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Maternal Depression in Home Visitation: A Systematic Review

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Abstract

Depression is prevalent in new mothers and has been shown to have profound negative impacts on parenting, maternal life course, and child development. High rates of maternal depression have been found in home visitation, a widely disseminated prevention approach for high risk mothers and their children. This paper reviews the emerging literature on the prevalence, impact, and treatment of depression in the context of home visitation. Findings are synthesized and methodological and design limitations are considered in interpretation of results. Promising approaches to addressing maternal depression and supporting home visitors in working with this clinical population are described. Recommendations for research and practice are offered that build upon the strong foundation of current efforts in this area.

Keywords

maternal depression; home visitation; screening; prevention

1. Introduction

Intensive home visitation is a promising prevention strategy for young children and their families (Guterman, 2001). Originally designed to prevent child abuse and neglect, home visitation programs have broadened to encompass multiple approaches to optimize child health and development. Although there is significant variability in the formats and strategies used by home visitation models, they all share six common elements: (1) enrollment early in the child's life (or prenatally) in order to intervene before negative outcomes are manifested, (2) engagement of mothers early in their roles as parents before maladaptive parenting practices become established and resistant to change, (3) strengthening of individual and family protective factors and mitigating risk factors to set child trajectories in the direction of normative development, (4) use of multiple strategies and resources to address varied child and family needs, (5) frequent contact between home visitors and families to allow sufficient opportunity to deliver curricular elements, and (6) extended program duration to ensure that home visitors are present during developmental transitions in which new needs of children and families emerge.

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Home visitation programs vary in enrollment criteria and structure. These include targeted or universal enrollment, first-time or multiparous mothers, time of enrollment (prenatal vs. postnatal), background and training of home visitors, frequency of home visits, length of service, and curricula. Home visitation programs typically enroll families that have sociodemographic factors associated with elevated risk for poor parenting outcomes, such as low income, young age, and/or unmarried status. Examples of home visitation programs that are widely disseminated include Nurse-Family Partnership (Olds, 2002), Healthy Families America (Daro & Harding, 1999), Parents as Teachers (Zigler, Pfannenstiel, & Seitz, 2008), and Early Head Start (Administration on Children Youth and Families, 2002). In home visitation, a home visitor (who, depending on the program model, is a nurse, social worker, or paraprofessional) provides psychoeducational training and case management services to mothers and children. Home visits, which begin as early as the prenatal period and last until the child reaches two to five years of age, focus on diverse areas such as parenting skills, mother-child relationship, home safety, maternal health, and infant nutrition. Studies examining the effectiveness of home visitation indicate that focused and tightly implemented programs can achieve compelling outcomes including improved positive parenting, enhanced child health and development, and reduced infant mortality (Administration on Children Youth and Families, 2002; Donelan-McCall, Eckenrode, & Olds, 2009; Donovan et al., 2007; DuMont et al., 2008; Nievar, Van Egeren & Pollard, in press; Sweet & Applebaum, 2004).

Home visitation programs are notable for their intensity of intervention, comprehensiveness of curricula, and broad scope of topics and domains covered. Yet, many families exhibit significant challenges that are insufficiently addressed in home visitation. Three have been consistently identified as important: maternal mental health, substance abuse, and intimate partner violence (Tandon, Parillo, Jenkins, & Duggan, 2005). These challenges undermine home visitation and in turn can adversely affect maternal life course and child developmental trajectories that are the primary targets of service. Although precise figures are unavailable, it is estimated that there are currently over 400 publicly and privately funded home visitation programs providing services for at least 500,000 children in the United States (Gomby, Culross, & Behrman, 1999; Johnson, 2009), representing a substantial investment in this prevention approach. Understanding factors that facilitate or impede benefiting from home visitation is a critical priority to maximize the impact of these programs. Moreover, home visitation programs are among the earliest portals through which sizable numbers of high risk mothers come to the attention of service providers, thereby creating unique opportunities to identify and intervene with mental health and other social needs.

The purpose of this review is to describe and critically examine the literature on maternal depression, the most prevalent of the common challenges in home visitation. Maternal depression and its impact on children has received considerable empirical attention (National Research Council and Institute of Medicine, 2009), yet only recently have the implications of maternal depression to home visitation been considered (Duggan, Berlin, Cassidy, Burrell, & Tandon, 2009). Both the high prevalence and potential negative impact of maternal depression in home visitation warrant a review and synthesis of empirical findings in order to establish the current knowledge base and map out future directions for research and practice. Important questions to be considered include: What is the scope of maternal depression? What is the impact of maternal depression on mothers, children, and home visitors? How does maternal depression impact home visitation, and what is the impact of home visitation on maternal depression? How has maternal depression been addressed in home visitation programs, and what data are available regarding effectiveness, feasibility, and cost of these interventions?

This review describes the features and sequelae of maternal depression during early childhood, the prevalence and implications of depression in home visitation programs, intervening with depression in home visitation, and guidelines for future research in this area. In each section relevant studies are examined, findings described, and methodological limitations considered. The review concentrates primarily on home visitation models that broadly target populations of low income mothers and children. Excluded were programs that are short in duration (e.g., one or two home visits), target a circumscribed clinical population (e.g., substance abusers), focus exclusively on case management, have received minimal empirical attention, or deviate from the six aforementioned common elements of service. In addition, the focus of the review is on identification, impact, and intervention with maternal depression in the context of ongoing home visiting. Interventions that seek to prevent maternal depression in the absence of ongoing home visiting or use home visitation solely with the purpose of preventing depression are not considered.

2. Maternal Depression: Epidemiology, Clinical Features, and Sequelae

Major depressive disorder (MDD) is characterized by discrete episodes separated by intervals of symptom remission. Lifetime prevalence of MDD in women is about 14% (Kessler et al., 2003). Recent research suggests that the prevalence of depression during pregnancy and postpartum is equally high. For example, Evans, Heron, Francomb, Oke and Golding (2001) found a prevalence of 13.5% in a sample of 9,028 pregnant women. Using the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden & Sagovsky, 1987), Mayberry, Horowitz and Declercq (2007) found that between 17.1%–23.1% of new mothers reported moderate-to severe levels of depressive symptoms (EPDS ≥ 13) over four time points spanning two years. Prevalence of depression in sociodemographically high risk women is twice that of their low risk counterparts. (Mora et al., 2009) found that 29% of sociodemographically high risk mothers had elevated levels of depression using the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) from pregnancy through two years postpartum. Sociodemographic variables associated with increased depressive symptomatology and higher rates of MDD at postpartum include low income, low educational achievement, unmarried status, and African American race (Howell, Mora, Horowitz, & Leventhal, 2005; Mayberry et al., 2007; Segre, O'Hara, Arndt, & Stuart, 2007). Each of these is a common feature of populations served by home visitation.

Depression impinges on all aspects of the parenting role which in turn are also targets of home visitation. Relative to their non-depressed counterparts, depressed mothers have been found to be disengaged from their children (Radke-Yarrow, Nottelmann, Belmont, & Welsh, 1993), unable to modulate affect or behavior during mother-child interactions (Field et al., 2007), insensitive to child cues regarding needs and emotional states (Field, 2002), more negative and less positive during interactions (Palaez, Field, Pickens, & Hart, 2008), and talk less to their children (The NICHD Early Child Care Research Network, 2005). Depressed mothers read less to their children (Kavanaugh et al., 2006), are less attentive to health and prevention needs (Minkovitz et al., 2005), and less likely to engage in functional and symbolic play (Bigatti, Cronan, & Anaya, 2001). Dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis in depressed mothers, an index of stress reactivity that is reflected by elevated levels of cortisol in the bloodstream (Feldman et al., 2009), can affect the HPA axis of the developing fetus and influence regulation of this system in young children (Ashman, Dawson, Panagiotides, Yamada, & Wilkinson, 2002). Impaired parenting practices have been found in depressed mothers even during inter-episode intervals during which depressive symptoms are abated (Seifer, Dickstein, Sameroff, Magee, & Hayden, 2001).

Decreased quantity and quality of care and nurturing contributes to a number of short- and long-term deficits in children's development. Children's ability to regulate their emotional state, a key developmental task of infancy, is undermined in the offspring of depressed mothers (Field, 1995). Children of depressed mothers are more likely to develop insecure attachments and exhibit excessive fussiness or withdrawn behavior (Martins & Gaffan, 2000). Negative effects of maternal depression on child development are intensified and accelerated when depression occurs during the postpartum period (Bureau, Easterbrooks, & Lyons-Ruth, 2009), symptoms are severe (Lovejoy, Graczyk, O'Hare, & Neuman, 2000), there are multiple episodes or the course is chronic (Hay, Katsikitis, Begg, Da Costa, & Blumenfeld, 2003), and it is manifested during key stages and transitions for the child in which foundational aspects of social, emotional, behavioral, and cognitive development are formed (Hoffman, Crnic, & Baker, 2006).

3. Prevalence of Maternal Depression in Home Visitation

Several reports have documented the prevalence of maternal depression in home visitation. Stevens, Ammerman, Putnam and Van Ginkel (2002) measured depression in 123 first-time, at-risk mothers receiving a Healthy Families America program. Participants were young (39% were ≤18 years), low income (78%), and predominantly unmarried (90%). Administering the BDI-II at enrollment and using a clinical cutoff of ≥14, results indicated that 28.5% had clinically elevated scores. Further analyses revealed that depressed mothers reported greater incidences of intimate partner violence, rape, child physical abuse, and witnessing violence relative to non-depressed mothers. Depression was also found to be associated with increased child abuse risk and decreased social support and sense of personal control.

Ammerman, Putnam, Altaye, Chen et al. (2009) examined the prevalence and course of depressive symptoms in 806 first time mothers participating in a program utilizing both the HFA and NFP models. Depression was measured using the BDI-II at enrollment and 9 months later. Results indicated that 45.3% of mothers obtained elevated scores (BDI-II ≥ 14) at one or both time points. Either persistent (defined as elevated scores at both time points) or emergent (non-elevated at enrollment but elevated at 9 months) patterns of depression were found in 25.9% of the sample. Severity was high as reflected by a mean BDI-II score of 21.88 (SD=8.16) in mothers with elevated scores at enrollment. Using guidelines developed by Steer, Brown, Beck and Sanderson (2001) to align BDI scores with the psychiatric diagnosis of MDD, 20.0% of mothers obtained scores corresponding to a diagnosis of MDD at enrollment and 16.4% at 9 months. Ammerman et al. further noted that only 14.4% of mothers with elevated depressive symptoms received mental health treatment during the 9 month interval. Significant trauma history was also evident in this sample, with 74.1% reporting at least one interpersonal trauma prior to enrollment in home visitation. Using an HLM analysis that took into account the influences of site and home visitor factors, a worsening course over the 9 months was associated with trauma history, young maternal age, being African American, and symptoms severe enough to lead to mental health treatment.

Chazen-Cohen et al. (2007) reported prevalence of depression in mothers participating in The Early Head Start Research and Evaluation Project (Administration on Children Youth and Families, 2002). Subjects consisted of 3,001 mothers randomly assigned to program and control groups. The investigators used a short version of the CES-D (CES-SD; Ross, Mirowsky, & Huber, 1983) which included 12 of the full measure's 20 items and was administered to mothers recruited from 8 of the 17 Early Head Start sites. Using a cutoff of ≥10, it was found that 57.2% of mothers in the program condition and 58.1% of those in the control group had elevated scores at enrollment. A large proportion of mothers displayed

clinically significant symptom levels at later points: 38.0% program and 37.6% control group when the child was 14 months of age, 31.9% program and 31.2% control group at 36 months, and 31.0% program and 36.0% control group at pre-kindergarten (about 2 years after completion of the program). The clinical trial also documented family members' receipt of mental health treatment. Of mothers who reported clinically elevated levels of depressive symptoms, 32% of families had at least one member who received treatment, although it is unclear what proportion of these were the depressed mothers themselves Administration on Children and Families (2006).

Duggan et al. (2004) reported on maternal depression in mothers participating in Hawaii's Healthy Start Program (HSP). As part of a clinical trial, mothers received the CES-D at annual follow-ups over three years after enrollment using the cutoff of ≥24 as an indicator of likely depression. Results indicated rates of 16%–23% in the HSP and control groups over each of the follow-up assessments, with a general trend of reduced levels over time. Further examination revealed that home visitors struggled to identify depressed mothers and link them with services. Retrospective chart reviews showed that poor mental health in mothers was recognized in only 14% of cases at the third year of follow-up, a rate that increased to only 21% among those mothers who received a higher dosage of services. Among mothers with a higher dosage of services in which poor mental health was recognized, home visitors most often responded within the context of home visits and referred to outside community resources in only 2% of cases. For all mothers with documented poor mental health, only 26% in each condition (HSP vs. controls) reported wanting mental health services at one-year follow-up, a rate that increased to 52% and 59% in the HHS and control mothers, respectively. These mothers obtained services in the community 18%–48% of the time across the three years of follow-up in the HHS group and 20%–55% in the control group, a statistically non-significant difference.

The CES-D was also used in the evaluation of Healthy Families Alaska (Duggan et al., 2007). Using the lower but widely used criterion of ≥16 for the CES-D at enrollment, 52% of mothers in the intervention group were in the elevated range as were 61% of the control mothers. At two year follow-up, data were reported using the more stringent ≥24 cutoff, a level observed in 17% and 22% of the intervention and control groups, respectively. Among those with documented poor mental health, 38% received referrals to mental health services. In a subsequent report, Duggan et al. (2009) noted that 28% of at risk mothers participating in both the intervention and community control groups (n=325) obtained CES-D scores of ≥24 points at enrollment. Rates were higher in older mothers (≥20 years) and those experiencing intimate partner violence.

Mitchell-Herzfeld, Izzo, Greene, Lee and Lowenfels (2005) described prevalence of depression in 1157 mothers who participated in a clinical trial of the Healthy Families New York program. In a report of the first year findings, 40.0% of mothers in the intervention group and 43.7% of their control counterparts scored above the cutoff of ≥16 on the CES-D administered at baseline. At one year follow-up, these percentages were 29.0% and 31.2% for intervention and control mothers, respectively.

The Evaluation of Healthy Families Massachusetts (Jacobs & Easterbrooks, 2005) used the CES-D (cutoff: ≥16) administered to 361 participating mothers at four time points starting at enrollment and separated by 6 month intervals. Although there was sample attrition between time points, results indicated a high rate of depression. Specifically, in the sample of mothers who participated fully in the home visitation program, prevalence rates ranged from 44.3% to 50.4% across the 18 month interval. Particularly notable is the finding that 69.8% scored in the elevated range on at least one administration of the CES-D. Transient depression, defined as obtaining scores above the cutoff on one or two of four

administrations, was observed in 42.9% of mothers, and chronic depression (scores above the cutoff on at least three of four administrations) was found in 26.9% of the sample. Correlations between 0.19–0.33 were found between maternal depression and childhood history of abuse and parental overprotection, intimate partner violence, poor neighborhood conditions, and financial stress.

3.1. Synthesis and Methodological Issues

Synthesizing findings from these studies is complicated by variations in populations, measurement, and timing of administration. Although poverty is a common feature of the samples, there are differences in number of children, age of children at enrollment, and geographic and cultural diversity. The most widely used depression screens were the CES-D (both short and long forms) and BDI-II. However, some studies have used broad mental health screens that include some depressive symptoms but do not yield summary scores for depression specifically (e.g., Olds et al., 2002). These measures differ in number of items, and although there is overlap in content the two measures have different psychometric characteristics. Both cover the two weeks prior to completion, in contrast to the one week interval in the also widely used EPDS. Concern has been expressed about the vulnerability of the CES-D and BDI-II (and most other screens for depression) to yield inflated scores in women who complete the measure during late pregnancy and early postpartum. This is because of the overlap between some depressive symptoms (e.g., fatigue) and common features of pregnancy and early postpartum (Beck & Gable, 2001). However, the implications of this confound appear to be modest (Ammerman, Putnam, Altaye, Chen et al., 2009). The timing of administrations varied considerably in the reported studies, ranging from single administrations at enrollment through multiple administrations across the length of service.

Despite such variations in population and method, there is a striking convergence of findings. Each of the studies reported high levels of maternal depressive symptoms. These ranged from 28.5%–61% exceeding clinical cutoffs at enrollment. Multiple administrations of depression measures revealed even higher rates by incorporating mothers who develop clinically significant symptoms during receipt of services. Several studies identified a subgroup of mothers, numbering up to a quarter of participants, who have a persistent course of depression over time. Although there is a general trend for number and severity of depressive symptoms to drop over the course of services, a sizable proportion of mothers are depressed at each administration. Clearly, maternal depression is highly prevalent in home visitation and evident from enrollment through the end of services.

Although clinically elevated levels of depressive symptoms have been identified using brief screens, it is not known to what extent mothers met diagnostic criteria for Major Depressive Disorder (MDD). Such a determination would require administration of semi-structured diagnostic interviews. The distinction between a diagnosis of MDD and exceeding a clinical cutoff for a screen is important in determining intervention strategies. Mothers with MDD would likely benefit from evidence-based treatments for this condition, including cognitive-behavioral therapy, interpersonal psychotherapy, or antidepressant medication. Those with elevated symptoms without meeting criteria from MDD may be responsive to less intensive interventions focused on mood management and acquiring more effective skills for coping with stress.

The primary goal of screening for depression is to identify those with clinically significant symptoms and facilitate referral to appropriate treatment. Several studies suggest that home visitors often do not recognize clinically elevated depression (Duggan et al., 2004). In addition, others have consistently found that depressed mothers infrequently obtain treatment (Ammerman, Putnam, Altaye, Chen et al., 2009). Even when treatment is

obtained, it is not known how many receive evidence-based treatments or if mothers adhere to treatment regimens that are often difficult to maintain. There are numerous possible reasons for why depressed mothers do not receive treatment. When mothers exhibit high levels of depressive symptoms, home visitors may become overwhelmed by other and more proximal needs such that referral to mental health treatment may be less of a priority. If depression is recognized, there are multiple barriers to obtaining care, including stigma, limited transportation, and financial problems. Multiple moves and unstable insurance coverage makes it difficult to maintain continuous and consistent mental health care. Many communities have few mental health resources such that mothers go untreated even when they are willing and able to obtain services. The myriad impediments to receiving effective mental health treatment in this population mean that no single solution to resolving the problem is likely to emerge.

Additional areas that deserve greater empirical scrutiny are the clinical and social correlates of depression. Several studies (Ammerman, Putnam, Altaye, Chen et al., 2009; Jacobs & Easterbrooks, 2005) reported high rates of trauma and intimate partner violence in depressed mothers, which in turn were associated with an unremitting course over time. Psychiatric comorbidity is common in depression and has been noted in depressed mothers in home visitation in particular (Ammerman et al., 2005). Efforts to address maternal depression in home visitation need to take into account co-occurring psychiatric conditions and concurrent and historical social challenges to most effectively improve mental health and functioning.

4. Maternal Depression in the Context of Home Visitation

4.1. Impact of Depression on Home Visitation

Qualitative studies have indicated that maternal depression is a challenging problem for home visitors. According to this research, maternal depression impacts service delivery and negatively affects outcomes. Based on focus groups with home visitors, (Stevens et al., 2002) found that home visitors and their supervisors identified maternal mental health problems as a significant barrier to providing home visitation services. Specifically, common themes emerged describing mothers with mental health problems as being more difficult to engage during visits and impinging on efforts to provide home visits in a consistent and continuous manner. This view was also echoed in the Early Head Start Research and Evaluation Project (Administration on Children Youth and Families, 2002) which stated that “program staff…regarded mothers with mental health needs as harder to serve” (p. 325). In another study, (Stevens et al., 2002) found that depressed mothers had more telephone contact with home visitors relative to their non-depressed counterparts even after controlling for self-reported social support and sense of personal control.

Lecroy and Whitaker (2005) surveyed 91 HFA home visitors regarding situations frequently encountered during home visitation that were found to be challenging. Mental illness was among the most frequently endorsed situations, with 78.5% of home visitors reporting that they had encountered it in the prior 30 days. Among the 15 most challenging situations, several were associated with mental illness in general and depression in particular, including “helping parents who threaten to commit suicide” and working with parents who are perceived as “uncommitted” or “unmotivated” (which may reflect misattributions of depressed mothers’ engagement). Tandon et al. (2005) found that 44% of home visitors believed that they were inadequately trained to help families with mental health problems.

Other research indicates that maternal depression may adversely affect home visitation outcomes. In the evaluation of Healthy Families Massachusetts, Jacobs and Easterbrooks (2005) determined that increased depressive symptoms were associated with fewer organizing and planning behaviors ($r = .36$), smaller peer social networks ($r = -.24$), higher

risk beliefs about parenting and knowledge of child development (r = −.18), and decreased parenting self-confidence (r = −.17). In the first year follow-up of the Healthy Families New York clinical trial, Mitchell-Herzfeld et al. (2005) found that mothers with relatively few symptoms (those scoring in the lowest 25% using the CES-D) who received home visitation were less likely to express attitudes endorsing physical punishment than controls, a finding not found for those with moderate and severe levels of depression. In contrast, mothers in the highest 25% of depression scores showed reductions in chronicity of psychological aggression in the intervention versus control groups.

The impact of depression on mother and child outcomes was extensively examined in the Early Head Start Research and Evaluation Project (Administration on Children Youth and Families, 2002). Eight sites participated and they reflected three approaches to administering the Early Head Start (EHS) program: center-based, home-based, and a mixed approach comprising both center and home service delivery elements. The short form of the CES-D was administered and mothers were divided into two groups based upon those with elevated (≥16, n = 617) or non-elevated levels (≤15, n = 658) at baseline. Comparisons were conducted between EHS and control mothers within these subgroups on a variety of measures of child and mother outcomes when the child was 3 years old. Although the moderating impacts of depression on outcomes yielded mixed results, most striking was the positive impact of the program on social-emotional behavior of children of depressed mothers in the observational assessments. In contrast to children of mothers with non-elevated levels of depressive symptoms at baseline, children of depressed mothers were more engaged during play and puzzle challenge tasks, were more persistent and able to sustain their attention, and were less negative in their interactions with mothers. Mothers with elevated depression at baseline also were more supportive and less detached with their children at follow-up play assessments and reported that they would use less severe discipline with their children. In contrast, mothers with non-elevated depressive symptoms had a lower proportion scoring below the clinical threshold on a test of receptive language and were more likely to read daily to their children relative to controls, findings not found in depressed mothers. Compared to mothers with non-elevated depressive symptoms, those with elevated symptoms were more likely to exhibit increased parent-child dysfunctional interactions with their children. Although non-depressed mothers in the EHS program increased participation in education and job training compared to controls, this finding was not found among depressed mothers.

One study went beyond a straightforward examination of the impact of depression on program outcomes and explored more complex interactions of depression with other variables. In an analysis of the Healthy Families Alaska evaluation, Duggan et al. (2009) reported the moderating influences of depression and attachment insecurity on maternal and child outcomes. At-risk mothers were randomly assigned to home visiting (n=162) or community services as usual (n=163) conditions, and families were followed until the child reached two years of age. Depression was measured at both time points using the CES-D. Baseline depression was associated with both attachment anxiety (concerns that others are not sufficiently invested in close relationships) and avoidant attachment (discomfort with interpersonal closeness and trust). Results revealed that outcomes were moderated by both depression and attachment insecurity in distinct ways. Depressed mothers receiving home visitation and with low to moderate levels of attachment anxiety showed improvements in sensitivity to child cues. Home visited mothers with lower levels of avoidant attachment had decreased depression at follow up, decreased intimate partner violence, and improved scores on the HOME Inventory. In contrast, mothers with higher levels of avoidant attachment experienced an increase in depression at follow up. Depressed mothers in home visitation with both high levels of attachment anxiety and avoidant attachment had an increased likelihood of substantiated child maltreatment. Taken together, these findings present a more

complicated picture of the role of maternal depression in home visitation than is typically described. They suggest that implications of depression for home visitation are dependent in part on the capacity of mothers to form healthy interpersonal relationships. Addressing the needs of depressed mothers in home visitation may require attention not only to mood management but also enhancing maternal abilities to establish close interpersonal relationships.

4.2. Impact of Home Visitation on Depression

It would appear that home visitation should lead to an amelioration of symptoms in depressed mothers. Characteristics of home visitors and service content create an environment conducive to recovery through a supportive relationship and alliance with the home visitor, reduction of stressful circumstances that may trigger or maintain depression, and teaching of problem-solving skills that promote self-efficacy. Many home visitors exhibit relationship building skills that are associated with effective psychotherapy, such as warmth, listening, and empathy. Although infrequently trained explicitly, such interaction styles are strongly emphasized in home visiting curricula. Home visitors are encouraged to be respectful, accepting, and nonjudgmental in their interactions with mothers. They help mothers think about and resolve problems, sometimes provide tangible assistance, and work with mothers to build social supports. Each of these is an ingredient found in many evidence-based psychological treatments for depression.

Yet, most research has found that home visitation imparts little to no benefit for maternal depression. Clinical trials of home visitation have typically found that, although depressive symptoms in many mothers decrease over time from the perinatal period through the first years of the child's life (a pattern consistent with naturalistic studies of postpartum depressive symptoms), home visitation and control groups do not differ over time. For example, in the evaluation of Hawaii's Healthy Start Program, Duggan et al. (2004) found no differences in depression (as measured using the CES-D) over three years of post-enrollment follow-ups between mothers enrolled in home visitation and controls. Similar results were obtained in the evaluation of Healthy Families Alaska (Duggan et al., 2007) in which, at two year follow-up, 17% of home visited mothers and 22% of controls had elevated CES-D scores ≥24 (adjusted odds ratio = 0.66, $p = .16$).

The clinical trial of Healthy Families New York (Mitchell-Herzfeld et al., 2005) reported changes in depression over the first year of service. Mean CES-D scores dropped over time in both the intervention (15.05 to 11.05) and control (15.73 to 11.61) groups although there was no significant difference between conditions ($p = .94$). A similar pattern emerged when groups were compared on the proportion of mothers scoring above the clinical cutoff. It was noted, however, that one of the three sites showed a positive impact on depression scores (the proportion of mothers in the elevated range dropped from 39.4% to 23.4% in the intervention sample vs. 37.7% to 38.2% in the control group). The authors posited that this finding was due to the fact that the site's supervisor "was trained as a clinical psychologist" and was able to offer home visitors more guidance, support, and education regarding depressed mothers.

In contrast, the Evaluation of Healthy Families San Diego (Landsverk et al., 2002) found a reduction in depressive symptoms in home visited mothers relative to controls. In this clinical trial, 488 mothers were randomized into home visitation (n=247) and controls (n=241) who received community services only. Families were assessed at baseline and again at three annual assessments. Using the CES-D, a significant Group × Time interaction ($p < .05$) was found. Specifically, mothers in the intervention group had lower mean scores at Year 2 relative to controls (13.2 vs. 14.4), a contrast that was non-significant at Years 1 and 3. This finding must be interpreted cautiously given the (1) relatively small effect size

which suggests that the clinical meaningfulness of the difference is modest, and (2) lack of continued benefits from Years 2 to 3.

The Early Head Start Research and Evaluation Project (Administration on Children Youth and Families, 2002) found no differences on maternal depression between intervention and control conditions by the end of the program (when the child reached three years of age). However, (Chazan-Cohen et al., 2007) reported a delayed but significantly positive impact of the EHS program on maternal depression at follow-up when the children were about to enter kindergarten. At three years of age, using the cutoff of ≥10 on the short form of the CES-D, 31.9% of mothers in the intervention group had elevated scores compared with 31.2% in the control condition. At kindergarten entry, this proportion shifted to 31.0% and 36.0% in the intervention and control groups, respectively. Further analyses revealed that reductions in maternal depression were primarily mediated by earlier improvements in child functioning. This suggests that over the long run, benefits to child functioning brought about by EHS eventually impact maternal mood. This is highly consistent with the bidirectional and transactional nature of child development and parent functioning in which both children and mothers influence each others' behavior in synergistic ways over time.

Using a novel approach, Bugental et al. (2002) conducted a clinical trial (n=96) of an HFA program that was augmented by a component addressing maternal attributions of children. Specifically, at-risk mothers in the enhanced condition received standard home visitation services but were also guided in the examination of causal attributions of their infant's behavior, followed by training in problem-solving. Mothers were encouraged to identify misattributions, substitute more benign and developmentally appropriate explanations for child behavior, and generate more effective and less harsh parenting responses. Although not specifically targeting depression, this cognitive approach contains elements of standard CBT treatment and would be predicted to have a beneficial impact on maternal affect. Mothers exhibited moderate levels of risk for child maltreatment, the interventions consisted of 20 home visits, and home visitation was provided by paraprofessionals. Maternal depression was measured using the BDI-II, and it was predicted that depression would mediate the relationship between condition and harsh parenting. Although mean scores on the BDI-II were not presented, results indicated that mothers in the enhanced condition experienced a larger drop in depressive symptoms relative to those who received standard home visitation or no home visitation (6.23 vs. 1.94). A partial mediation between depression and harsh parenting was found. The authors suggest that the drop in depressive symptoms increased maternal capacity for experiencing empathy, which in turn facilitated identification and modification of misattributions.

4.3. Synthesis and Methodological Issues

Research on the impact of maternal depression on home visitation and its outcomes has yielded conflicting findings. This is a small and non-definitive literature, and findings should be interpreted with caution. Qualitative studies have clearly documented that many home visitors are challenged by maternal depression, struggle to integrate responses to depression with the demands of implementing home visitation curricula, and desire more training to better prepare them for helping these mothers. Results from studies using quasi-experimental (Jacobs & Easterbrooks, 2005) and experimental (Administration on Children Youth and Families, 2002; Mitchell-Herzfeld et al., 2005) designs found that depression was related to both negative and positive outcomes in parenting, quality of the mother-child relationship, and maternal lifecourse. Integrating these findings is complicated by differences between studies in measurement of depression, clinical cutoffs used to categorize depressed and non-depressed mothers, timing of outcome assessments, measures of outcomes, and home visitation models. Despite these caveats, it is evident that the implications of maternal depression for home visitation are not uniform, and that home

visitation can have some beneficial effect on mothers and children even when mothers exhibit elevated levels of depressive symptoms. Duggan et al. (2009) elucidated the intricate ways in which depression influences home visitation, documenting its interaction with relationship style that have divergent consequences for home visitation outcomes.

Research on the impact of home visitation on maternal depression has yielded a clearer picture. With a few exceptions (e.g., Landsverk et al., 2002), home visitation appears to have few beneficial impacts on the manifestation or course of depression during the time of service. There are several reasons that depressed mothers are unlikely to experience significant symptom reduction during home visitation: (1) home visitors are not trained as mental health professionals; (2) home visitation curricula are primarily focused on education (i.e., expectations about child development), information (i.e., finding a pediatrician), modeling (i.e., how to attend to a child's needs), and linking mothers to other needed services (i.e., GED classes), rather than amelioration of depressive symptoms; and (3) given the scope of home visiting curricula there is insufficient time to adequately address mental health needs. Indeed, home visitors report that mental health needs, including depression, are among the most challenging problems that they face, and they typically report being inadequately prepared to address this problem (Lecroy & Whitaker, 2005; Stevens et al., 2002; Tandon et al., 2005). Moreover, although warmth and empathy are valued characteristics in care providers, and may partially contribute to an amelioration of depressive symptoms over time, they are not universally exhibited by all home visitors (Sharp, Ispa, Thornburg, & Lane, 2003) and are rarely formally targeted in training.

In contrast, Early Head Start (Chazan-Cohen et al., 2007) appeared to have a positive effect on maternal depression in the year following the end of services, a change driven by preceding improvements in psychosocial functioning in children. While this finding is encouraging it remains noteworthy that, during the first three years of life, children were exposed to maternal depression with all of the risks that these entail. Findings from (Bugental et al., 2002) suggest that modifying home visitation curricula to address, in a focused manner, an important dimension of parenting (maternal attributions) can positively impact maternal symptoms. This study provides evidence that home visitors, in the context of providing standard services, can lower maternal depressive symptoms provided they comprehensively address an area associated with depression.

There are several methodological issues that limit drawing firm conclusions from research on maternal depression and home visitation. Maternal depression is infrequently examined as a moderator or mediator, and it is unusual for maternal depression to be incorporated into a priori hypotheses derived from a clearly articulated theoretical conceptualization. Diagnostic manifestations of depression have not been examined, and it is unclear to what degree mothers with elevated symptoms met criteria for MDD. It is possible that the implications of depression for home visitation are different in mothers with elevated symptoms using a screen and those with MDD. Finally, there is a pressing need for replication of findings that show promise for helping depressed mothers and their children (Bugental et al., 2002).

5. Intervention Strategies for Maternal Depression in Home Visitation

Schreiber (2007) described results from a survey of home visitation programs as to how they addressed mental health, domestic violence, and substance abuse issues. Surveys were sent to 600 home visitation sites in the USA yielding a return rate of 50%. Although the three problem areas were not disaggregated, it was notable that 50% of programs either used consultants or separate professional staff as part of their service provision. None of the

programs provided systematic evaluation data regarding the effectiveness of their approaches.

Boris, Larrieu, Zeanah, Steier, and McNeill (2006) describe a mental health consultative and support component that augmented a Nurse-Family Partnership program in Louisiana. The program consisted of intensive training of nurse home visitors in mental health issues and placement of a Mental Health Consultant (MHC) with nurse home visitor teams. The MHC attended case conferences, advised nurse home visitors about how to conceptualize and address mental health concerns, and went on occasional home visits to observe and interact with mothers and children directly. Qualitatively, the authors reported that the MHC was well-accepted by the teams and seen as providing useful information and guidance. This is a promising approach, although in the absence of an empirical evaluation it is unclear if such a model provides direct benefits to mothers and children in the form of reduced depressed symptomatology and impairment.

Two investigative groups have examined direct provision of mental health treatment to depressed mothers. Ammerman and colleagues (Ammerman et al., 2007; Ammerman et al., 2005) developed In-Home Cognitive Behavior Therapy (IH-CBT), a treatment specifically designed for depressed mothers in home visitation. IH-CBT uses an evidence-based treatment—cognitive behavior therapy—that is adapted for setting, population, and context. Adaptations consist of: (1) implementation in the home setting, (2) content focus to address the unique needs of young, low income new mothers, (3) accommodations to the social issues and challenges faced by home visited populations (e.g., social isolation, trauma history, unstable housing, intimate partner violence), and (4) close integration and collaboration with home visitors and ongoing home visitation. IH-CBT is delivered by a trained masters level social worker who delivers 15 sessions of treatment followed by a booster session one month later. Integration with home visitation is achieved through frequent written and telephone contacts between therapists and home visitors to coordinate care, and a joint 15^{th} session in which the home visitor is in attendance. Ammerman et al. (2007) presented a case study using IH-CBT in which key elements of treatment and course were described, including use of standard CBT strategies to address depression, use of unique elements to facilitate acquisition of new coping skills, relapse prevention, and collaboration with the home visitor. Challenges in implementing treatment in a home setting were also reviewed, such as complications associated with intimate partner violence, addressing trauma history, and comorbidity.

Ammerman et al. (2005) describe an open trial of IH-CBT in which 26 first-time mothers receiving either the HFA or NFP home visitation model were enrolled using a two step process to determine eligibility. Mothers were first identified based on receiving a score of 20 or higher on the BDI-II, and obtaining a diagnosis of MDD using the PRIME-MD (Spitzer et al., 1994). Results indicated that 84.6% of mothers experienced full or partial remission of MDD at post-treatment, substantial reductions in depressive symptoms using the BDI-II, and increased functional status as reflected by the Brief Patient Health Questionnaire (Spitzer, Kroenke, & Williams, 2000). In a second study, Ammerman, Putnam, Stevens, Bosse, and Van Ginkel (2009) compared 64 home visited mothers who had completed IH-CBT with 241 mothers who met the same screening criterion of ≥20 on the BDI-II at enrollment and who were re-administered the BDI-II 9 months later. After controlling for demographic factors, comparisons between the two groups revealed a larger drop in BDI-II scores for treated vs. untreated mothers, despite the fact that untreated mothers had a longer amount of time in which to remit. Finally, Ammerman, Putnam, Altaye, Stevens and Van Ginkel (2009) reported preliminary findings (N = 71) from a randomized clinical trial of IH-CBT in comparison with “usual care” home visitation in mothers diagnosed with depression postpartum. Using mixed-model regressions, significant

reductions in depressive symptomatology were found at post-treatment based on self-report (BDI-II and EPDS) and independent clinical ratings (Hamilton, 1960).

Beeber and colleagues (Beeber, Holditch-Davis, Belyea, Funk, & Canuso, 2004) delivered Interpersonal Psychotherapy (IP; Weissman, Markowitz, & Klerman, 2000) to mothers enrolled in Early Head Start. Sixteen mothers were enrolled based on obtaining scores of 16 or higher on the CES-D and randomly assigned to receive IP or wait list control condition. Mothers had multiple children ranging in age from 1–5 years. In IP, treatment was delivered by a trained nurse who provided 8 in home weekly sessions followed by an 8 week period in which therapists were available by telephone (there was a median of 7 telephone contacts over this time). Administrations of the CES-D at three time points (pre-treatment, mid-treatment, and post-treatment) revealed substantial reductions in depressive symptoms for the treatment group (pre-treatment mean = 34.38 vs. post-treatment mean = 17.25) relative to the control condition (pre-treatment mean = 25.50 vs. post-treatment mean = 27.25). Beeber et al. (in press) replicated the treatment in a clinical trial with 80 newly-immigrated Latina mothers aged 15 years or older who were participating in Early Head Start. After meeting a criterion of ≥16 on the CES-D, mothers were randomly assigned to IP treatment or a “usual care” condition. Treatment was delivered by psychiatric nurses who partnered with a Spanish interpreter. Eleven sessions were provided by the team, and five additional boosters were administered by the interpreter. Results showed significant drops in self-reported depression in the IP relative to the usual care group that were maintained at one month post-treatment. Self-reported health moderated depression outcomes such that those mothers with poorer health benefited more than those adequate health. Maternal self-efficacy partially mediated the relationship between group and depression outcomes. No differences between groups were found on observational measures of the home environment and videotaped and coded interactions between mothers and children.

5.1. Synthesis and Methodological Issues

Although it has only been recently that maternal depression has been recognized as a significant problem in home visitation, it is encouraging that several approaches have been developed to address it. Judging from the Schreiber (2007) survey, many programs have made investments to counter maternal depression, or at least address mental health and related issues more generally. These range in intensity from programs that seek to support home visitors through training, providing home visitors with advice from mental health professionals about how to work with depressed mothers, providing brief services to depressed mothers in the context of home visiting, offering psychotherapy from therapists using non-specified treatments, to those who specifically adapt evidence-based treatment for use with home visiting populations in the home setting. Despite these varied approaches, the available evidence for specific approaches is absent or limited, and there is continued need for improved designs and methodologies.

One of the most common approaches appears to be providing home visitors with advice and support from trained mental health professionals. These typically include having mental health professional sometimes directly see depressed mothers, often briefly and with a specific dispositional goal in mind (e.g., assess symptom severity, encourage mothers to seek treatment). Such programs implicitly assume that (1) home visitors will be more comfortable working with depressed mothers if they have a mental health professional to talk to; (2) home visitors can learn ways of working with depressed mothers from mental health professionals that reduce mothers’ depressive symptoms, improve coping and functioning, and maximize impact of home visitation services; (3) depressed mothers and their children subsequently improve following these interventions; and (4) the cost-benefit is compelling. No empirical studies have been conducted on these approaches, and as a result it is impossible to ascertain whether any of these assumed outcomes are achieved through a

consultative/supportive model. Moreover, the conceptual foundation of the consultative/supportive approach is open to question. Studies suggest that home visitation alone is largely ineffective in bringing about changes in depression (at least during the course of services), and it is unclear how home visitors can learn complicated clinical skills that are sufficiently efficacious with depressed mothers through intermittent consultations. While consultative/support approaches may increase home visitor comfort and confidence with maternal depression, further research is needed to determine if benefits extend beyond these areas.

Two groups (Ammerman et al., 2005; Beeber et al., in press) have directly treated depressed mothers using evidence-based therapies implemented in the home setting. These are promising research efforts that seek to leverage two strategies with strong empirical foundations and adapt them to the unique challenges of home visiting populations. There are a number of differences between the two approaches in treatment used (CBT vs. IP), home visitation model (HFA, NFP vs. EHS), definitions of maternal depression (clinical diagnosis of MDD vs. cutoff based on self-report screen), race and ethnicity (Caucasian, African-American, Latina), therapist background (social worker vs. psychiatric nurse), number of children (first time mothers vs. multiparous mothers), and length of treatment (15 sessions + 1 booster vs. 8 sessions or 11 sessions + 5 boosters). Encouraging findings from preliminary research on these treatments suggest that both have the potential to become important additions to home visitation. Replication and more rigorous clinical trials are needed to establish their utility. Moreover, more in depth research is needed to further elucidate moderators and mediators of treatment outcome and relapse and recurrence of depression.

Beeber et al. (in press) found no treatment benefits on maternal interactions with children or quality of the home environment. This is consistent with (Forman et al., 2007), who reported that middle-class mothers treated for postpartum depression with IP showed few changes in parenting behavior or attributions about their children even when they experienced a reduction in depression. On the other hand, Gunlicks and Weissman (2008) reviewed multiple studies on maternal recovery from depression and subsequent impacts on children and concluded that improvements in depression often had beneficial consequences for parenting and child functioning. In home visitation, the issue is complicated by the fact mothers join these programs in order to acquire effective and nurturing parenting skills. Unlike more skilled mothers, in which depression may suppress learned parenting behaviors that re-emerge following recovery, those in home visitation may still display parenting deficits even when mood normalizes following treatment. Continued research is needed to explore the relationship between depression recovery and parenting behaviors in the context of home visitation.

6. Future Clinical and Research Directions

6.1. Measurement and Design

Given the ubiquity of maternal depression and its impact on child development, measuring depression should be incorporated into future evaluations of home visitation. Standard self-report measures are preferable to broad indicators of overall mental health. For studies specifically targeting clinical manifestations of depression, semi-structured psychiatric interviews to determine diagnosis of major depressive disorder should be considered. In terms of reporting of findings, future studies should be comprehensive in their presentation of data reflecting maternal depression. These include means and standard deviations for continuous measures of depression, even when data analytic strategies focus on bivariate analyses using clinical cutoffs.

Several studies have found that maternal depression affects home visitation in complex ways (Duggan et al., 2009). In addition, other research has yielded conflicting findings that are

difficult to explain. Going forward, the field would benefit from incorporating depression into theoretical models of home visitation outcomes and generating a priori hypotheses that are tested prospectively using rigorous designs. Such an approach will clarify the role of maternal depression in home visitation, and lead to adjustments in theory and home visitation approaches that are more elucidating and effective.

Evaluation of interventions requires rigorous clinical trial methodologies (Nezu & Nezu, 2007). These include reporting of subject recruitment and flow through the trial as stipulated in the Consort Statement (Moher, Schulz, & Altman, 2001), operationalized inclusionary and exclusionary criteria, use of appropriate control conditions, randomized assignment, blinded assessments, and intent to treat strategies in which treatment dropouts are followed and assessed. Studies should be adequately powered, report and appropriately address missing data, and use robust statistical approaches appropriate to randomized clinical trial designs. Adoption of these practices at this early stage of research will greatly accelerate our understanding of how best to treat and support depressed mothers in home visitation.

6.2. Intervention and Treatment

An increasingly popular approach to addressing maternal depression in home visitation is the establishment of supportive and consultative resources for home visitors and families. The appeal of such models is evident. Cost is likely to be lower than direct service approaches and in communities where trained mental health professionals are scarce, a consultative model can leverage limited resources to reach larger numbers of families. However, empirical evidence is lacking on whether such models directly benefit mothers and children. Such models sometimes include several visits with depressed mothers by mental health professionals. While these visits can clarify the extent and impact of psychopathology, they are not a substitute for the more intensive treatment that is typically required for major depression. Supportive and consultative models likely have a significant role to play, but more extensive research is required to establish the extent of its benefits and its limitations.

Providing evidence-based treatments (EBTs) are the most desirable approaches for depressed mothers in home visitation. Yet, there are numerous barriers to obtaining EBTs. In fact, only 57% of depressed adults obtain any treatment, and of these just 64% receive treatment that is deemed minimally acceptable according to evidentiary standards (Kessler et al., 2003). Such rates are certainly lower for low income mothers in home visitation (Lennon, Blome, & English, 2001). Numerous barriers impede access to mental health treatment, particularly for low income women. Even when center-based care is obtainable, clinicians trained in the use of EBTs may be unavailable. For example, Bledsoe et al. (2007) found that 62% of social work programs in the USA offered no training in EBTs. A recent study of psychologists found that many do not use EBTs, favoring approaches that fit their experiences and level of comfort (Baker, McFall, & Shoham, 2008). Community health centers (where most mothers in home visitation are likely to receive mental health services) have found that dissemination of EBTs is challenging (Morrison, 2004). Antidepressant medications, the most widely available EBT for depression, has been found to be less effective for women with trauma experiences (Nemeroff et al., 2003), a common feature of mothers in home visitation. In considering this state of affairs, it seems unlikely that the standard of care in home visitation—to link depressed mothers with mental health professionals in the community—will ever achieve desired levels of success. To this end, delivering treatments in the home setting appears to be the most promising approach to providing EBTs to depressed mothers in home visitation.

Treatment intensity must also be considered. While relatively brief treatments (4–8 sessions) may be appropriate for minor levels of depression or for populations with more extensive

social support and resources, the sociodemographically at risk women that participate in home visitation and who have more clinically severe manifestations of depression are likely to require longer and more intense interventions (15–20 sessions). Although it is tempting to reduce the number of sessions to decrease costs and allocate limited resources more widely, in the case of maternal depression this is likely to come at the expense of positive and sustainable outcomes for mothers and children.

It has been repeatedly documented that treatments developed and tested in highly controlled settings are less effective when implemented in real world settings (Weisz, Weiss, Han, Granger, & Morton, 1995). In response, several investigators have called for modifying and adapting treatments to accommodate the unique needs of populations and settings, preserving the core features of EBTs that contribute to recovery while improving feasibility, efficiency, engagement, cultural relevance, and effectiveness (Lau, 2006). Yet, such adaptations need to be made systematically and subjected to empirical study and that informal or untested alterations to treatment content and delivery run the risk of undermining intervention elements that are critical to efficacy. Depressed mothers in home visitation have a variety of unique features that necessitate adaptation to treatments. These include but are not limited to setting (home), sociodemographic risk (poverty, educational underachievement), cultural diversity, social resources, and clinical history (maltreated in childhood). In addition, ongoing home visitation represents an additional and concurrent intensive intervention that may augment and support or undermine efforts to treat depression. Taken together, design and evaluation of interventions for depressed mothers in home visitation needs to consider adaptations to therapeutic strategies, and to empirically examine the impact of such modifications (Ammerman et al., 2007).

Another option to address maternal depression is to train home visitors in evidence-based therapeutic approaches that they can use concurrent with providing home visitation curricula. Pfefferle, Cooper, Layton and Rohrbach (2009) describe the development of such an approach in which nurse home visitors implement a brief problem-solving intervention for depressed mothers participating in a Nurses for Newborns Foundation home visitation program. While the effectiveness of this and other related approaches await empirical testing, there are a number of potential challenges that warrant careful consideration. First, home visitors who are devoting time to provide therapy for depression during home visits will have less time for the implementation of home visiting curricula. This trade off may adversely effect home visitation outcomes, or require additional home visits. Second, because therapeutic skills are difficult to acquire and implement effectively and consistently (Sharpless & Barber, 2009), considerable investments in time and training may be required to bring home visitors to a required level of competence. Indeed, most training programs in psychotherapy are lengthy, require thorough grounding in a sizable empirical literature, include intensive clinical experiences with close and frequent supervision, and require demonstration of competency. In particular, recent views of psychotherapy emphasize strong skills in critical thinking and case conceptualization, both of which are challenging to master in the absence of intensive training (Friedberg, Gorman, & Beidel, 2009). That having been said, using home visitors to deliver treatment has appealing features that justify further empirical investigation.

7. Summary

The nascent field of maternal depression in home visitation has established a sufficient empirical foundation upon which several lines of programmatic research can be developed. It is established that: (1) depression is prevalent among mothers in home visitation, (2) home visitation services alone are insufficient to bring about substantial improvement in depression, (3) depression can mitigate the effects of home visitation, and (4) promising

approaches have been developed to treat maternal depression in the context of home visitation. Several questions are unanswered and there is a need for common approaches in measurement and design to facilitate replication and comparisons among studies.

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