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Maternal Depression and Childhood Aggression: Literature Review

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Abstract

Introduction—Childbearing depression (CBD) and childhood aggression are serious and international problems that encumber public health. Although maternal depression has received much attention in the literature in the last three decades, clinically it remains under-diagnosed and under-treated, especially during pregnancy. As a result, many mothers and families are left to suffer its long-lasting physical and psychosocial effects. This article's aim is to review the current literature on whether CBD increases the likelihood of childhood aggression in children ages six years and younger.

Methods—Using keywords, an electronic search was performed using Cumulative Index of Nursing and Allied Health, PsycINFO, and PubMed databases. Search limits included the following: *2000-2010, English, peer-review, human, All Child: 0-18*. From more than 2,000 search results, 13 articles were reviewed based on relevance to paper's inquiry and sample size greater than 50.

Results—In all, the articles agreed that depression in women increases the likelihood of early childhood aggression by causing negative parenting behaviors. However, this finding is tempered by a number of weaknesses in the quality of articles reviewed and by the complexity of the topic.

Conclusion—More research is needed to determine the etiology and interplay of mediating factors between CBD and childhood aggression. This could inform the study and implementation of effective and early prevention, screening, and treatment measures and programs for maternal depression and childhood aggression.

Keywords

maternal depression; childhood; aggression; depression; children

Depression remains the leading cause of disability worldwide and ranks the fourth leading contributor to disease (World Health Organization [WHO], 2011). While depression affects 121 million people worldwide of all genders, ages, and backgrounds, globally it is two times

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Websites

WHO: Maternal mental health & child health and development, http://www.who.int/mental_health/prevention/suicide/MaternalMH/en/

National Institute of Mental Health, <http://www.nimh.nih.gov/index.shtml>

Healthy New Moms, <http://www.healthynewmoms.org/>

Perinatal Depression Information Network, <http://pdinfonetwork.org/>

more prevalent in women than in men, with highest incidences occurring during childbearing years (WHO, 2011).

Childbearing depression (CBD) is generally defined as depression that occurs during and/or up to one year after pregnancy. It is also coined as maternal depression, perinatal/peripartum depression, and postpartum depression, although this last term is somewhat misleading in its implication that symptoms appear only after (and may be caused by) the partum event; in reality, they are often present throughout the pregnancy (Whiffen, 2004). CBD affects approximately 15.7% of women in the US (Centers for Disease Control and Prevention [CDC], 2008) and 13% of women worldwide (WHO, 2011). However, the actual prevalence is likely higher, as CBD remains under-screened, under-diagnosed, and under-treated. Other mood disorders that can affect childbearing women include the blues, a much more common and transient condition of mood fluctuations, anxiety, and irritability that has no known long-term consequences, and psychosis, a rarer and more severe condition that may be a manifestation of bipolar disorder. Psychosis may result in confused thinking, delusions, paranoia, and poor judgment (Gold, 2002; Pearlstein, Howard, Salisbury, & Zlotnick, 2009). Although both depressive and psychotic mothers are impaired in maternal interaction, only depressive psychopathology causes feelings of inadequacy, self-doubt, and negative cognitions that severely impair the maternal-infant bonding. Indeed, psychotic mothers do not have such thoughts and feel a good bond with their infant (Noorlander, Bergink, & van den Berg, 2008).

Several meta-analyses (e.g., Beck, 2001) have identified correlating risk factors for depression in childbearing women. These include but are not limited to poor physical health of a woman and/or her child, history of anxiety and/or depressive symptoms, stressful life events, relationship dissatisfaction or discord, unplanned pregnancy, and socioeconomic stressors, including poor socio-emotional support. Contrary to what some believe, depression identified during pregnancy is not that different from presentations occurring at other points in a woman's life. Both CBD and non-childbearing depression (NCBD) may have similar etiologies and cause loss of interest for at least two weeks as well as any of the following: sleep and appetite disturbances, low energy, hopelessness, diminished self-esteem, decreased ability to concentrate and make decisions, guilt, and/or suicidal ideation (Whiffen, 2004). Indeed, pregnancy and childbirth may simply serve as opportunities for the onset or re-emergence of psychiatric disorders in certain vulnerable women (Gold, 2002). Intervention and treatment programs must approach CBD and NCBD differently due to the added and unique duties, experiences, and challenges faced by a new mother and her family.

Significantly, CBD affects not only the depressed mother but also those around her. Adverse effects of CBD on the mother (e.g., risk-taking behaviors, birth difficulties, preterm delivery, reduced breastfeeding, dysfunctional maternal role) are accompanied by negative outcomes for the offspring and other family members. Detrimental effects on the child may include brain activity changes, failure to thrive, low American Pediatric Gross Assessment Record (APGAR) scores, elevated stress responses, increased emergency room visits, decreased well-child-care visits, insecure parent-child relationship (i.e., attachment and interactions), and developmental disturbances emotionally, cognitively, and behaviorally (Brand & Brennan, 2009; Goedhart et al., 2010; Leung & Kaplan, 2009; Marcus, 2009; Pearlstein et al., 2009). These negative effects indirectly affect the public, making CBD a public health concern (Almond, 2009).

Childhood Aggression

As stated above, CBD carries numerous deleterious consequences, including the potential for greater aggression in offspring. We define aggression in this paper as an expressed

negative and destructive emotion (e.g., expression of anger, frustration, and sorrow) in the form of directly or indirectly inflicted self-harm in addition to intentional or unintentional physical, verbal, and nonverbal acts that often result in injury, death, psychological harm, maldevelopment or deprivation (Blake & Hamrin, 2007; Liu, Lewis & Evans, In press; WHO, 2002).

Throughout early childhood, children learn important social skills, verbal and emotional expression, self-control, and coping skills. During this period, mild to moderate aggressive behavior such as shouting, name-calling, shoving, and jabbing is actually quite common; in fact, by 17 months of age, most children are physically aggressive toward siblings, peers, and adults (Loeber & Hay, 1997; Tremblay et al., 2004). Without a caregiver's encouragement, guidance, patience, and understanding, however, children may not develop the necessary skills to control these negative emotions. This can result in frequent and intense aggression or depression, as well as harm to self or others (Blake & Hamrin, 2007; Hage, van Meijel, Flutters, & Berden, 2009).

Childhood aggression is a well-known, strong predictor of future violence. Olweus (1979) reported an average correlation of 0.63 (0.79 after correcting for attenuation) between early aggression in childhood or adolescence and later aggression, and longitudinal studies have consistently documented that problem behavior in childhood is predictive of adolescent and adult behavior (e.g., Broidy et al., 2003; Farrington, 2003). In particular, it has been associated with alcohol and drug abuse, criminal behavior, academic failure, antisocial behavior, behavioral issues, depression, suicide, family dysfunction, domestic abuse, injury, neglectful and abusive parenting, and even death (Liu, 2004; Liu, Lewis & Evans, In press). A recent 40-year longitudinal study also showed that these negative outcomes tend to be more problematic for life-course-persistent aggressives (onset in early childhood) than late-onset (early adulthood) aggressives (Huesmann, Dubow, & Boxer, 2009).

Like CBD, youth aggression and violence poses a major public health concern around the world (Liu, 2011; WHO, 2002). While forms of violence are responsible for millions of deaths each year, how much of the visible, reported youth and/or adult aggression is directly or indirectly linked to maternal depression? This review aims to explore whether CBD increases the likelihood of aggression in children age six years and younger. Through analyzing the current literature and evidence, we hope to help bridge the gap between scientific literature and clinical practice in reducing CBD's negative outcomes in children.

Method

We conducted a literature search of the relationship between CBD and early childhood aggression using three databases: Cumulative Index of Nursing and Allied Health (CINAHL), PsycINFO, and PubMed. The search was limited to *English, peer-review, human, All Child: 0-18, and 2000-2010* and used a combination of the following keywords: aggression, antepartum, behavior, child, childhood, depression, maternal, perinatal, postpartum. More than 2,000 article titles and abstracts resulted from this literature search and were reviewed by one reviewer for relevance to maternal depression and childhood aggression. From this initial review, we selected to read 64 full-text articles by one reviewer with special attention to relevance to maternal depression and early childhood aggression (ages 0-6) and empirical studies with sample size greater than 50. On further analysis, we chose 13 articles to investigate this paper's inquiry: Does maternal depression increase the likelihood of early childhood aggression?. Table 1 provides a brief summary of the literature's characteristics.

Results

Among the 13 articles reviewed, we found evidence that when maternal depression exists, early childhood aggression is more likely to occur. But why and how does this happen? Most of the articles answered this question by focusing on disturbed parent-child relationships with regards to persisting negative parenting behaviors that disrupt the child's social, emotional, and/or cognitive functioning. The forms of negative parenting behaviors include emotional withdrawal, maternal intolerance and irritability, and parental hostility (Marchand, Hock, & Widaman, 2002). However, all of the articles agree that internal and external influencing factors mediate the relationship between CBD and early childhood aggression.

Emotional Withdrawal

Mothers with symptoms of CBD may lack warmth, sensitivity, and the ability to provide support and environmental structure for their children. These parental behaviors are collectively termed as withdrawn, passive, or disengagement parenting. Mothers with depression may have less vocal and visual communication, smile less, use longer utterances and less repetition, have more negative affect, and provide fewer explanations, suggestions, and questions (Herrera, Reissland, & Shepherd, 2004; Righetti-Veltima, Conne-Perreard, Bousquet, & Manzano, 2002). They may also touch their infants less frequently and in a less affectionate manner. In addition, mothers may participate less in enriching activities with their children, including reading, telling stories, singing songs, and playing games (Paulson, Dauber, & Leiferman, 2006).

By impairing face-to-face parent-child interactions, these behaviors create an insecure parent-child relationship that inhibits children's competency in social, cognitive-linguistic, and emotional skills, such as sharing, turn-taking, compliance, problem solving, effective verbal expression, and delay of gratification (Hoffman, Crnic, & Baker, 2006; Paulson et al., 2006). Consequently, this can lead to physical childhood aggression rather than verbal childhood aggression, as emotional dysregulation is expressed physically (Hipwell, Murray, Ducourneau, & Stein, 2005; Trapolini, Ungerer, & McMahon, 2007). In contrast, securely attached children are better equipped to express and regulate their emotions through language and are thus more likely to use verbal rather than physical means to express anger (Trapolini et al., 2007). Therefore, health care professionals should screen for parental emotional withdrawal and educate mothers on how to assist their children's emotional-behavioral development and discourage future tendencies for aggression. This can be done by actively encouraging children to identify and express their feelings verbally, develop problem solving skills, and resist acting on impulsivity.

Hostile Parenting

Maternal irritability and intolerance are some other symptoms of CBD and have been found to contribute to hostile parenting (Vando, Rhule-Louie, McMahon, & Spieker, 2008). These parental behaviors are collectively termed as authoritarian or intrusive parenting. Unsurprisingly, maternal irritability, maternal intolerance, and hostile parenting have been associated with insecure parent-child relationships and childhood aggression. Child conduct problems have been directly associated with parental hostile behavior in insecurely attached children and with maternal depression in securely attached children (Vando et al., 2008). In contrast, a study by Marchand, Hock, and Widaman (2002) found a difference that depended only in the age of the child. There, both CBD and parental hostile-controlling behavior were associated with externalizing behavior (e.g., conduct disorders, aggression, and delinquency) in four year-olds, but only parental hostile-controlling behavior was associated with externalizing behavior in six year-olds.

Mediating and Moderating Factors

How does insecure parent-child attachment lead to aggression? Some claim a multitude of social-contextual and personal factors mediate the relationship between insecure attachment and childhood aggression. In fact, Malik et al. (2007) developed a structural equation model predicting child aggression in Early Head Start families that accounts for 36.4% of the variance in early childhood aggression. In their study, poor maternal mental health (e.g., depression, parental distress), family interactions (e.g., family conflict, punishment, relationship dissatisfaction), and partner support were all directly associated ($p < .05$) with early childhood aggression as individual risk factors, but other possible confounding variables were not explored. A study by Carter and colleagues (2001) investigated depressed mothers with and without comorbid anxiety, substance use, or eating disorders. Mothers with comorbidities had less optimal play interactions with their child at 4 months, with 80% of them classified as insecure attachment at 14 months, than depressed mothers without comorbidities. In another study, maternal child-rearing practices, personality attributes, and drug-use were shown to have important influences on toddler aggression (Brook, Zheng, Whiteman, & Brook, 2001). In particular, they hypothesized that drug use was associated with parental aggression and other negative parenting behaviors, leading to insecure mother-child bond.

Some articles we reviewed also considered gender as a contributing factor. One study found boys were more likely to use physical aggression while girls were more likely to verbalize their aggression, with parental discord and behaviors having more of an effect than maternal depression (Hipwell, et al., 2005). Moreover, maternal depression indirectly predicted child aggression through its association with parental emotional detachment and parental conflict. Another study reported a stronger association between lower levels of externalizing behaviors and parental warmth in boys than in girls (Kerr, Lopez, Olson, & Sameroff, 2004), and other research suggests that boys are more vulnerable to insecure attachment (Carter, et al., 2001). Additionally, Blatt-Eisengart and colleagues (2009) found boys and girls to be sensitive to maternal depression at different ages—specifically boys at 24 months of age and girls at age 6. The authors did not, however, discuss a rationale for these findings.

Appraisal

Our review of the literature found collective affirmation that CBD increases the likelihood of early childhood aggression. However, based on our assessment of the quality of the reviewed studies, the evidence linking CBD to childhood aggression should be considered limited and inconclusive. Not only does the etiology still remain unclear, but the chosen peer-reviewed journal articles did not adequately consider or investigate internal and external contributing factors. In particular, the following still need to be thoroughly considered: culture, gender, developmental age of the child, child abuse, violence and aggression exposure, the age of exposure to CBD, parenting styles, CBD and/or child aggression treatment received, protective factors, and the level of severity and course of CBD exposure (Seifer, Dickstein, Sameroff, Magee, & Hayden, 2008). In fact, the best predictor of the impact of maternal depression on the family unit is the course and severity of maternal depression (Seifer et al., 2008), but only 2 of the 13 articles reviewed even attempted to evaluate this essential influencing factor. Moreover, none of the 13 articles controlled for protective factors for the mother or her child, such as coping strategies, good health, optimism, a social support system, and community resources. Therefore, while there is consistency across the literature that maternal depression is a risk factor for childhood aggression, there remains a large number of contributing factors that require further investigation.

In addition, we found wide variations in the definitions and use of measurement tools for maternal depression and child aggression (Table 1). Only 2 of the studies used the Edinburgh Postnatal Depression Scale (EPDS), a valid instrument that relies less on somatic questions because it was specifically developed for the context of pregnancy. It has been found to be significantly more reliable and predictive than other general screening instruments, including those used in many studies we reviewed (e.g., BDI, CES-D), when used in pregnant women (Sharp & Lipsky, 2002). Furthermore, most articles relied on broad child behavior assessment tools and subjective reports (i.e., self-reports) from mothers about their depression and their child's behavior. As depression, upbringing, culture, and embarrassment can influence the mothers' responses, more objective assessments should be used in future studies.

There were also some discrepancies in the studied populations being qualitatively and quantitatively different and therefore non-generalizable. Furthermore, only 4 of the 13 articles were conducted outside of the United States. More longitudinal studies with larger and more diverse samples are needed to examine the pathophysiology and influencing factors separately by gender, developmental age, and culture to determine the complex interrelationships of internal and external factors while controlling for confounding variables.

Clinical Implications

Worldwide, health care providers are at the frontline of intervening on client behaviors and functioning. They can assist with the implementation of primary, secondary, and tertiary CBD prevention programs focused on prenatal and perinatal periods. The results of our review provide several targets on which such programs can focus.

Primary prevention includes health promotion where health care providers teach pregnant and lactating women about the prevalence, symptoms, possible risk factors, and consequences of CBD. Health care providers can also educate mothers about the process of infant growth and development and proper prenatal/postnatal care (Liu & Wuerker, 2005). Providing support groups during pregnancy can significantly improve maternal and child outcomes considering the importance of a mother's satisfaction with social support during pregnancy (Collins, Dunkel-Schetter, Marci, & Scrimshaw, 1993). In a similar vein, although evidence on the effect of a father's support on child behavioral outcomes in the presence of maternal depression is sparse and inconclusive (e.g., Letorneau, Duffett-Leger, & Salmani, 2009; Mezulis, Hyde, & Clark, 2007), cooperation and communication between parents are an important consideration. Maternal satisfaction with father involvement, not actual degree of his support, may be more critical to mediating a child's behavioral outcomes (Fagan & Lee, 2009).

In terms of secondary prevention, health care providers can screen for depression using reliable tools such as the EPDS or newer Postpartum Depression Screening Scale (PDSS), both of which are designed specifically for pregnant women, highly reliable (Beck & Gale, 2003), and also valid in the antenatal period (e.g., Bergink et al., 2011; Pereira et al., 2010). Providers should also look for associated risk factors (e.g., poor mental health, substance abuse, socioeconomic stressors, lack of social support), especially in high-risk populations such as low-income families and pregnant teenagers. Additionally, since the co-occurrence of paternal and maternal post-partum depression significantly increases the likelihood that children will exhibit behavioral problems (e.g., Paulson et al., 2006), fathers may also be screened when women are at risk for CBD. In terms of tertiary prevention, health care providers can aid in administering treatments, such as pharmacotherapy, psychotherapy,

cognitive-behavioral therapy, proactive behavior strategies, and education remediation programs (Liu & Wuerker, 2005).

If providers are not equipped with the knowledge, assessment tools, education, and experience, CBD will continue to be under-diagnosed and under-treated. Health care providers should continue their education by reviewing the state of the science and literature in their designated field to ensure quality care to their clients and the public. However, even with educated and willing health care providers, the process is complicated by limitations in time, resources, and staffing, mental illness stigmas, and client denial due to feelings of guilt and embarrassment. Importantly, CBD can even inhibit parents from successfully processing and applying recommendations made by their healthcare provider (Paulson et al., 2006), such as taking their children to well-child visits and receiving vaccines (Minkovitz et al., 2005). Thus, although much attention is given to depression appearing in the postpartum period, health care providers need take more responsibility for the identification of depressive symptoms in mothers at the earliest opportunity.

Beyond clinical practice, our results also have important implications for education and policy-making bodies. Academic institutions play a fundamental role in educating practitioners on the importance of this issue and have a responsibility to ensure consistency between the state of the research and the clinical skills (e.g., assessment skills, effective screening tools, evidence-based treatments) they disseminate to students. Additionally, policy-making bodies create standards of care and can help promote use of screening, prevention, and treatment programs (Liu, 2011). This ensures that standards and programs are taught to health care providers, thereby improving the overall health of the public.

Future Research

Although CBD appears to impact aggression in early childhood, the current evidence is still limited. Research in this area remains difficult due to its complexity. First, respondent bias is a consideration as depression, embarrassment, self-denial, culture, upbringing, and mood may affect reporting. Therefore, researchers should use objective evidence-based screening tools to evaluate respondents, especially those specifically made for pregnant women (e.g., EPDS, PDSS). Second, stigma against psychological illnesses remains an issue in today's society and may cause reluctance to participate in such research. Researchers should clearly review IRB and consent agreements with patients, assuring respect of their confidentiality and explaining the importance of honesty. Third, future studies need to better examine and account for numerous potential factors that influence maternal depression and aggression, such as culture, exposure to violence, and degree of depression (Seifer et al., 2008). Finally, methodology and design of future studies can be improved by using large, diverse populations, universal definitions of depression and aggression, and consistent, objective assessment tools for CBD and childhood aggression. With more research, prevention and treatment interventions for CBD and childhood aggression can be improved and implemented globally.

Depression and aggression are treatable phenomena that are influenced by genetic, environmental, social, psychological, and/or biological factors (Hipwell et al., 2005). It is imperative that public health efforts worldwide aim to increase awareness of CBD's prevalence, risk factors, treatments, and consequences. A multidisciplinary approach can enhance our understanding of the etiology, pathophysiology, and contributing factors of maternal depression on child outcomes. In turn, this approach can aid in the development of effective interventions to screen and treat CBD, thereby preventing and dampening its detrimental effects.

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Callouts

1. Maternal childbearing depression (CBD) is an under-reported and under-treated problem around the world.
2. Childbearing depression has well-established, serious and long-lasting effects on the entire family unit.
3. Maternal depression is a risk factor for childhood aggression, but there remains a large gap in understanding the contributing factors.
4. Mediating factors such as substance use and child gender can provide insight into how insecure parent-child attachment leads to aggression.
5. More research on the relationship between CBD and childhood aggression is needed to more effectively prevent and decrease CBD's detrimental effects.

Suggested Clinical Implications

- Although commonly diagnosed in the postpartum period, depression can affect pregnant women throughout pregnancy and contribute to negative child outcomes.
- Pregnant and lactating women should be educated about CBD and provided with additional educational and support groups to help them prepare for parenthood.
- Healthcare providers should try to identify depression as early as possible through routinely screening for depression in childbearing women (using valid measures such as the EPDS and PPDS, which are specific to the experience of pregnancy and reliable in both ante- and postnatal stages).
- Health care providers should assess for the presence of significant risk factors for CBD, such as poor mental health and psychosocial issues.

Table 1

Summary of Literature Characteristics

| Author | Methods | Population/Setting | Variables | Measurement Strategies | Child's age |
|-------------------------------|---|---|---|---|--|
| Blatt-Eisengart et al. (2009) | Longitudinal prospective cohort study (follow from 24 months of age to age 6), cross-sectional | 1,364 diverse mother-child dyads from 24 hospitals in 10 sites across the US | Positive and negative parental behaviors, Maternal depression, Child externalizing behaviors, Child gender | CBCL, Observation of maternal behavior, Raising children questionnaire, CES-D | 24 m.o. and 6 y.o. |
| Brook et al. (2001) | Cohort study | 254 non-diverse mother-father-child triads from a previous longitudinal study in Upstate NY | Parental drug use, Parental aggression, Parental child-rearing techniques, Parental marital relations, Toddler aggression, Child gender | 2 hour structured questionnaire/interview by trained interviewer | 2 y.o. |
| Carter et al. (2001) | Longitudinal prospective cohort study (follow from pregnancy to 30 months postpartum) | 69 non-diverse mother-infant dyad from a mid-sized northeastern city in the US | Maternal depression, Maternal emotional availability, Attachment, Infant toddler social and emotional, Child behavior (internalizing and externalizing), Child gender | CES-D, Structured Clinical Interview for the DSM-III-R-non-patient, EAS, Traditional Ainsworth attachment classification and newer D classification, ITSEA, CBCL | 4 m.o., 14 m.o., and 30 m.o. |
| Herrera et al. (2004) | Cohort study, Randomized, Controlled | 72 Caucasian Mother – infant dyads from the Grampian area of Scotland (UK) | Demographics Maternal and infant touch, Maternal and infant vocalization, Maternal speech, Infant gender | Questionnaire, EPDS, Observer Coding System (videotaped) | 6 and 10 m.o. |
| Hipwell et al. (2005) | Longitudinal prospective cohort study (followed from 20 m.o. to 5 y.o.), naturalistic, randomized | 94 mother-child dyads from a community sample (UK) | Mother-child interaction, Maternal depression, Psychiatric history, Parental conflict (life events, difficulties schedule, parental discord), Parental cooperation, Peer play, Child gender | Videotaped mother-child interaction, SADS-L, LEDS, DAS, Time and event sampling to examine the quality of the peer play | 20 m.o. and 5 y.o. |
| Hoffman et al. (2006) | Longitudinal, prospective cohort study, Cross-sectional | 208 diverse mother-father-child triads from an ongoing longitudinal study at multiple sites in Central PA and Southern CA | Demographics, Health history, Maternal depression and scaffolding, Child's behavior and emotional dysregulation, child cognitive status, Child gender | Questionnaires, Maternal Scaffolding Coding System, CBCL, Dysregulation Coding System (problem-solving, cleaning up, and waiting tasks), CES-D, Structured laboratory visits (videotaped) | Assessments: between 0-6 m.o. and 3-4 y.o. Lab visits: between 5-7 and 47-49 m.o. |
| Kerr et al. (2004) | Cross-sectional, cohort study | 238 parent-child from a community sample (unreported city) Subsamples: -158 fathers -189 preschool teachers | Demographics, Child behavior (internalizing, externalizing, child restraint) Moral regulation, Discipline and parental behaviors, Child gender | Questionnaires, Laboratory assessment, CBCL/2-3, CTRF/2-5, Gift task, Active Moral Vigilance/Regulation scale, PDI | 3.5 y.o. |
| Malik et al. (2007) | Cross-sectional, cohort study | 270 diverse mother-father-child triads from five Head Start | Demographics, Parental depression, Parenting stress, Child aggression, Family | Questionnaires, CES-D, PSI-SF, CBCL, FES | Between 12-43 months of age |

| Author | Methods | Population/Setting | Variables | Measurement Strategies | Child's age |
|--------------------------------|--|---|---|--|--|
| Marchand, et al. (2002) | Longitudinal prospective cohort study (followed from age 4 to age 6) | Community sample of 51 mother-child dyads from an unspecified US metropolitan area | environment (family conflict, Punishment, Partner support, Relationship satisfaction, Family stability), Socioeconomic status | | 4 and 6 y.o. |
| Paulson et al. (2006) | Cohort study, Cross-sectional | 5,089 parent-infant dyads from the Early Childhood Longitudinal Study Birth Cohort (US) | Maternal depression, Mothers' hostile-controlling behavior, Children's externalizing and internalizing behaviors | CES-D, HOME, CBCL, Unstructured play, Eich-A-Sketch toy, semi-structured interview | Infants |
| Righetti-Veltema et al. (2002) | Longitudinal Prospective cohort study, Random, Cross-sectional, Naturalistic | 570 women from University Maternity Hospital and a private antenatal preparation center (Switzerland) | Demographics, Parental depression, Health behaviors, Parent-child interactions, Child gender | Questionnaires, CES-D, Interviews | N/A |
| Trapolini, et al. (2007) | Longitudinal prospective cohort study | 92 mother-child dyads from the Parent Craft Centre (Australia) | Demographics, Perinatal data, Maternal depression, Psychological characteristics of mother, Mother-infant relationship | Questionnaires, EPDS, Home assessment and interview | Women seen during 3 rd trimester and 3 months after pregnancy |
| Vando et al. (2008) | Longitudinal prospective study | 84 adolescent Caucasian mother-child dyads from the Early Parenting Project (Seattle, WA) | Maternal depression, Attachment classification and representations, Child cognitive development | CIDI, CES-D, Strange situation procedure (videotaped), ASCS (videotaped with transcripts), Wechsler Preschool and Primary Scales of Intelligence | 4, 12, and 15 m.o. and 4 y.o. |
| | | | Infant attachment, Maternal depression, Hostile parenting, Child conduct problems, Child gender | BDI, Strange Situation, 3 structured Parent-child interaction tasks (Child's Game, Parent's Game, and Clean Up), CBCL | 1, 4, and 6 y.o. |

CBCL = Child Behavior Checklist, CES-D = Center for Epidemiological Studies Depression Scale, EAS = Emotional Availability Scales, ITSEA = Infant-Toddler Social and Emotional Assessment, EPDS = Edinburgh Postnatal Depression Scale, SADS-L = Schedule for Affective Disorders and Schizophrenia-Lifetime, LEADS = Life Events and Difficulties Schedule, DAS = Dyadic Adjustment Scale, CTRF/2-5 = Caregiver/Teacher Report Form, Ages 2-5, PDI = Parenting Dimensions Inventory, PSI-SF = Parenting Stress Index-Stress Form, FES = Family Environment Scale, HOME = Home Observation for Measurement of the Environment, CIDI = Composite International Diagnostic Interview, ASCS = Attachment Story Completion Task, BDI = Beck Depression Inventory.