Published in final edited form as:

J Fam Nurs. 2013 August ; 19(3): 295–323. doi:10.1177/1074840713484822.

Perinatal Dyadic Psychotherapy: Design, Implementation, and Acceptability

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Abstract

Maternal postpartum depression (PPD) and mother-infant relationship dysfunction have reciprocal effects on each other and thus an integrated approach that addresses both problems simultaneously may lead to improved outcomes. This study aimed to determine the feasibility, acceptability, and preliminary efficacy of a new intervention, Perinatal Dyadic Psychotherapy (PDP), for the early treatment of maternal PPD. PDP is designed to promote maternal mental health and facilitate optimal mother-infant relationships via (a) a supportive, relationship-based, mother-infant psychotherapeutic component, and (b) a developmentally-based infant-oriented component focused on promoting positive mother-infant interactions. This paper describes the pilot use of PDP with six acutely depressed postpartum women. Nurses delivered the intervention over eight home visits. Results indicate that PDP is a feasible, acceptable, and safe intervention with this population. All participants achieved remission of depression with significant reduction in of depression and anxiety symptoms, suggesting that PDP is a promising treatment for PPD.

Keywords

Postpartum depression; intervention; mother-infant relationship

Postpartum depression (PPD) is a common complication of childbirth affecting approximately 10–15% of women after the birth of a baby (Gaynes et al., 2005). PPD occurs during a critical period as a family adjusts to the addition of a newborn and the demanding work of caring for an infant. PPD can negatively affect this adjustment and can impair maternal functioning and mothering behavior, leading to detrimental effects on the young child. Mothers with PPD increase the risk of their children developing, (a) behavioral and social difficulties, (b) impaired cognitive and emotional development, and (c) long-term behavioral problems (Center on the Developing Child at Harvard University, 2009; Field, 1995; Grace, Evindar, & Stewart, 2003; Murray, 2009; Murray et al., 2011; National Research Council, 2009).

Although genetics and social conditions both play a role in the association of child development problems with maternal depression (Barry, Kochanska, & Philibert, 2008; Ford-Jones, Williams, & Bertrand, 2008; Oberlander et al., 2008), the preponderance of research indicates the negative consequences of PPD on the child are mediated by impaired interaction between a depressed woman and her infant (Field, 1998; Murray, Cooper, & Hipwell, 2003; NICHD Early Child Care Network, 1999; Tronick & Reck, 2009; van Doesum, Hosman, & Riksen-Walraven, 2005). Maternal sensitive responsiveness to the infant is widely construed to be one of the most crucial dimensions of mother-infant interaction and is known to predict positive outcomes in children, including attachment security (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003; Shin, Park, Ryu, & Seomun, 2008; van Doesum, Hosman, Riksen-Walraven, & Hoefnagels, 2007). A large body of research has demonstrated detrimental effects of PPD on maternal sensitive responsiveness and on the quality of mother-child interactions (Bakermans-Kranenburg et al., 2003; Belsky & Fearon, 2002; Kempainen, Kumpulainen, Moilanen, & Ebeling, 2006). In a meta-analysis of studies in this area (Lovejoy, Graczyk, O'Hare, & Neuman, 2000), depressed mothers of infants were found to show more irritability and hostility, more disengagement from their child, and lower rates of play and other positive social interactions with their child. Additionally, depressed mothers tend to (a) look at their infants less often, (b) show fewer positive facial expressions, (c) vocalize less, (d) touch their babies affectionately less often, and (e) show overall less sensitivity to their infants than non-depressed mothers (Cohn, Campbell, Matias, & Hopkins, 1990; Field, 1984; Fleming, Flett, Ruble, & Shaul, 1988; Herrera, Reissland, & Shepherd, 2004). Depressed mothers may be withdrawn and disengaged with flat affect, or they may be intrusive and over-stimulating (Cohn, Matias, Tronick, Connell, & Lyons-Ruth, 1986; Field, Healy, Goldstein, & Guthertz, 1990; Murray, Fiori-Cowley, Hooper, & Cooper, 1996). In response to a depressed mother, infants alter their interactive behavior, leading to a broad range of infant deficits including poor emotional and behavioral state regulation, fewer positive and more negative facial expressions, avoidance, and greater fussiness (Field et al., 1988; Field et al., 1990; Manian & Bornstein, 2009). An infant's altered behavior, in turn, may negatively affect the mother, with the resultant emergence of a negative pattern of mother-infant interaction (Tronick & Weinberg, 1997) which can further contribute to maternal depression and further child deficits (Sutter-Dallay, Murray, Glaigny-Dallay, & Verdoux, 2003).

Despite its prevalence and serious consequences, a very low percentage of depressed women receives treatment for PPD (Goodman & Tyer-Viola, 2010; Horowitz & Cousins, 2006; Marcus, Flynn, Blow, & Barry, 2003). Many women are reluctant to take medication during the postpartum period, even if not breastfeeding (Goodman, 2009) and instead overwhelmingly prefer psychotherapy for PPD treatment (Appleby, Warner, Whitton, & Faragher, 1997; Dennis & Chung-Lee, 2006; Goodman & Tyer-Viola, 2010). Various psychotherapies have shown efficacy in treating PPD, including supportive, interpersonal, cognitive behavioral, and psychodynamic therapies (Appleby et al., 1997; Clark, Tluczek, & Brown, 2008; Cooper, Murray, Wilson, & Romaniuk, 2003; Cuijpers, Brannmark, & van Straten, 2008; Glavin, Smith, Sorum, & Ellefsen, 2010; Holden, 1996; Milgrom, Negri, Gemmill, McNeil, & Martin, 2005; Misri & Kendrick, 2007; O'Hara, Stuart, Gorman, & Wenzel, 2000; Sokol, Epperseon, & Barber, 2011; Stuart, 2012). For many women,

however, treatment engagement in psychotherapy involves barriers such as stigma, financial barriers, and lack of time, transportation, or childcare (Goodman, 2009). In addition, the logistics of getting to psychotherapy appointments can be overwhelming for a depressed mother of a newborn. Therefore, PPD interventions that are acceptable, such as psychotherapy, and logistically feasible, such as in-home treatment, are indicated to increase treatment uptake, adherence, and efficacy.

Yet even if a woman receives effective PPD treatment, or if the depression resolves spontaneously, the negative effects of depression on dyadic interaction and the mother-infant relationship are likely to remain (Cooper et al., 2003; Forman et al., 2007; Gunlicks & Weissman, 2008; Murray, Cooper, Wilson, & Romaniuk, 2003; O'Hara et al., 2000; Poobalan et al., 2007). Although mothers may feel better, their behavior with their infants may remain compromised. Various intervention approaches have been utilized to enhance the mother-infant relationship in the context of maternal depression. Interventions have focused on increasing maternal sensitivity, responsiveness, and engagement with the infant (Cohen et al., 1999; Cooper et al., 2002; Field et al., 2000; Gelfand, Teti, Seiner, & Jameson, 1996; Jung, Short, Letourneau, & Andrews, 2007; Lyons-Ruth, Connell, Grunebaum, & Botein, 1990); highlighting/enhancing attachment-promoting behaviors when they occur (Cicchetti, Rogosch, & Toth, 2000; Clark et al., 2008; Clark, Tluczek, & Wenzel, 2003; Cohen et al., 1999; Gelfand et al., 1996; Niccols, 2008); helping the mother develop insight into the effects of her previous relationships on her current feelings and relationship with her infant (Cicchetti et al., 2000; Lyons-Ruth et al., 1990); providing interaction coaching (Field et al., 2000; Horowitz et al., 2001; Malphurs et al., 1998); promoting the frequency of touching via infant massage or other sensitive touching (Milgrom, 1994; van Doesum, Riksen-Walraven, Hosman, & Hoefnagels, 2008); increasing social support (Milgrom, 1994; van Doesum, et al., 2008); and providing support, reassurance and psychoeducation to the mother (Cooper et al., 2002; Gelfand et al., 1996; Lyons-Ruth et al., 1990). Although many of these interventions greatly ameliorated the negative consequences of maternal depression on the developing child, maternal depressive symptoms often remained high (Nylen, Moran, Franklin, & O'Hara, 2006).

Thus, there is a great need for interventions to target both PPD and mother-infant relationship dysfunction. Cramer (1993) has suggested that PPD "is best conceptualized as a disruption in the mother-infant relationship" (p. 283) while Nylen et al. (2006) proposes the most efficacious treatment approaches address the needs of the mother, the infant, and their relationship. Only a paucity of studies with small samples have tested interventions specific to both maternal depression and the mother-infant relationship (Clark et al., 2008; Field et al., 2000; Milgrom et al., 2005; Milgrom et al., 2006).

Because maternal depression and mother-infant relationship dysfunction are linked and have reciprocal effects on each other, an integrated approach that addresses both problems simultaneously might lead to synergistic effects. We therefore developed a dyadic psychotherapy intervention to address maternal PPD and the mother-infant relationship. The purpose of the present study was to determine the feasibility, acceptability, and preliminary efficacy of a new intervention, Perinatal Dyadic Psychotherapy (PDP), for the early treatment of maternal PPD. Specific objectives were to:

1. Evaluate the capability to train bachelor-level nurses without previous mental health experience to deliver the intervention and maintain intervention fidelity over time;
2. Assess the feasibility and acceptability of the recruitment strategy, intervention, and study protocol in a sample of clinically depressed postpartum women.
3. Assess the preliminary efficacy of the intervention on reduction of maternal depression and anxiety and improvement of maternal self-esteem at post-intervention and follow-up.

Materials and Methods

The Perinatal Dyadic Psychotherapy Intervention

Conceptual and Clinical Framework—The framework of the PDP intervention is grounded in the Mutual Regulation Model of Mother-Infant Interaction (Tronick, 2007), which conceptualizes child psychological development as an interactive or relational process in which mothers and infants are active participants in a mutually regulated interaction. When infants send emotional signals that are accurately interpreted by mothers, mothers can help infants regulate their emotions and reduce their negative arousal, contributing to healthy emotional development. Maternal depression, however, can disrupt this mutual regulatory process by compromising maternal affective responsiveness, limiting the degree of “active engagement” infants experience with their mothers (p. 53; Weinberg & Tronick, 1998).

The PDP intervention integrates the clinical strategies of supportive psychotherapy (Winston, Rosenthal, & Pinsker, 2004), parent-infant psychotherapy (Lieberman, Silverman, & Pawl, 2000), and the Touchpoints™ Model of Child Development (Brazelton & Sparrow, 2006). These strategies share many elements, while each introduces and emphasizes specific features relevant to the mothers’ emotional well-being, mothering an infant, and the mother-infant relationship. Supportive psychotherapy (Winston et al., 2004) utilizes a variety of techniques such as active listening, praise, reassurance, encouragement, reframing, expanding the patient’s awareness, and anticipatory guidance to ameliorate psychiatric symptoms, improve functioning, or help bolster an individual’s ability to deal with a crisis or transient problem. The therapeutic relationship is considered key to positive outcome. Supportive psychotherapy has been shown to be an effective therapy for depression in general populations (Cuijpers, Smit, & van Straten, 2007) and in treatment of PPD (Cooper et al., 2003; Cuijpers, Brännmark & van Straten, 2008; Holden, Sagovsky, & Cox, 1989; Wickberg & Hwang, 1996). Mother-infant psychotherapy (Lieberman et al., 2000), which is influenced by relational theories such as attachment theory and psychoanalytic theory, utilizes supportive as well as insight-oriented techniques to enhance maternal emotional adjustment to the infant and improve the mother-infant relationship. A core concept in the therapy is the understanding that the mother’s perceptions of the baby’s personality and behavior can be influenced and distorted by her own past experiences or “ghosts in the nursery” (Fraiberg, Adelson, & Shapiro, 1975). The therapy aims to align a mother’s perceptions and resulting caregiving behaviors with her baby’s individual needs and

development. The therapeutic relationship provides a safe holding environment in which the new mother feels encouraged, validated, and psychologically supported to grow in self-knowledge and understanding of her child. The baby's presence in the therapy session is vital as it allows for therapeutic intervention "in the immediacy of the moment, while affect is being keenly experienced and can be addressed directly" (p. 473; Lieberman et al., 2000).

The Touchpoints™ Model of Child Development (Brazelton & Sparrow, 2006) is a preventive, strengths-based model in which the infant's behavior is seen as a powerful means of communication and is used to increase maternal understanding of and sensitive responsiveness to her infant and to promote overall maternal emotional availability. The model provides a practical method for strengthening parent-child relationships and is integrated throughout the PDP intervention as the key orientation of the developmentally-based, infant-oriented component of the intervention. As the mother and nurse share observations and discovery of infant behaviors and mother-infant interactions, the co-construction of the meanings of her infant's behavior increases a mother's understanding of her child, enhancing maternal emotional availability, and promoting maternal sense of competence. Anticipatory guidance regarding predictable developmental crises helps a mother to see them as positive signs of her infant's healthy development, further increasing maternal emotional availability and responsiveness to the infant. The approach also helps minimize parenting stress and encourages mothers to increase their social support, both of which are relevant to postpartum depression risk. The Newborn Behavioral Observation (NBO; Nugent, Keefer, Minear, Johnson, & Blanchard, 2007), which is based in the Touchpoints™ model, is a specific tool designed to help clinicians sensitize parents to their infant's behavioral and emotional competencies and uniqueness in order to promote positive parent-infant interactions and the early development of a positive parent-infant relationship. The theoretical framework of NBO proposes the following, (a) parents who understand their child's behavior and development will have more confidence in their ability to meet their child's needs, and (b) parents' increased awareness of the infant's developmental and interactive capabilities may enhance parental sensitive responsiveness which in turn may improve parent-infant interactions. Studies have documented the positive effects of NBO-type interventions on various parenting and child developmental outcomes (Brazelton & Nugent, 1995; Cooper et al., 2009; Nugent & Brazelton, 1989).

Intervention Description—The Perinatal Dyadic Psychotherapy intervention for PPD consists of eight sessions delivered over three months. The intervention is delivered by maternal-child nurses trained in the intervention, and is conducted in the participants' homes. Home-based, nurse-delivered interventions have been especially effective in improving various maternal and child outcomes (Kearney, York, & Deatrick, 2000; Olds et al., 2002; Olds et al., 2004; Olds, Sadler, & Kitzman, 2007). In-home observations provide important information regarding both environmental assets and challenges, are highly acceptable to postpartum women, and improve intervention access and retention by decreasing barriers that may interfere with participation, such as transportation, care for older siblings, and difficulties that mothers of young children often experience in getting out of the house (Cooper & Murray, 1997). Due to the focus on fostering the mother-infant relationship, only mothers and infants were included in the intervention; however the

intervention includes a focus on couples' adaptation and negotiation of new roles/responsibilities.

The overall goals of the PDP intervention are to promote maternal mental health and to facilitate optimal mother-infant relationships. The major components include: (a) a supportive, relationship-based, mother-infant psychotherapeutic component, and (b) a developmentally-based infant-oriented component designed to enhance maternal sensitive responsiveness and promote positive mother-infant interactions. There are three major areas of focus: (1) maternal emotional well-being, functioning, and adjustment to motherhood, (2) infant behavior and development (getting to know the infant), and (3) the mother-infant relationship. Specific intervention strategies for each focus area are outlined in Table 1.

The PDP intervention utilizes a strengths-based approach and the nurse-mother relationship is collaborative and non-hierarchical. In the mother-infant psychotherapeutic component of the intervention, the relationship between the nurse and mother is the major therapeutic tool, creating a safe space for a mother to reveal her concerns and uncertainties about parenting. The nurse provides a positive supportive emotional environment for the mother and fosters what Stern (1995) refers to as the positive transference of the therapist as the "good mother." Using supportive psychotherapy techniques such as reflective listening, validation, reassurance, and encouragement, the nurse nurtures and contains, all the while encouraging maternal growth and self-sufficiency (Misch, 2000). This positive, nurturing, nonjudgmental relationship gradually becomes incorporated into the mother's own internal representation of herself as a mother (Nugent et al., 2007) and helps her to optimize her response to the infant's demands. The infant's presence in the therapy session is a central part of the therapy. Together, the nurse and mother observe the infant's behavior and explore the meaning the mother attributes to it, helping her to rework distorted perceptions of the infant or of herself as a mother by considering what she might be bringing from her own childhood, which may interfere with her sensitivity to her infant, and then, considering the infant's perspective using guidelines from Lieberman and colleagues (Lieberman et al., 2000). The nurse supports the mother's knowledge of her infant and the unique relationship she has with her infant.

The developmentally-based infant-oriented component provides mothers with a nurturing and supportive context in which to get to know their new baby. This component consists of administration of the 18-item Newborn Behavioral Observation (NBO; Nugent et al., 2007) used to assess the infant's (1) capacity to habituate to light and sound stimuli (sleep protection), (2) quality of motor tone and activity level, (3) capacity for self-regulation, including crying and consolability, (4) response to stress and threshold for stimulation, and (5) visual, auditory and social-interactive capacities. The NBO is administered in full within the first two home visits and then portions of it may be administered at subsequent visits with the focus varying according to the infant's state, the mother's interests/questions, and the age and developmental stage of the infant. Mothers are invited to administer parts of the NBO themselves to promote their active involvement. Mothers' observations and interpretations of the infant's behavior are elicited and the nurse encourages her to explore the adaptive capacities of her infant and the kinds of caregiving that could best soothe her infant. The nurse encourages the mother to discuss any questions, concerns, or related

issues, and provides anticipatory guidance regarding predictable developmental crises based on the Touchpoints™ model of child development. The focus of each intervention session is adapted to the individual mother-infant dyad in response to the mother's concerns, questions, mood, and to what's going on with the baby during the session. There is no systematic order of steps and the focus may shift rapidly and repeatedly.

Procedures

Intervention development—During the protocol development phase, a comprehensive intervention manual was developed using expert consultation from clinicians, researchers, and consultants with expertise in child development, psychotherapy for PPD, and parent-infant psychotherapy. The intervention was then pilot-tested by the principal investigator with three non-depressed mothers. Participant feedback was elicited via brief interviews at the end of the intervention and the intervention was further refined and a comprehensive training program for nurse interventionists was developed.

Interventionist training—The PDP intervention is delivered by bachelors-level registered nurses and not mental health clinicians. This unique feature minimizes cost and increases the potential for widespread dissemination if the intervention is effective. Two bachelor-level registered nurses with experience in maternal-child nursing were trained to deliver the intervention. These individuals were members of the team who were engaged to participate in the subsequent randomized clinical trial of this treatment. The 10-day training included: (1) attendance at a 3-day individual-level Touchpoints™ training program, (2) attendance at a 1-day NBO training, (3) participation in 6 days of structured training regarding the study intervention which included didactic content regarding PPD, the effects of PPD on infants, and the theoretical underpinnings of the study; specific training in establishing a therapeutic alliance and in utilizing supportive and mother-infant psychotherapy techniques; comprehensive review of the intervention manual; video observation of the intervention conducted by the principal investigator (PI); and videotaped role-play and individualized feedback. The training was conducted by the PI with assistance of study consultants and specified training programs.

Interventionist supervision—The PI provided close supervision of nurse interventionists through review of videotaped intervention sessions with specific feedback to nurses, and weekly team meetings centered on case discussion and maintenance of intervention fidelity. The PI was also available for nurse interventionist consultation and case support throughout the study.

Sample recruitment—First-time, English-speaking mothers of healthy singleton newborns were recruited from the hospital postpartum units of a large academic teaching hospital and screened for initial study eligibility at one month postpartum by mailed questionnaire. Eligible participants were those who scored ≥ 10 on the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987), were not currently receiving any depression treatment, had no or low suicide risk at screening as determined by EPDS question 10 and follow-up on any positive score, and were at least 18 years of age. Eligible mothers were administered the mood and anxiety disorders modules of the Structured

Clinical Interview for the DSM-IV Axis I Disorders Non-patient Version (SCID-I; First, Spitzer, Gibbon, & Williams, 2002) at approximately 5–6 weeks postpartum by a research assistant via home visit for final eligibility evaluation. Mothers who met criteria for current Major Depressive Disorder (MDD) were included. Mothers with bipolar disorder and/or past or current psychotic disorder were excluded and were given a resource list of mental health providers and depression hotlines. The resource list was also given to all mothers who scored ≥ 20 on the EPDS and to any woman who requested depression help information. Study participants were enrolled between June 2010 and April 2011. Recruitment for this non-randomized pilot study included only women who met criteria for clinical depression. It took place in conjunction with initial recruitment for a larger randomized controlled study to test the same intervention in postpartum women with subclinical levels of depressive symptoms.

Intervention delivery—Nurse interventionists delivered the PDP intervention to mother-infant dyads in their homes for the series of eight interventions home visits over three months. Visits took place weekly for the first four visits then every other week for the remaining four visits. Each intervention visit lasted approximately one hour and was videotaped.

Assessments and Measures—To assess the feasibility of training bachelor-level registered nurses without previous mental health experience to deliver the PDP intervention and to maintain intervention fidelity over time, we assessed the competency of each nurse in meeting predefined criteria for intervention adherence at the completion of the intervention training period by using role play scenarios.

To assess treatment fidelity during the study, an intervention fidelity coding manual and form were developed based on the PDP intervention manual. Two graduate nursing students were hired as fidelity coders and received intensive training from the PI regarding the intervention components and fidelity assessment. They each achieved an inter-rater reliability score of at least 90% in practice coding before independent coding of study videos. All intervention sessions were videotaped then three sessions for each participant were randomly selected for coding: one from sessions 1 to 3, one from sessions 4 or 5, and one from sessions 6 to 8. Selected sessions were transcribed and coded for both adherence to intervention protocol and competence in providing intervention elements. Total fidelity and competence scores for each session were calculated and an average score for each participant was calculated based on the participant's three coded sessions.

To assess participant recruitment we recorded the number of potential participants approached, the proportion meeting eligibility criteria, and the proportion refusing participation, with reasons for refusal noted. Nurse interventionists recorded participation/adherence rates. The depression symptom rating scale (EPDS) was completed at baseline, at every intervention session, at post-intervention, and at follow-up.

Outcome assessors collected all baseline and outcome data. Although this was an open-label clinical trial, our outcome assessors were also collecting data for a larger randomized controlled study of the same intervention which included women with subclinical

depression. Thus, outcome assessors were blind to depression status (e.g., EPDS scores, depression diagnoses) and to whether participant was receiving the study intervention or not. Outcome data collected at baseline, post-intervention, and follow-up included psychiatric diagnoses (i.e., depressive disorders and anxiety disorders), depression symptom level, anxiety symptoms level, and maternal self-esteem scores. Mother-infant interaction, parenting stress, and infant socio-emotional data were also collected at post-intervention and follow-up time points as part of determining procedure feasibility; however, these data were not analyzed in this pilot study. All study measures have good psychometric data regarding reliability and validity. Internal consistency of the scores for the instruments used to assess depression symptom level, anxiety symptom level, and maternal self-esteem, was assessed with Cronbach's alpha. Results indicated the scales achieved acceptable levels for research purposes for all three waves. Results are presented in Table 2.

Depression and anxiety diagnoses. The mood and anxiety modules of the Structured Clinical Interview for DSM-IV Axis I Disorders, Non-Patient Edition (SCID-I/NP; First et al., 2002) were used to determine psychiatric diagnoses. The SCID-I/NP is a semi-structured diagnostic interview widely used in psychiatric research studies.

Depression severity. The Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987) is a 10-item self-report measure designed to assess presence and severity of PPD symptoms. It has adequate sensitivity and specificity when compared to psychiatric diagnoses of major and minor depression and is sensitive to changes in depression over time. It was used to determine study eligibility, measure level of depressive symptoms, and monitor for clinical deterioration throughout the study.

Maternal anxiety. The State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970) is a widely-used self-report questionnaire consisting of two 20-item subscales. The State subscale measures transient/current anxiety and is sensitive to changes over time and was used for this study.

Maternal self-esteem. The Maternal Self-Report Inventory (MSRI; Shea & Tronick, 1988) provides a global score compiled of seven dimensions of maternal self-esteem: caretaking ability, general preparedness for mothering role, acceptance of baby, expected relationship with baby, complications during labor and delivery, parental influence, and body image and maternal health. The full MSRI was administered at baseline. An abbreviated version was administered at post-intervention and follow-up time points.

In addition, the following outcome data were collected at post-intervention and follow-up to assess feasibility and acceptability of study protocol in collecting this data. These outcomes were not assessed in this study:

Parenting Stress. The Parenting Stress Index-Short Form (PSI-SF; Abidin, 1995) is a 36-item measure developed to identify potentially dysfunctional parent-child relationships, which places a child at risk for emotional disturbance, and to measure the relative magnitude of stress in the relationship.

Mother-Infant Interaction. Mothers-infant dyads were videotaped in a 5-minute free-play session for later analysis of dyadic interaction.

Infant Social Emotional Development. Data regarding the infant's capacity to deal with stress and to self-regulate was collected by videotaping mother and infant during the Still Face Procedure (SFP; Tronick, Als, Adamson, Wise, & Brazelton, 1978). The SFP is an interactive social stressor utilized extensively to assess regulatory capacities of infants in the context of variations in maternal behavior. Results of the SFP at six months have been correlated with attachment at age one year (Mesman, van IJzendoorn, & BakermansKranenburg, 2009).

Safety Considerations—Depression symptom levels of mothers were monitored using the EPDS at all intervention home visits and data-collection visits. Protocol was in place so that if a participant scored ≥ 20 on the EPDS or indicated suicidal ideation per self-report or a positive score on EPDS question 10, the research nurse or RA would follow a suicide risk assessment protocol which included assisting the participant to obtain appropriate mental health care, including emergency room evaluation for psychiatric admission if indicated. Participants received compensation of \$200 for completion of the entire intervention and study protocol, with compensation prorated for the participant who did not complete all intervention visits. All study procedures were approved by the Institutional Review Boards for Human Subjects Research at the participating hospital recruitment site and academic center.

Results

Feasibility of Intervention and Study Procedures

Nurse interventionist training, intervention delivery, and fidelity—Two bachelor-level registered nurses were successfully trained in the intervention and met criteria for reliably providing the intervention based on video-taped role play and attainment of at least 90% on interventionist skills checklist at the end of the training. Of the 16 sessions randomly selected for coding, all met intervention fidelity criteria minimum of at least 85% adherence and 85% competence, most sessions being much higher than minimum. Total adherence scores for the six participants ranged from 87% to 92%, with an average of 89.1%. Total competence scores ranged from 94% to 97.3% with an average of 96%. There were no detectable systematic differences in intervention delivery between interventionists.

Recruitment and sample characteristics—Figure 1 shows the flow of study recruitment. Of the 419 screened, eight were eligible for the study: six enrolled, and two declined: one because she was moving out of state within the next few months, and another because her baby had been recently diagnosed with a significant medical problem and she no longer felt she had time or interest to participate. Participants ranged in age from 25 to 37 years ($M = 32$, $SD 5.02$) and their infants ranged from 5.7 to 8 weeks old at the start of the intervention ($Mean = 6.5$ weeks). Two were single and four married. Two indicated their race as white/Hispanic, two as Caucasian, one as Asian, and one indicated "other." All had at least some college education. Two of the six participants had a history of one or more

previous major depressive episodes. One had onset of depression during pregnancy and five within the first six weeks postpartum.

Adherence and retention—Five of the six participants completed all eight intervention sessions. One participant completed two sessions before returning to work full-time and was unable to schedule intervention visits thereafter. There were no adverse events reported at any time during the study. At the encouragement of the nurse interventionist, two of the mothers decided to seek additional depression treatment during the study. One saw a psychiatrist for one visit at approximately 3.5 months postpartum and was prescribed a light box which she used only twice. She also saw a therapist once at around the same time but chose not to continue with therapy. Another participant saw a mental health counselor for one visit but did not continue. All six participants completed post-intervention and follow-up data collection.

Acceptability of Intervention and Study Procedures

The adherence of five of the six participants to all eight sessions of the 8-session intervention protocol and the completion of all study data collection procedures by all participants attest to the acceptability of both the study intervention and procedures to this population of depressed postpartum women. In post-intervention qualitative evaluation, participants expressed that they found the intervention very helpful and enjoyed having the nurse meet with them regularly to talk about how they were doing, to discuss their infant's development, and to address any questions and concerns they had regarding their baby. Most of the participants reported they looked forward to the intervention sessions and that it helped them just knowing that the nurse was coming. The participant who was unable to complete the eight sessions also reported finding the sessions very helpful and wished she could have had more visits.

Efficacy of the Intervention

Table 3 presents psychiatric outcome data for variables across all time points. By post-intervention all six participants were no longer depressed, and all continued to maintain a non-depressed status at follow-up. Figure 2 displays EPDS scores for all participants over the course of the study. We used a series of one-way repeated measures ANOVAs to assess differences in mean scores of depression, state anxiety, and self-esteem scores across the three time points (baseline, post-intervention, and follow-up). The sphericity assumption of the ANOVA test was checked with the Mauchly's sphericity test for each analysis. In case of the violation of the sphericity assumption, adjustments were made to the ANOVA results using the Geisser-Greenhouse epsilon. Results of the repeated measured ANOVAs showed statistically significant differences among the mean scores for depression, $p = .02$, $\eta^2 = .53$; state anxiety, $p < .01$, $\eta^2 = .66$; and maternal self-esteem, $p = .01$, $\eta^2 = .56$. Follow-up tests using the LSD technique revealed there was a statistically significant decrease in depression and anxiety scores from baseline to post-intervention, both of which were maintained at follow-up with no significant further change from post-intervention to follow-up. There was a significant improvement in maternal self-esteem scores from baseline to post-intervention, which was partially maintained at follow-up, with no other significant differences in MSRI scores. The means and standard deviations are presented in Table 4.

Discussion and conclusion

This paper describes the pilot use of a home-based, nurse-delivered dyadic psychotherapy with acutely depressed postpartum women. Results of this open trial demonstrate the feasibility, acceptability, and safety of the PDP intervention with this population. Although the findings are preliminary and limited, these results suggest the effectiveness of PDP by the novice therapists in attenuating postpartum depression.

The study shows that recruiting and retaining depressed postpartum women into such a trial is feasible, as is training bachelor-level nurses to successfully implement the intervention and maintain intervention fidelity throughout the study. The ability of bachelors-level nurses without mental health specialization to provide the intervention suggests this treatment is relatively easy to learn, could be less expensive than specialist care, and could potentially be disseminated to a broad population via nurse home visiting programs.

Participant attendance, completion and retention rates, and intervention satisfaction provide evidence of the acceptability of both the intervention and study procedures among women with postpartum depression. This is an important finding given the daily responsibilities, multiple environmental stressors, and logistical obstacles that often jeopardize the capacity of mothers of newborns to effectively use structured treatment approaches and complete research study protocols, especially ones requiring participation over such a substantial time period. Participant feedback indicates the PDP is an acceptable intervention that is positively received by depressed mothers of newborns. Because the intervention took place in the mothers' homes at a time that was convenient for them likely enhanced its practicality. All participants completed all data collection points which covered a period from one month to approximately eight months postpartum. Five of the six participants completed all intervention sessions. One participant completed only the first two sessions due to her work schedule, however she communicated she found the sessions helpful and wished she could have continued. Despite the home-based nature of the intervention and the flexibility in scheduling sessions at a time convenient for the mother, working mothers may, nevertheless find treatment participation difficult or prohibitive. Thus, feasible interventions for mothers who are employed full-time out of the home, need to be specifically developed.

The preliminary evidence of this PDP intervention in reducing maternal depression as theorized was supported. Participants demonstrated a rapid rate of response to treatment as shown by decreases in depression scores early in treatment. All six participants achieved clinically significant change as evidenced by remission of depression along with significant reduction in depression symptoms levels. Although the intervention did not specifically target anxiety, anxiety frequently co-occurs with postpartum depression (Britton, 2007; Reck et al., 2008; Ross & McLean, 2006). Thus, the substantial decrease in anxiety symptom levels among participants from baseline to post-intervention is encouraging. The positive change in maternal self-esteem is similarly promising, suggesting the emphasis of the intervention on a mother's parenting strengths and capacity to meet her infant's needs appears to be effective.

The longitudinal nature of the study and the systematic collection of depression scores over multiple time points provide important information regarding the variability of EPDS scores on a weekly or every other week basis. This raises important questions regarding the accuracy of screening for PPD at any single point in time, and suggests the need for multiple screenings to be more effective in weeding out transitory mood disturbance from more sustained depressive symptoms indicative of a clinical depression that may require intervention. Given the current emphasis on PPD screening in various healthcare settings (ACOG Committee on Obstetric Practice, 2010; Earls, 2010), it is important to develop effective as well as efficient screening programs to make good use of presumably limited healthcare resources.

Given the negative effects of maternal depression on both mothers and infants, it is imperative PPD be identified and treated. Early intervention in PPD is important because the onset of PPD occurs within the first 6 weeks postpartum for most women (Stowe, Hostetter, & Newport, 2005) and if the depression continues beyond 6 months postpartum, there is a significant increase in the negative effects for infants (Field, 1995). To prevent mental health and developmental problems in children, it is imperative that psychopathology in parents be targeted. In addition, interventions which target the mother-infant relationship can provide a protective factor for child development and prevent a cycle of mutually unsatisfactory encounters. As noted earlier, many women are reluctant to take medication during the postpartum period and prefer non-pharmacologic interventions, especially if breastfeeding. The importance of available, acceptable and effective non-pharmacologic interventions to treat maternal depression is critically important, as is the development of interventions to target the mother-infant relationship and infant developmental outcomes.

The preliminary results indicate that the PDP intervention succeeds at delivering a unique combination of treatment components aimed at treating maternal depression and the mother-infant relationship within a dyadic format. Although the results suggest that the intervention may decrease PPD, larger randomized controlled trials are needed to determine the effectiveness of the intervention on maternal, child, and relationship outcomes. The participants in this study were women who were not identified by the healthcare system and were not seeking treatment for themselves. Nevertheless, they were clinically depressed and expressed substantial difficulty with mood, functioning, and adjustment to motherhood. Identification and subsequent treatment for these women and those like them should be a priority. The results of this study indicate, however, that identifying clinically depressed women by community sample screening is labor intensive. Developing efficient yet effective population-level screening procedures to identify women with PPD are needed.

The results of this pilot study are limited by the small sample size, inadequate power, and the absence of a comparison or control group and are therefore only preliminary. We cannot disregard the possibility that remission of PPD and decrease in depressive symptoms were a result of the passage of time. Participants may have spontaneously felt better as they adjusted to the physical and emotional demands of new motherhood and as infants may have become more settled. The findings do suggest, however, that a brief nurse-delivered, home-based dyadic psychotherapy can improve depressive symptomatology, anxiety, and maternal self-esteem in depressed postpartum women. Although our preliminary results are

promising, they await future investigation with adequately powered, double-blind, controlled studies comparing the efficacy of our protocol with appropriate control conditions (e.g. placebo, minimal attention, alternative psychosocial treatment, and psychopharmacological intervention). Additionally, longer-term follow-up of treatment outcome is necessary to ascertain whether our acute treatment gains endure past the 3-month follow-up period and, accordingly, if modifications in our treatment protocol are warranted. Due to the lack of a control or comparison group, this pilot study did not analyze dyadic or child outcomes (e.g., mother-infant interaction, infant social emotional development), however we were able to demonstrate that collecting such videotaped mother-infant interaction data and other outcome data was feasible in this population, and future studies will analyze these important outcomes. Results suggest that the PDP warrants further investigation as treatment for PPD.

Acknowledgments

Support for this study was provided by grants to J. Goodman from the Robert Wood Johnson Foundation and from the National Institute of Child Health and Development (1R21HD065156-01). We wish to acknowledge the valuable contributions of our research team: Jennifer Bernard, Laura Betz, Melissa Burnett Kayse Eichelberger, Mary Ellen Flanagan, Avery Forget, Christine Godbout, Carol Gordon, Deborah Koopman, Stephanie Lubin-Levy, Rachael Phillips, and Gabrielle Santangelo.

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Figure 1.
Flow of study recruitment

Figure 2.
EPDS scores over time

Table 1**Specific Intervention Strategies**

FOCUS ON MOTHER'S EMOTIONAL WELL-BEING, FUNCTIONING, AND ADAPTATION TO MOTHERING
Monitors maternal mood with administration of EPDS and direct inquiry
Fosters exploration of maternal feelings
Makes comments that promote maternal self-competence and self-esteem
Focuses on mother's functioning (sleep, nutrition, task accomplishment, work plans if appropriate)
Focuses on increasing mother's support system
Encourages mother to make time for pleasant and self-nurturing activities (fun, exercise, getting out, getting breaks, etc...)
Explores what becoming/being a mother means to her
Reassures/normalizes mother's experience/feelings/etc.
Focuses on couple's adaptation and negotiation on new roles/responsibilities
Engages mother in search for an effective solution to problems as appropriate
Helps mother recognize and modify unhelpful thinking
Attends to both the baby's objective behavior and the mother's interpretation and reaction to her baby's behavior
Helps mother consider the infant's perspective
Encourages mother to reflect upon her own experiences of being parented to gain insights about the template that they bring to being a mother
FOCUS ON INFANT'S BEHAVIOR AND DEVELOPMENT
Engages mother in discussion of child's development (general development)
Recognizes/comments on infant's behavior and developmental progress and/or strengths of baby
Promotes discussion of parenting issues
Frames infant's behavior as the infant's "language" or "communication" and engages mother in observing and wondering about infant's cues or behaviors, competencies and vulnerabilities, adaptation to the environment, and threshold for stimulation
Elicits mother's perception of child's temperament
Offers unstructured developmental and anticipatory guidance
Performs Newborn Behavioral Observation (NBO) at visits 1 and/or 2 and at additional sessions as appropriate
Listens for and identifies maternal attributions of child and modify mother's unrealistic representations of her baby
FOCUS ON THE MOTHER-INFANT RELATIONSHIP
Inquires directly about or explores the mother-infant relationship
Encourage developmentally appropriate interaction and play between mother and baby in session and on own
Uses direct observations of mother-infant interaction to recognize and positively reinforce maternal interactive behaviors that are appropriate and positive
Uses direct observations of mother-infant interaction to highlight the infant's developing social responsiveness to mother
Discusses and encourages mother's sensitivity to infant's needs/cues
Emphasizes mother as expert on her child
Encourages mother to take pleasure in her accomplishments as a mother
Recognizes and comments on strengths of the mother and baby relationship

Table 2

Cronbach's alpha.

Instrument	Baseline	Post-Intervention	Follow-Up
EPDS	.76	.82	.84
STAI (State)	.73	.90	.84
MSRI	.96	.92	.96

Table 3

Psychiatric outcome across time points

Participant	Screening EPDS	History of MDE	Past and/or Current Anxiety Diagnoses per SCID-IV at Baseline	Baseline EPDS	Post-Intervention EPDS	SCID-IV Results at Post-Intervention	Follow-Up EPDS	SCID-IV Results at Follow-Up
1	14	Yes - 1 prior MDE	PTSD (past)	17	9	No	6	No
2	15	No	Specific phobia (flying)	20	1	Specific phobia (flying)	2	Specific phobia (flying)
3	19	No	OCD (past and current)	14	0	No	2	No
4	13	No (but MDE onset during pregnancy)	No	13	9	No	2	No
5	11	Yes - 2 prior MDE episodes	No	11	4	No	4	No
6	14	No	Social phobia (current)	12	9	Social phobia (current)	9	Social phobia (current)

EPDS = Edinburgh Postnatal Depression Scale; MDE = major depressive episode; SCID-IV = Structured Clinical Interview for DSM-IV; PTSD = Post-traumatic stress disorder; OCD = obsessive compulsive disorder;

TABLE 4

Mean scores at baseline, post-intervention, and follow-up (mean/standard deviation)

Measure	Baseline	Post-Intervention	Follow-Up
EPDS	14.5 (3.391)	5.5 (4.416)	6.33 (5.955)
State Anxiety	44.67 (6.218)	30.17 (7.859)	29.17 (7.305)
Maternal Self-Esteem	362.3 (49.714)	319.8 (28.224)	332.0 (42.043)