. J Psychosom Res 2000;49:395–399
48. Morgan M, Matthey S, Barnett B, et al. A group programme for postnatally distressed women and their partners. J Adv Nurs 1997;26:913–920
49. Goldberg DP, Hillier VF. A scaled version of the General Health Questionnaire. Psychol Med 1979;9:139–145
50. Dennis C. The effect of peer support on postpartum depression: a pilot randomized controlled trial. Can J Psychiatry 2003;48:61–70
51. Misri S, Kostaras X, Fox D, et al. The impact of partner support in the treatment of postpartum depression. Can J Psychiatry 2000;45: 554–558
52. Holden J. Postnatal depression: 'She just listened.' Community Outlook 1987:6–10
53. Clement S. 'Listening visits' in pregnancy: a strategy for preventing postnatal depression? Midwifery 1995;11:75–80
54. Gerrard J, Holden JM, Elliott SA, et al. A trainer's perspective of an innovative programme teaching health visitors about the detection, treatment and prevention of postnatal depression. J Adv Nurs 1993; 18:1825–1832
55. Davies BR, Howells S, Jenkins M. Early detection and treatment of postnatal depression in primary care. J Adv Nurs 2003;44:248–255
56. Holden JM, Sagovsky R, Cox JL. Counselling in a general practice setting: controlled study of health visitor intervention in treatment of postnatal depression. BMJ 1989;298:223–226
57. Wickberg B, Hwang CP. Counselling of postnatal depression: a controlled study on a population based Swedish sample. J Affect Disord 1996;39:209–216
58. Montgomery SA, Asberg M. A new depression scale designed to be sensitive to change. Br J Psychiatry 1979;134:382–389
59. McLean PD, Hakstian AR. Clinical depression: comparative efficacy of outpatient treatments. J Consult Clin Psychol 1979;47:818–836
60. Reynolds WM, Coats KI. A comparison of cognitive-behavioral therapy and relaxation training for the treatment of depression in adolescents. J Consult Clin Psychol 1986;54:653–660
61. Field T, Grizzle N, Scafidi F, et al. Massage and relaxation therapies' effects on depressed adolescent mothers. Adolescence 1996;31:903–911
62. McNair DM, Loot M, Droppleman L. Manual for the Profile of Mood States. San Diego, Calif: Educational and Industrial Testing Service; 1981
63. Onozawa K, Glover V, Adams D, et al. Infant massage improves mother-infant interaction for mothers with postnatal depression. J Affect Disord 2001;63:201–207
64. Leeson R, Barbour J, Romaniuk D, et al. Management of infant sleep problems in a residential unit. Child Care Health Dev 1994;20:89–100
65. Armstrong KL, Van Haeringen AR, Dadds MR, et al. Sleep deprivation or postnatal depression in later infancy: separating the chicken from the egg. J Paediatr Child Health 1998;34:260–262
66. Rickert VI, Johnson CM. Reducing nocturnal awakening and crying episodes in infants and young children: a comparison between scheduled awakenings and systematic ignoring. Pediatrics 1988;81:203–212
67. Hiscock H, Wake M. Randomised controlled trial of behavioural infant sleep intervention to improve infant sleep and maternal mood. BMJ 2002;324:1062–1065
68. Abraham S, Taylor A, Conti J. Postnatal depression, eating, exercise, and vomiting before and during pregnancy. Int J Eat Disord 2001;29: 482–487
69. May A. Using exercise to tackle postnatal depression. Health Visit 1995; 68:146–147
70. Nordhagen IH, Sundgot-Borgen J. Physical activity among pregnant women in relation to pregnancy-related complaints and symptoms of depression [in Norwegian]. Tidsskr Nor Laegeforen 2002;122:470–474
71. Wilkinson J, Phillips S, Jackson J, et al. "Mad for Fitness": an exercise group to combat a high incidence of postnatal depression. J Fam Health Care 2003;13:44–48
72. Currie J, Boxer E, Devlin E. Pramwalking as postnatal exercise and support: an evaluation of the Stroll Your Way To Well-Being program and supporting resources in terms of individual participation rates and community group formation. Aust J Midwifery 2001;14:21–25
73. Currie JL, Develin E. Stroll your way to well-being: a survey of the perceived benefits, barriers, community support, and stigma associated with pram walking groups designed for new mothers, Sydney, Australia. Health Care Women Int 2002;23:882–893
74. Armstrong K, Edwards H. The effects of exercise and social support on mothers reporting depressive symptoms: a pilot randomized controlled trial. Int J Ment Health Nurs 2003;12:130–138
75. Koltyn KF, Schultes SS. Psychological effects of an aerobic exercise session and a rest session following pregnancy. J Sports Med Phys Fitness 1997;37:287–291
76. Dobson KS. A meta-analysis of the efficacy of cognitive therapy for depression. J Consult Clin Psychol 1989;57:414–419
77. DeRubeis RJ, Gelfand LA, Tang TZ, et al. Medications versus cognitive behavior therapy for severely depressed outpatients: mega-analysis of four randomized comparisons. Am J Psychiatry 1999;156:1007–1013
78. Evans MD, Hollon SD, DeRubeis RJ, et al. Differential relapse following cognitive therapy and pharmacotherapy for depression. Arch Gen Psychiatry 1992;49:802–808
79. Elkin I, Shea MT, Watkins JT, et al. National Institute of Mental Health Treatment of Depression Collaborative Research Program: general effectiveness of treatments. Arch Gen Psychiatry 1989;46:971–982