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PTSD in Depressed Mothers in Home Visitation

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Abstract

Recent research has suggested that mothers participating in home visitation programs have a high incidence of mental health problems, particularly depression. Posttraumatic stress disorder (PTSD) is a common comorbidity with depression, yet its prevalence among home visiting populations and implications for parenting and maternal functioning have not been examined. This study contrasted depressed mothers with ($n = 35$) and without PTSD ($n = 55$) who were enrolled in a home visitation program. Results indicated that depressed mothers with comorbid PTSD were more likely to have experienced childhood sexual abuse, had greater severity of depressive symptoms, increased social isolation, and lower overall functioning than their counterparts without PTSD. Among PTSD mothers, greater severity of PTSD symptoms, in particular avoidance and emotional numbness, were associated with increased maternal psychopathology and parenting deficits even after controlling for depression severity. These findings add to the literature documenting the negative impacts of PTSD on maternal functioning and parenting. Implications for screening and treatment in the context of home visitation are discussed.

Keywords

PTSD; depression; home visitation; parenting

Posttraumatic stress disorder (PTSD) is an impairing condition that can emerge following exposure to a traumatic event (Friedman, Keane, & Resick, 2007). PTSD comprises symptoms organized into three clusters: reexperiencing the trauma, avoidance, and increased physiologic arousal. Left untreated, PTSD can have a chronic and debilitating course. The National Comorbidity Survey Replication (Kessler, Berglund, Demler, Jin, & Walters, 2005)

found a lifetime prevalence rate for PTSD of 6.8%. Studies have repeatedly demonstrated that women have prevalence rates that are up to two times higher than men (Breslau, 2009), primarily due to the higher rate of sexual assault experienced by women. Risk factors most frequently associated with PTSD are being female, history of affective disorders, childhood adversity, poverty, and family history of substance use disorders or other psychopathology (Bromet, Sonnega, & Kessler, 1998). PTSD and Major Depressive Disorder (MDD) are highly comorbid, with up to 50% of women with PTSD also having concurrent MDD (e.g., Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995).

Recently, increased attention has focused on the prevalence and associated clinical features of PTSD and its symptoms in pregnant and perinatal mothers. For example, Smith, Poschman, Cavaleri, Howell, and Yonkers (2006) examined PTSD in a community sample of low income pregnant women recruited from obstetrics clinics. Results indicated that 29.3% of women reported a lifetime exposure to trauma, and 11.9% of these mothers met criteria for PTSD. Comorbidity with depression was high (66.7%), and risk factors most predictive of PTSD included current depression, current panic disorder, current suicidality, and serious physical attack or assault. Loveland Cook et al. (2004) found a PTSD prevalence rate of 7.7% in a sample of 744 pregnant women who were Medicaid-eligible. Those with PTSD were 5 times more likely to have current major depression than their counterparts without PTSD. Additional predictors included experiencing multiple traumatic events, a finding that has been documented in other studies of PTSD in mothers (Onoye, Goebert, Morland, Matsu, & Wright, 2009). PTSD during pregnancy is also associated with increased risk for pregnancy complications and health problems (Morland et al., 2007; Yehuda, 2002).

Several common themes emerge from the small but growing literature on PTSD during pregnancy and perinatally. First, prevalence rates are equal to or exceed that found in populations of women who are not parents. Second, there is high comorbidity with depression. Several studies suggest that concurrent presentations of PTSD and depression impart increased overall symptom severity and functional impairment (Oquendo et al., 2003). And third, PTSD in new mothers is often associated with the experience of multiple traumatic events, often beginning in childhood and involving interpersonal violence and sexual abuse. Manifestation of PTSD in this population is likely to be consistent with the complex trauma presentation (Briere, Kaltman, & Green, 2008), which in turn is characterized by disruptions in early developmental processes that contribute to maladjustment through adulthood and can impact the parenting role. Each of these features can be detrimental to mothers as they take on the challenges and responsibilities of raising the newborn child, particularly when they occur in the context of concurrent MDD.

MDD and Parenting

MDD can have profound negative impacts on parenting and child adjustment. When compared with mothers without MDD, depressed mothers are more disengaged from their children (Radke-Yarrow, Nottelmann, Belmont, & Welsh, 1993), less sensitive to child cues and emotional states (Field, 2002), more negative and less positive during interactions (Pelaez, Field, Pickens, & Hart, 2008), less able to regulate affect or behavior during interactions with their children (Field et al., 2007), and talk less to their children (The NICHD Early Child Care Research Network, 2005). Additionally, depressed mothers are less likely to engage in functional and symbolic play (Bigatti, Cronan, & Anaya, 2001), read less frequently to their children (Kavanaugh et al., 2006), and are less attentive to health and prevention requirements (Minkovitz et al., 2005). These deficits in parenting have been observed even when depressive episodes lift and mothers are minimally symptomatic (Seifer, Dickstein, Sameroff, Magee, & Hayden, 2001). Furthermore, offspring of mothers with MDD have been shown to exhibit numerous developmental and adjustment problems,

including insecure attachment, delays in cognitive development, and emotional and behavioral dysregulation (National Research Council and Institute of Medicine, 2009).

Trauma, PTSD and Parenting

Parenting comprises an array of beliefs and behaviors that are manifested in raising children. Several theoretical formulations have articulated how traumatic experiences generally, and PTSD in particular, can impact subsequent parenting. Social learning theory proposes that the experiences of abuse in childhood lead to impaired parenting behaviors and beliefs that contribute to inter-generational transmission of maltreatment. Developmental psychopathology perspectives posit that early experiences of trauma contribute to the development of maladaptive coping strategies that are maintained in adulthood and lead to impairments in emotional and behavioral regulation, and distorted views of self and others. These pathways are further modified by contextual influences that alter risk for negative outcomes, including poverty, family and community violence, and substance abuse. PTSD is a potential outcome of these processes, and can interfere with nurturing parenting behaviors (Cohen, Hien, & Batchelder, 2008).

Relatively few studies have examined the relationship between PTSD and parenting, although a larger body of work focuses on the relationship between childhood trauma in mothers (particularly sexual abuse) and later parenting of one's own children. Synthesizing results from this research is complicated by the wide variability in measurement and design among studies, including different definitions of trauma, lack of or inconsistency in measures of PTSD and PTSD symptoms, narrow focus on circumscribed aspects of parenting, and inclusion of wide age ranges of children. Taking into account these limitations, associations between trauma and parenting problems have been documented in the areas of parenting satisfaction (Banyard, Williams, & Siegel, 2003), use of harsh physical punishment (Cohen et al., 2008), and sensitivity to emotional cues (Gibb, Schofield, & Coles, 2009). Barrett (2010) found that mothers who experienced sexual abuse in childhood displayed less parental warmth in their relationships with their own children, a path mediated by depression. In a series of observational studies, Lyons-Ruth and colleagues studied high risk mothers and infants and found that maternal childhood abuse severity predicted infant disorganization (Lyons-Ruth, Yellin, Melnick, & Atwood, 2003). Abuse severity, however, was further predictive of the Hostile/Hopeless state of mind from the Adult Attachment Interview, which in turn was linked to disorganized attachment among offspring. The contribution of the Hostile/Hopeless dimension to disorganized attachment became more prominent at 18 months as the infants were transitioning into toddler-hood. Moreover, disrupted maternal–infant affective communication mediated the relationship between the Hostile/Hopeless classification and disorganized attachment in offspring (Lyons-Ruth, Yellin, Melnick, & Atwood, 2005).

There is small but consistent literature highlighting the impairing consequences of emotional numbing and avoidance, a key symptom cluster of PTSD. Ruscio, Weathers, King, and King (2002) reported on parenting in 66 male war veterans who were exposed to trauma. Emotional numbing and avoidance in fathers was most strongly associated with decreased relationship satisfaction and poorer relationship quality with offspring. This association remained even when controlling for depression, substance abuse, and trauma features. Samper, Taft, King, and King (2004) replicated these findings with a larger sample of male veterans and controlled for additional clinical features.

Although these studies have limited generalizability to new mothers, qualitative research underscores the importance of emotional numbing and avoidance in this group as well. Muzik, Cameron, Fezzy, and Rosenblum (2009) described emotional numbing and

avoidance as a common theme emerging from a qualitative study of new mothers who had experienced trauma and had PTSD. For example, these mothers coped with trauma memories by stating “I don’t want to think about it” (p. 30). They typically denied that the trauma had any negative effects, attempted to distract themselves from thinking about difficult feelings or memories, and expressed reluctance to talk about what had happened to them. Emotional numbing and avoidance may impinge on establishing a close bond with children, redirects coping strategies away from problem solving and toward emotion-focused management, and undermines efforts to provide a nurturing environment for children.

Trauma and Depression in Mothers in Home Visitation

Home visitation has emerged as a promising prevention approach for mothers at high risk for adverse parenting outcomes and their children. Originally targeting prevention of child abuse and neglect, home visitation has expanded its focus to optimizing child development and maternal life course through education, training, and case management. Home visitation typically targets young mothers with sociodemographic risks (e.g., low income), and home visitors provide services and implement curricula in the home setting starting before or shortly after birth and extending through the first years of life. There has been a considerable investment in home visitation as reflected by the fact that such programs are found in at least 40 states and serve up to 500,000 children (Astuto & Allen, 2009).

Mental health issues are only secondarily addressed in home visitation. Yet, there is a growing literature indicating that a significant proportion of mothers in such programs suffer from trauma and depression. In a review of maternal depression in home visitation, Ammerman, Putnam, Bosse, Teeters, and Van Ginkel (2010) concluded that rates of clinically significant depression ranged from 28.5– 61.0%. A sizable number exhibit persistent depression over time, interfering with effective and nurturing parenting and diminishing the benefits of home visitation services. Although no studies have examined PTSD in this population, the high rates of trauma reported by mothers in home visitation suggest increased risk for the disorder. For example, Ammerman et al. (2009) found that 74.1% of mothers in home visitation experienced some form of interpersonal trauma prior to enrollment (physical abuse, sexual abuse, violent crime, intimate partner violence). Of these, two thirds reported having experienced two or more types of trauma. Furthermore, trauma history emerged as a significant predictor of a stable or worsening course of depressive symptoms over the first of year of service.

Identifying the impacts of mental health problems, including depression and PTSD, in mothers participating in home visitation is important for two reasons. First, home visitation provides a unique portal through which mothers can be identified and treated. Mothers in home visitation infrequently receive mental health treatment (Ammerman et al., 2009), and reaching them in a non-traditional setting provides access to a population that would otherwise not receive help. Second, most home visitation programs target young mothers and those having their first child, thus providing an opportunity to intervene in the earliest stages of parenting before patterns and practices become crystallized and resistant to change. Treating mothers who have depression and PTSD at this stage of life increase the potential to alter child trajectories and reduce the risks of offspring in developing subsequent emotional and behavioral problems.

Overview of Study

The purpose of this study was to describe the prevalence and features of PTSD in a sample of mothers with MDD and who were participating in a home visitation program, and determine the additive contribution of PTSD to maternal functioning (depression, general

psychopathology, social support) and parenting (home environment, parenting stress, child adjustment). Participants were primarily first-time mothers enrolled prenatally or shortly after the baby's birth, and they were recruited early in their participation in home visitation when they were 3 months postpartum. MDD was identified using a self-report screen (Edinburgh Perinatal Depression Scale) and a subsequent semistructured diagnostic interview (SCID). Presence of PTSD was determined using a two-step process comprised of meeting criteria for the disorder using the SCID and exceeding the clinical cutoff on the Davidson Trauma Scale (Davidson et al., 1997). In terms of maternal functioning, it was hypothesized that mothers with both MDD and PTSD would be more likely to have experienced maltreatment as children, exhibit higher levels of depressive symptoms as measured by self-report and clinician ratings, and report lower levels of social support relative to those with MDD and not PTSD. It was hypothesized that mothers with MDD and PTSD would exhibit increased parenting stress and impaired parenting capacities relative to mothers with MDD alone. For both maternal functioning and parenting domains, it was further expected that, for mothers with PTSD and MDD, PTSD symptom severity would be correlated with functional impairment. It was predicted that the avoidance/numbing features of PTSD would be most strongly associated with parenting maladjustment relative to other symptom clusters.

Method

Subjects

Subjects consisted of 90 mothers aged 16 or older with a diagnosis of Major Depressive Disorder (MDD) who participated in a home visitation program. Mothers were recruited as part of a clinical trial to test an in-home treatment for depression, and data used in this study were obtained during the baseline assessment. Mothers were enrolled in Every Child Succeeds (ECS), a regional home visitation program serving seven counties in Southwestern Ohio and Northern Kentucky. ECS utilizes two national models of home visitation: Nurse-Family Partnership (NFP; Olds, 2002) and Healthy Families America (HFA; Daro & Harding, 1999). Participating mothers had at least one of three other sociodemographic risk characteristics needed for eligibility: unmarried, low income, inadequate prenatal care. Mothers were enrolled prior to 28 weeks gestation in NFP as per model parameters and from 20 weeks gestation through the child reaching 3 months of age for HFA. Mothers were referred from prenatal clinics, hospitals, social service agencies, and community physicians. In the NFP, home visits are provided by nurses while in HFA, home visits are provided by social workers, or related professionals and paraprofessionals. The goals of ECS are to (1) improve pregnancy outcomes through nutrition education and substance-use reduction; (2) support parents in providing children with a safe, nurturing, and stimulating home environment; (3) optimize child health and development; (4) link families to health care and other needed services; and (5) promote economic self-sufficiency in families (Ammerman, Putnam, et al., 2007).

Mothers with MDD were divided into those with (PTSD+, $n = 35$, 37.6%) and without (PTSD-, $n = 55$, 62.4%) a comorbid diagnosis of PTSD based on psychiatric interview and self-report of PTSD severity. PTSD was the most common psychiatric co-morbidity in the sample. Other current diagnoses (in order of prevalence) in addition to MDD were Generalized Anxiety Disorder (36.6%), Obsessive-Compulsive Disorder (26.9%), Social Phobia (20.4%), Panic Disorder (17.2%), and Dysthymic Disorder (16.1%). Table 1 presents the demographic characteristics of the PTSD+ and PTSD- Groups. For the sample as a whole, mothers were young ($M = 22.1$ [$SD = 4.6$]), predominantly Caucasian (62.2%) and African American (33.3%), unmarried (85.6%), and low income (93.3% household incomes < \$30,000). No differences were found between mothers in the PTSD+ and PTSD- groups

on demographics. In terms of home visitation model, 78 mothers were in the HFA model and 12 in the NFP model. Mothers had received a mean of 14.0 home visits ($SD = 9.2$) prior to assessment. No differences were found between mothers with and without PTSD on home visitation model, $\chi^2(1) = 0.1, p > .05$ or number of home visits received, $t(88) = 1.2, p > .05$. In addition, no differences were found between groups on other psychiatric comorbid diagnoses ($p > .05$). Eighty-five participants were first-time mothers, and eight (all received the HFA home visitation model and were divided equally between the two PTSD groups) had two or more children ($M = 3.1$ ($SD = 1.1$)).

Procedures

Mothers were recruited in a two-step process. In the first step, they completed the Edinburgh Postnatal Depression Screen (EPDS; Cox, Holden, & Sagovsky, 1987) at 3 months postpartum. Mothers receiving a score of ≥ 11 , suggestive of depressive severity consistent with a diagnosis of MDD, were approached to participate in the study. Interested mothers then received an in-home assessment consisting of a semistructured psychiatric interview and administration of additional measures of maternal functioning and parenting. Inclusion criteria were ≥ 16 years of age and current diagnosis of MDD. Exclusion criteria were bipolar disorder, current substance dependence, psychosis, mental retardation, suicidality or homicidality requiring acute intervention, or current use of psychotropic medications or psychotherapy. Of the 114 mothers who were assessed, 21 (18.3%) were found to be ineligible. Reasons for ineligibility were: did not meet criteria for MDD (8), had bipolar disorder (6), had a concurrent medical condition contributing to depressive symptoms (2), in need of acute psychiatric attention (2), taking a psychotropic medication (1), psychotic symptoms (1), and mental retardation (1). There were no differences between eligible and ineligible mothers on maternal age, race, education, family income, marital status, or EPDS score ($p > .05$). All assessments were conducted in the home over one or two sessions. The study was approved by the Institutional Review Board at Cincinnati Children's Hospital Medical Center.

The PTSD group was identified using two criteria. First, mothers met a diagnosis of Current PTSD using the SCID. Second, these mothers obtained a score ≥ 40 on the Total Score of the Davidson Trauma Scale (DTS; Davidson et al., 1997). This stringent two-step approach to identify PTSD was used to ensure that PTSD was accurately identified against the backdrop of a sample of mothers with significant psychopathology in which identification of comorbid diagnoses was complicated. Of the 38 mothers who met diagnostic criteria for PTSD using the SCID, 35 (92.1%) also exceeded the established cutoff of ≥ 40 on the DTS and these mothers formed the PTSD+ Group. Although most mothers in this group reported multiple traumas, those events that were identified by mothers using the SCID as affecting them the most involved sexual abuse in childhood (31.4%), sexual assault in adulthood (22.9%), physical assault in adulthood (14.3%), witnessing a death (14.3%), physical abuse in childhood (11.4%), and witnessing family violence (5.4%). In order to maximize homogeneity within each of the groups, the three mothers who met the PTSD criterion only were dropped from consideration and not included in either group yielding $N = 90$ for the sample.

Measures

Psychiatric status and maternal functioning

Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I, January 2007 version; Spitzer, Williams, Gibbon, & First, 1992): The SCID is a semistructured psychiatric interview that is widely used in research and clinical practice. It is used to diagnose 14 common psychiatric disorders (including MDD and PTSD). Interrater reliability is generally high, ranging from .57–1.00 (Zanarini & Frankenburg, 2001), and validity is

well established (Shear et al., 2000). Data derived from the measure include diagnosis, specific symptom endorsements, severity of MDD, and current and lifetime manifestations of PTSD and MDD and other psychiatric comorbidities. For the study as a whole, interviews were audio-recorded and 25% were rated by a second rater yielding a kappa coefficient = .90 for the MDD diagnosis.

Hamilton Depression Rating Scale (HDRS; Hamilton, 1960): The first 17 items of the HDRS were used as part of the psychiatric interview. The HDRS is a clinician rating that consists of depressive symptoms which are recorded using 5- or 3-point scales reflecting presence and severity over the past week. For the study as a whole, 25% of audio-recorded HDRS administrations were rated by a second rater yielding an intraclass correlation coefficient of .93.

Global Assessment of Functioning Scale (GAF; American Psychiatric Association, 1994): The GAF is a 100-point scale divided into 10 categories reflecting degree of adaptive functioning. This is a widely used index that is frequently applied in conjunction with standardized psychiatric interviews, and has acceptable psychometrics (Jones, Thornicroft, Coffey, & Dunn, 1995). For the study as a whole, 25% of audio-recorded interviews were rated by a second rater yielding an intraclass correlation coefficient of .84.

Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987): The EPDS is a 10-item self-report measure of depressive symptoms. Items consist of depressive symptoms that are endorsed on a four-point scale indicating occurrence and severity over the past week, yielding a total score. The EPDS was used to screen mothers for eligibility for the full assessment using a cutoff of 11. The measure was readministered at the assessment and this score was used in the current study.

Brief Symptom Inventory (BSI; Derogatis, 1993): The BSI is a brief version of the widely used Symptom Checklist-90 (SCL-90), a measure of psychological maladjustment. The BSI consists of 53 items endorsed using a 5-point scale reflecting level of distress of each symptom. Standardized scores are yielded for three global and nine clinical scales. As the Global Symptom Index (GSI) is considered the most reliable indicator of overall distress (Derogatis & Spencer, 1989), analyses were restricted to this scale in the current study.

Interpersonal Support Evaluation List (ISEL; Cohen & Hoberman, 1983): The ISEL is a widely used measure of social support that has been utilized with both clinical and nonclinical populations. This 40-item measure consists of statements regarding the availability of tangible and emotional support that are endorsed using a 4-point scale reflecting the degree to which they are true. Scores on four subscales are also available (Appraisal, Tangible, Self-Esteem, and Belonging) although in this study only the Total Score was used in analyses. The ISEL has excellent reliability and validity (Cohen & Hoberman, 1983).

PTSD and child maltreatment history

Childhood Trauma Questionnaire (CTQ; brief version; Bernstein et al., 2003): The CTQ is a 28-item version of the larger CTQ. Items describe maltreatment experiences in childhood and are endorsed on a 5-item Likert scale reflecting how true they are. Scores on five clinical scales are derived: Physical, Sexual, Emotional Abuse, Physical Neglect, and Emotional Neglect. The CTQ has excellent internal reliability (.61 to .94 in both clinical and community samples) and correlates highly with clinician determinations of maltreatment (Bernstein et al., 2003). The CTQ was analyzed using both the total raw score and a

consolidated version of severity categories (none vs. mild, moderate, or severe) for each of the clinical scales.

Davidson Trauma Scale (DTS; Davidson et al., 1997): The DTS is a 17-item self-report questionnaire of posttraumatic stress symptoms completed by individuals who have experienced a trauma. Respondents initially indicate the trauma that is most disturbing to them. Then, each of the 17 items is completed as to “how often in the last week the symptom troubled you and how severe it was.” Frequency and severity of symptoms are rated using a 5-point Likert scale. For this study, severity scores were determined for the total scores and three subscales—Intrusion, Avoidance/Numbing, and Hyperarousal. The DTS was administered to participants who obtained a diagnosis of PTSD on the SCID only.

Parenting and child functioning

Ages and Stages Questionnaire: Social-Emotional (ASQ: SE; Squires, Bricker, & Twombly, 2002): The ASQ: SE is a parent-report measure of social and emotional adaptive functioning in children aged 6 – 60 months. There are eight versions reflecting 6-month intervals between 6 and 60 months of age, and number and content of items changes across versions to reflect developmental relevance. Items are organized around seven domains of social and emotional development: self-regulation, compliance, communication, adaptive functioning, autonomy, affect, and interaction with people. A total standardized score is derived reflecting overall social and emotional functioning. The ASQ: SE has been extensively researched and found to have acceptable validity and reliability properties (Squires et al., 2002).

HOME Inventory (HOME; Caldwell & Bradley, 1984): The HOME is a standardized observational measure of features in the home consistent with a stimulating, nurturing, and safe environment. Internal (.84) and test-retest (.62–.74) reliabilities are strong, and the measure correlates moderately with measures of IQ and developmental status. In addition to a total score, scores are also yielded for Responsivity (responsiveness to parent), Acceptance (avoidance of restriction and punishment), Organization (organization of the environment), Learning Materials (availability of appropriate play materials), Involvement (parental involvement and interaction), and Variety (variety in daily stimulation and activities). This measure is widely used in home visitation programs and has frequently documented the impact of such programs (Kendrick et al., 2000).

Parenting Stress Index-Short-Form (PSI-SF 3rd ed.; Abidin, 1995): The PSI-SF is a 36-item parent report measure of child and parent functioning/coping. This widely used measure yields standardized scores on Total Stress, Parental Distress, Parent-Child Dysfunctional Interaction, and Difficult Child. The PSI-SF has excellent psychometric properties and is widely used in parenting research.

Overview of Analyses

Analyses first contrasted the PTSD+ and PTSD– groups on maternal functioning, parenting, and child adjustment using MANOVAs and follow-up univariate comparisons. Second, correlations were obtained between severity of PTSD symptoms and parenting and child adjustment variables. And third, hierarchical linear regression was used to examine the relative contribution of PTSD symptoms to parenting variables.

Results

Contrasts Between PTSD+ and PTSD– Groups

To control for multiple comparisons, two MANOVAs were conducted with maternal functioning and parenting/child adjustment variables, respectively. Table 2 presents the means, standard deviations, and t-values for univariate comparisons. In the first MANOVA, groups were contrasted on the HDRS, EPDS, GAF, BSI-GSI, ISEL, and CTQ. This comparison yielded a statistically significant result (Wilks' $\lambda = 3.4, p < .01$). Follow-up univariate comparisons revealed that mothers with MDD and PTSD reported and received clinical ratings indicating more severe levels of depression and functional impairment and had lower levels of social support relative to those with MDD only.

Mothers with MDD and PTSD reported more severe experiences of child maltreatment in contrast to those with MDD only. Table 2 also shows the breakdown of experiences of types of child maltreatment from the CTQ, reflecting bivariate categories of no experience versus mild, moderate, or severe trauma in childhood. Results show that both groups reported extensive experiencing of each type of child maltreatment ranging from 62.9%–85.7% in the PTSD+ Group and 32.7%–76.4% in the PTSD– Group between categories. Statistically significant group differences on categories of maltreatment were found for Sexual Abuse and Physical Neglect. The contrast between the two groups was most evident in Sexual Abuse in which mothers with MDD and PTSD reported significantly more sexual abuse experiences than their counterparts with MDD alone (80.0% vs. 32.7%). However, Physical Abuse approached but did not reach statistical significance ($p < .10$), and this was in the direction of the PTSD+ Group reporting higher rates of these forms of maltreatment relative to the PTSD– Group. In the second MANOVA, groups were contrasted on the ASQ:S-E, HOME Total, and PSI-SF Total. This yielded a nonsignificant result (Wilks' $\lambda = 0.9, p > .05$).

Correlations Between PTSD Symptom Severity, Maternal Functioning, and Parenting/Child Adjustment

Table 3 presents the correlations between the three scales of the DTS reflecting trauma symptom severity (Intrusion, Avoidance/Numbness, Hyperarousal) and maternal and child variables in the PTSD+ Group. In this table, subscales of the HOME Inventory and PSI-SF are presented. Results indicate differential patterns of associations between dimensions of trauma symptom severity and maternal functioning, parenting, and child adjustment. All three DTS scales were moderately correlated with overall psychopathology as measured by the BSI-Global Severity Index indicating that even within this subsample of mothers with both MDD and PTSD, trauma symptom severity covaries with additional psychiatric symptoms. All three DTS scales were associated with self-reported depression (EPDS), but not with clinician ratings of depression (i.e., HDRS). The DTS Avoidance/Numbness Scale stands out in its robust relationships with social support (ISEL) and with two aspects of parenting—Acceptance (HOME Inventory) and Personal Distress (PSI-SF). In contrast, neither the DTS Intrusion nor Hyperarousal Scales were significantly correlated with parenting and child variables.

Regression Analysis

Hierarchical linear regressions were conducted to determine the relative contributions of the DTS Avoidance/Numbness Scale to Acceptance (HOME Inventory) and Parenting Distress (PSI-SF) after controlling for selected demographics, social support, and depression. These variables were selected as they were the scales most strongly related to the DTS Avoidance/Numbness Scale. Social support was added as a covariate given its correlation with Acceptance (HOME Inventory, $r = .34, p < .05$), Parenting Distress (PSI-SF, $r = -.34, p < .$

05), and the DTS Avoidance/Numbness Scale ($r = -.47, p < .01$), and the overarching objective isolating the contribution of the DTS Avoidance/Numbness Scale. In the first regression, Acceptance was the dependent variable, and independent variables were inserted in three sequential blocks: (1) mother age, social support (ISEL), and number of children; (2) depression (HDRS), and (3) DTS Avoidance/Numbness Scale. The clinician-rated HDRS was used to reflect depression instead of the self-reported EPDS in order to reduce colinearity resulting from shared method variance. The final regression was significant, $F(5, 32) = 3.1, p < .05$ and yielded an adjusted $R^2 = .23$. The ISEL was statistically significant ($p < .05$) in the first two steps, although it was not significant in the final model when the DTS Avoidance/Numbness Scale was added. Demographic variables and the HDRS were nonsignificant at each step in which they were entered. Only the DTS Avoidance/Numbness Scale was significant in the final model ($\beta = -.45, t = -2.6, p < .05$).

In the second regression, Personal Distress was the dependent variable. The three blocks were added in the identical order as was used in the first regression. The final regression was statistically significant, $F(5, 32) = 3.4, p < .05$ and yielded an adjusted $R^2 = .26$. Only the HDRS score was significant at each step in which it was entered, yielding a $\beta = .47 (t = 2.8, p < .01)$ in the final model. The DTS Avoidance/Numbness Scale was nonsignificant ($p > .05$).

Discussion

This is the first study to examine PTSD in new mothers participating in home visitation. Results indicated that, in a sample of mothers with Major Depressive Disorder (MDD), a diagnosis of PTSD and PTSD symptom severity were associated with impaired maternal emotional and social functioning and certain aspects of parenting. As these are important areas for home visitation that are typically targeted for change, explicating the impact of PTSD on mothers and children has important implications for home visitation. These findings add to the growing literature that mental health problems are prominently represented in mothers in home visitation, and warrant increased attention and further study.

PTSD was associated with greater impairment in maternal functioning against the background of concurrent MDD. Mothers with both MDD and PTSD had elevated levels of depressive symptoms as measured by both self-report and clinician ratings and decreased perceived social support relative to those with MDD alone. For mothers with PTSD and MDD, elevated levels of all three clusters of PTSD dimensions were correlated with increased psychiatric symptoms. Intrusion and Avoidance/Numbness was associated with increased self-reported depression, and Avoidance/Numbness was related to social support. Moreover, in this sample of mothers in home visitation, these associations were not modified by home visitation model, number of children, or number of home visits received. Taken together, findings are consistent with previous research indicating that, in those with MDD, concurrent PTSD imparts greater impairment in social and emotional functioning than MDD alone (Oquendo et al., 2003).

The lower levels of social support reported by mothers with PTSD and MDD relative to those with MDD alone highlight the particular importance of this variable. Although diminished social support is often reported in both conditions, it has been called out as “the major posttraumatic factor” in determining the manifestation and persistence of PTSD among those experiencing trauma (Friedman et al., 2007). Given the cross-sectional nature of the current study, it is not known if the lower levels of social support in mothers with MDD and PTSD reflect premorbid vulnerabilities that contributed to the expression of PTSD, outcomes of PTSD related to symptom features (e.g., avoidance) that interfere with interpersonal functioning, or associated features of both psychiatric disorders.

Disaggregating these relationships and their etiologic roles is a key area in need of further research.

The diagnosis of PTSD was not associated with impairments in parenting or child adjustment in depressed mothers. However, examination of PTSD symptom severity revealed a more complicated relationship with parenting. Avoidance/Numbness was associated with lower scores on Acceptance as measured in the HOME Inventory and higher scores in Total Parenting Stress and Personal Distress as measured by the PSI-SF. The Acceptance scale reflects the mother's use of corporal punishment, criticism and scolding, restriction, and consideration of the child's needs. Moreover, Banyard et al. (2003) reported an association between harsh parenting and maternal experiences of trauma. As hypothesized, and consistent with previous research on PTSD and parenting (e.g., Ruscio et al., 2002), Avoidance/Numbness was the primary PTSD symptom cluster associated with disruptions in parenting. This dimension of PTSD may contribute to maternal insensitivity to child cues and expression and modulation of affective channels of the mother-child relationship. Specifically, Avoidance/Numbness may interfere with maternal recognition of frustration and stress until it builds up to a point where mothers react in a harsh and punitive manner.

In this sample of mothers with MDD, childhood trauma experiences were common. The link between trauma and depression is well established (Heim, Newport, Mletzko, Miller, & Hemeroff, 2008), and such a pattern among mothers with MDD in home visitation is no exception. Research has demonstrated that depression is common in mothers in home visitation, and it is likely that child maltreatment is one of the etiologic pathways that contributed to elevated prevalence rates. In the current study sexual abuse was most strongly associated with PTSD, with 80.0% of the PTSD+ Group reporting such experiences in contrast to 32.7% in the MDD only group, although both physical neglect and physical abuse experiences were more commonly reported in the PTSD+ Group. Childhood sexual abuse has been strongly linked to PTSD and other negative outcomes (Putnam, 2003). As such, presence of a sexual abuse history is a red flag for possible PTSD in home visiting populations.

PTSD was the most common comorbid disorder found in this sample of mothers with MDD, affecting 37.6% of the sample. There are no data available on the prevalence of PTSD in mothers in home visitation, although prevalence of depression in this population suggests that rates are considerably higher than those in the general population. For example, Ammerman et al. (2009) reported that, in the first year of service, 45.3% of mothers in home visitation had clinically elevated levels of depressive symptoms as measured by the BDI-II. Although not all of these likely met criteria for MDD, a sizable proportion probably present with this level of clinical severity, and a substantial subgroup is likely to present with comorbid PTSD. The high rate of trauma experiences in mothers in home visitation likely leads to PTSD or clinically significant PTSD symptoms both with and without concurrent MDD. Because of this, screening for PTSD is warranted, and a number of brief screens that would be feasible in a home visitation setting are available (Brewin, 2005).

The prevalence of PTSD and the associated impairment in maternal functioning and parenting found in this sample has important treatment implications. Research has clearly documented that mothers in home visitation rarely access evidence-based treatment for mental health problems (Administration on Children Youth & Families, 2002). Although increased awareness of PTSD among mothers and home visitors as a result of screening may facilitate linkage to treatment resources, barriers to obtaining care (e.g., transportation needs) are numerous and difficult to overcome. Providing treatment in the home setting is an appealing strategy to addressing these concerns. Ammerman and colleagues (Ammerman et

al., 2007; Ammerman, Putnam, Stevens, et al., 2010) provide an example of such an approach in which an adapted treatment for maternal depression was designed and implemented in the home setting (i.e., In-Home CBT). Beeber et al. (2010) developed a version of Interpersonal Psychotherapy that was delivered in the homes of mothers participating in Early Head Start. These efforts provide a framework to guide analogous treatment for PTSD in this difficult to reach population.

The study had several strengths. First, depression and PTSD were measured by both clinician ratings derived from semistructured interviews as well as self-report. This increases confidence that mothers met stringent criteria for PTSD. Second, there are relatively few studies of PTSD and parenting, and this study adds to this emerging literature. Third, parenting was measured using instruments that incorporated observational elements (i.e., HOME Inventory) and maternal self-report. Fourth, this is one of the few studies that examine PTSD in a diverse population of young, low income mothers who are early in their parenting roles. As noted, these mothers infrequently come to the attention of clinic-based professionals, and as a result are underrepresented in the literature. Studying parenting and PTSD in mothers who are early in their parenting roles provides an opportunity to identify emerging challenges that contribute to negative trajectories in later years. Fifth, the sample was representative of home visitation programs in terms of demographics, urban and rural residences, and two national models of home visitation. As a result, findings are generalizable to many home-visited populations.

There are also limitations to the study that warrant caution in interpreting findings. First, the sample size was relatively small, particularly for analyses conducted on the PTSD+ group. Small sample sizes restrict statistical power, and preclude use of analytic strategies that require larger Ns. Future research should seek to recruit larger samples that will allow more complex analyses that take modifiers into account. Second, findings may not be generalizable to other populations that differ in social resources or demographics. Third, although the HOME Inventory has observational elements, parenting was not otherwise directly measured. Use of observational approaches in which parent–child interactions are rated for specific relationship features would add to our understanding of the association between PTSD and parenting difficulties (e.g., Lyons-Ruth et al., 2005). Fourth, the cross-sectional nature of the data does not allow for examination of changes over time or mediators of change. Longitudinal studies are needed for these purposes. Fifth, although child maltreatment history was measured, more recent experiences of trauma were not systematically obtained. The list of traumas elicited by the SCID provide some information about exposure to violence in adulthood, but these were gathered in mothers with PTSD only, and it is possible that those in the PTSD– Group also experienced intimate-partner violence or other forms of more proximal trauma. A comprehensive assessment of trauma experienced across the life span is desirable in future studies. And sixth, because all mothers were diagnosed with MDD, it was not possible to disaggregate the relative contributions of MDD and PTSD to maternal functioning and parenting. In addition, future research would benefit from exploration of potentially moderating variables in mothers in home visitation with MDD and PTSD. These include the network structure of social supports (e.g., partner, family, neighborhood), elucidating the temporal onset of MDD and PTSD and its implications for outcomes, and differential biomarkers in mothers with MDD and with or without PTSD.

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Table 1

Demographic Characteristics of MDD Mothers in the PTSD+ (n = 35) and PTSD– (n = 55) Groups

Variable	PTSD+ Group	PTSD– Group	<i>t</i> or χ^2	<i>p</i> -value
	<i>M</i> (<i>SD</i>) or <i>N</i> (%)	<i>M</i> (<i>SD</i>) or <i>N</i> (%)		
Mother age (years)	21.8 (3.7)	22.2 (5.1)	30.5	ns
Mother race				
White	21 (60.0%)	35 (63.7%)	4.5	ns
African American	12 (34.3%)	18 (32.7%)		
Native American	0 (0.0%)	1 (1.8%)		
Native Hawaiian or other Pacific Islander	2 (5.7%)	0 (0.0%)		
Bi-racial	0 (0.0%)	1 (1.8%)		
Marital status				
Single, Never married	30 (85.7%)	47 (85.5%)	1.7	ns
Married	4 (11.4%)	8 (14.5%)		
Separated	1 (2.9%)	0 (0.0%)		
Education (years)	11.5 (1.5)	11.5 (2.0)	–0.1	ns
Income				
\$0–9,999	23 (65.7%)	28 (50.9%)	3.4	ns
\$10,000–19,999	5 (14.3%)	14 (25.5%)		
\$20,000–29,999	5 (14.3%)	9 (16.4%)		
\$30,000–39,999	1 (2.9%)	2 (3.6%)		
\$40,000–49,999	1 (2.9%)	1 (1.8%)		
\$50,000–above	0 (0.0%)	1 (1.8%)		
Child's age (days)	167.2 (84.5)	143.2 (65.5)	1.4	ns
Child's gender				
Male	16 (45.7%)	23 (41.8%)	0.1	ns
Female	19 (54.3%)	32 (58.2%)		

Table 2

Comparisons of MDD Mothers in the PTSD+ (n = 35) and PTSD– (n = 55) Groups on Measures of Maternal Functioning and Parenting/Child Adjustment

Variable	PTSD+ Group	PTSD– Group	<i>t</i> or χ^2
	<i>M</i> (<i>SD</i>) or <i>N</i> (%)	<i>M</i> (<i>SD</i>) or <i>N</i> (%)	
Child Maltreatment History			
CTQ Total Score	69.6 (24.6)	52.1 (18.0)	3.7**
CTQ Maltreatment Categories			
Emotional Abuse			
Yes	30 (85.7%)	42 (76.4%)	1.3
No	5 (14.3%)	13 (23.6%)	
Physical Abuse			
Yes	25 (71.4%)	27 (49.1%)	3.4 ^a
No	10 (28.6%)	28 (50.9%)	
Sexual Abuse			
Yes	28 (80.0%)	18 (32.7%)	18.5**
No	7 (20.0%)	37 (67.3%)	
Emotional Neglect			
Yes	27 (77.1%)	39 (70.1%)	0.3
No	8 (22.9%)	16 (29.9%)	
Physical Neglect			
Yes	22 (62.9%)	22 (40.0%)	4.2*
No	13 (37.1%)	33 (60.0%)	
Maternal Functioning			
EPDS	20.1 (3.8)	18.3 (4.0)	2.0*
HDRS	23.5 (3.9)	20.8 (4.8)	2.8**
GAF	54.0 (6.3)	56.9 (6.2)	–1.8 ^a
BSI-GSI	75.4 (5.4)	73.7 (5.4)	1.3
ISEL Total	51.6 (21.7)	62.0 (20.8)	–2.2*
Parenting and Child Adjustment			
ASQ:S-E	29.3 (20.0)	24.7 (14.8)	1.1
HOME Total	30.7 (6.5)	31.7 (5.8)	–0.7
PSI-SF Total	90.3 (21.2)	82.3 (17.8)	1.6

Note. CTQ = Childhood Trauma Questionnaire; EPDS = Edinburgh Postnatal Depression Scale; HDRS = Hamilton Depression Rating Scale; GAF = Global Assessment of Functioning; BSI-GSI = Brief Symptom Inventory Global Severity Index; ISEL = Interpersonal Support Evaluation List; ASQ:S-E = Ages and Stages Questionnaire: Social-Emotional; HOME = Home Inventory; PSI-SF = Parenting Stress Index-Short Form.

^a $p < .10$.

* $p < .05$.

** $p < .01$.

Table 3

Correlations Between Measures of Maternal Functioning and Parenting and the Intrusion, Avoidance/ Numbness, and Hyperarousal Scales of the Davidson Trauma Scale in the PTSD+ Group (n = 35)

	Intrusion	Avoidance/Numbness	Hyperarousal
CTQ	.30	.37*	.27
EPDS	.40*	.38*	.31
HDRS	.09	.11	.15
GAF	-.27	-.12	-.22
ISEL	-.27	-.47**	-.16
BSI-Global Severity Index	.47**	.49**	.41*
ASQ:S-E	.15	-.02	.18
HOME Responsivity	-.11	-.11	.04
HOME Acceptance	-.27	-.46**	-.04
HOME Organization	.13	-.10	.05
HOME Learning Materials	-.12	-.08	-.21
HOME Involvement	-.05	-.10	-.15
HOME Variety	.04	.07	-.03
HOME Total	-.14	-.23	-.09
PSI-SF Personal Distress	.00	.57**	.08
PSI-SF Parent-Child Dysfunctional Interaction	.23	.13	.19
PSI-SF Difficult Child	.21	.28	.22
PSI-Total	.19	.39*	.21

Note. CTQ = Childhood Trauma Questionnaire; EPDS = Edinburgh Postnatal Depression Scale; HDRS = Hamilton Depression Rating Scale; GAF = Global Assessment of Functioning; BSI-GSI = Brief Symptom Inventory Global Severity Index; ISEL = Interpersonal Support Evaluation List; ASQ:S-E = Ages and Stages Questionnaire: Social-Emotional; HOME = Home Inventory; PSI-SF = Parenting Stress Index-Short Form

*
 $p < .05$.

**
 $p < .01$.