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Cognitive Behavioral Development in Children Following Maternal Postpartum Depression: A Review Article

Hamid Mirhosseini[1], Seyed Ahmad Moosavipoor[2], Mohammad Ali Nazari[3], Ahmad Dehghan[4], Sara Mirhosseini[5], Reza Bidaki[6], Pouria Yazdian-anari[7]

[1] Ph.D. in Cognitive Neuroscience, Assistant Professor, Research Center of Addiction and Behavioral Sciences, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
[2] Pharmacologist, Faculty Member, Department of Pharmacology, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
[3] Ph.D. in Cognitive Neuroscience, Associate Professor, Department of Educational Science and Psychology, Tabriz University, Tabriz, Iran
[4] General Physician, Managerial of Emergency Department, Faculty of Medicine, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
[5] Medical Student, Student Research Committee, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
[6] Psychiatrist, Associate Professor, Department of Psychiatry, Rafsanjan University of Medical Sciences, Rafsanjan, Iran
[7] Medical Student, Student Research Committee, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

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Abstract

Mothers' constitute is a very important part of infants' social environment and mediate their experience with the surrounding world. Postpartum depression, which is considered one of the most common and important psychiatric disorders, affects 10-15% of mothers, its causes are different. By investigating various sources, some effects of this disorder have been observed on the cognitive development of children, particularly among boys, such as language, intelligence quotient (IQ), and behavioral problems. Thus, it is imperative to study the effects of postpartum depression on children's growth and development and to identify methods of reducing these effects. This review indicates that postpartum depression in mothers reduces children's cognitive performance. The adverse effects of postpartum depression on children's development seem to be mediated by the mother's interpersonal behavior and the infant gender. The review of previous studies shows that postpartum depression reduces children's cognitive performance by impairing maternal mental and behavioral care.

Keywords: postpartum depression, intelligence quotient, cognitive development, behavioral Development

1. Introduction

About 100 million babies are born each year, and about 40% of them have mothers who have mood disorders. The prevalence of postpartum depression is estimated to be 10-15% (1-5). Postpartum depression affects approximately 10-15% of women and it is a public health problem that affects mothers and their families about 10-15% (1-5) and it is a public health problem that affects mothers and their families (6). Since mothers have a dominant role in their children's social environment development, it is necessary to research on the effects of this disorder on children's growth and development. The maternal postpartum depression adversely affects the quality of child care (7). Recent studies have suggested that this disorder has significant effects on children's subsequent growth and development (8). In this paper, cognitive development and behavioral problems in children (e.g., sleep disruptions, crying, and temper tantrums) are reviewed.

Corresponding author:
Associate Professor Dr. Reza Bidaki, Rafsanjan University of Medical Sciences, Rafsanjan, Iran.
Tel: +98.3434260080, Fax: +98.3434260086, E-mail: reza_bidaki@yahoo.com
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Studies conducted during the last 20 years were included in this review, and we explored various terms associated with postpartum depression, such as baby blues, postpartum sadness, obstetric disorders, child development, crying, and behavioral and cognitive development. We searched several databases, including Psycinfo, Medline, Embase, Google Scholar, ProQuest, and Scientific information database (SID).

2. Discussion

2.1. Cognitive development

Murray et al. have published five series of studies concerning child cognitive development. They studied the postpartum period and child development in Cambridge and in maternity hospitals in the United Kingdom from 1986-1988. The subjects considered in this study were primiparous women in the age range of 20-40 who lived with their husbands, had 37-42 weeks of pregnancy, were treated by primary care, and lived in the same area up to 18 months postpartum. Six weeks after the delivery, the mothers completed the Edinburgh postnatal depression scale sheets. Those who scored higher than 13 were considered to have postpartum depression, and, about 2-3 months after the delivery, they were interviewed and assessed by psychiatrists. The aim of the interviews was to determine the mother's childhood and family relationships with parents and spouses, obstetric history, life events, economic situation, and personal perspective about pregnancy and having a child. The level of care was not related to previous psychiatric illness history or the infant's gender (9-14). The first study examined the effect of postpartum depression on the child's Piaget's object concept, tasks at 9 and 18 months, and the Bayley and Reynell scales at 18 months. The children of mothers with previous history of postpartum depression (not the recent depression) most likely had no understanding of objects up to 9 months, and the children of mothers with postpartum depression or a previous history of depression were more likely to fail in understanding the object concept up to 18 months. Girls performed better than boys in general, which was often associated with maternal education or economic condition. Bayley and Reynell's scores did not show the effect of depression, but social class was a significant factor. Thus, lower social class had negative effects on children's intellectual and language development (9). Niloufer et al. claimed that mother's postpartum depression and anxiety influence children's mental development. They reported five subscales of children's delayed mental development on five subscales, i.e., socio emotional, language, cognitive, gross motor, and fine motor development. They found a positive impact on the child's cognitive development if the mother were older when the child was born. However, they also found that there were adverse effects on the child's emotional wellbeing if the mother were older when the child was born. The children's stunting as a result of their mother's depression adversely impacted the children's development on all five developmental subscales. There was less of an adverse impact on female children than on male children with respect to delays and retardation in learning language and the development of gross motor skills (10). Quevedo et al. conducted a study in which it was found that children were at higher risk of impaired language acquisition at 12 months of age if their mothers had postpartum depression (11). Chu et al. found that children had increased difficulty in learning the meanings of words and increased behavioral issues that were directly related to the severity and duration of maternal depression (15). Children whose mothers were older and who had two or more siblings were more likely to have problem in language development Since younger mothers tend to be more interactive with their children, older mothers may have an adverse influence on the pace at which the child learns language (15). Murray et al. reported that a child's poor cognitive development can be related to the mother's chronic depression (14). McLearn et al. also reported that children have relatively poorer cognitive and social-emotional outcomes and relatively more behavioral problems when their mothers had anxiety and/or mood disorders (16). Recently, Kingston et al. conducted a systematic review in which they expressed that the mothers' postpartum distress can delay infants' cognitive and socio-emotional development during the first 12 months of life (17).

Another study investigated the impact of the mother's speech with infant during playtime on the infant's cognitive development at 2, 3, 9, and 18 months. Also, gender of the infant was taken into consideration. A 5-min video was recorded of the mothers as they played with their infants, and the video was coded according to the complexity of the mother's speech in terms of duration of speaking, continuous repetitions, description continuum of the coordination terms, and reciprocity (i.e., the infant's, the mother's, and any other statements were noted) (18). Talking to infants 2-3 months after delivery had a more direct influence than doing so 9 months after delivery, but the effects were less than those at 18 months. The results at 18 months were predicted by the mother's performance at 9 months (Girls showed more improvement than boys in this period) (19). The speech of mothers with postpartum depression with male infants was less infant-focused than other groups of mothers, and it also had a more negative impact. After the separation of mothers recently diagnosed with depression, most of the mother's infant-focused speech at two months was associated with the mothers' having higher scores on Bayler's intellectual development

scale when their infants were 18 months. Although maternal depression was not associated with the absence of the object concept at 9 months, significantly but this effect was observed at 18 months. The children of mothers who didn't meet criteria for postpartum depression showed a greater success rate than the children of mothers with postpartum depression, and the female infants had a higher success rate with the object concept tasks than the male gender (18, 20-22). In other study that was conducted for more than a 5-year period found no relationship between maternal postpartum depression and child cognitive performance. However, another study that examined the relationship between postpartum depression, the child gender, and cognitive development, showed that the male infant's mothers with postpartum depression performed better on Bayler's scale than the male infants whose mothers had postpartum depression, considerably. About female infants, there was no meaningful difference (22).

The speech of mothers with postpartum depression who had a son was more infant-focused than the speech of mothers in other groups, and it had more negative effects. Mothers' infant-focused speech in the first two months was not associated with the Bayler's scale rating over 18 months, but significant effects were observed at 18 months. Regarding to the object concept task, the female off-springs of mothers whom suffer from postpartum depression had a better performance than the boys (18). Another study by Murray et al. found no relationship between maternal depression and children's performance on cognitive function at any time. However, children's performance can be related to early maternal interactions that were insensitive, maternal motivation, and social class (19). In another study on the relationship between postpartum depression and the infant's gender and family's social class, there were two behavioral activity indices. Stressing out and behavioral disorders in boys with mothers who had postpartum depression were related to high scores of activity scales, while the girls with mothers who had postpartum depression had the same score as the healthy control girls. Considering the capabilities of getting distressed, the boys of mothers with postpartum depression and from a lower social class were at a higher level of this domain. However, the girls' capabilities in getting distressed depended on lower social class and having a mother who did not have postpartum depression. Finally, considering behavioral disorders, the sons of mothers with postpartum depression had higher scores, and the daughters of mothers with postpartum depression had lower scores. The boys and girls in the control group had similar intermediate scores (23). Effective performance of the daughters of mothers with depression can cover up mental health problems that have not been diagnosed. Also, the association between postpartum depression and the problems of sending boys to school are not yet known (24). Children whose mothers were depressed during the children's first year of life had relatively lower Global Competitiveness Index (GCI) scores than children whose mothers were not depressed during that time. Also, depression during pregnancy or within four years postpartum affected the McCarthy valuation of the child's performance (25). Boys of mothers with postpartum depression scored significantly more poorly on perceptual, motor, and verbal abilities than daughters of mothers with no postpartum depression (especially, boys whose mothers were depressed at one year postpartum). Postpartum depression, mother and child interactions, and home environment were identified as determinants and predictors of children's cognitive development (26). The vocabulary development score was not related significantly to the timing of a mother's depression, but it was related to the intensity and duration of the depression. However, maternal education and severe, chronic depression had significant effects. Thus, there is no relationship between the child's cognition and the duration and onset of maternal depression. However, poorer cognitive functioning is expected by early experiences of insensitive maternal interactions, household stimuli, and social class. For boys, the number of months they spent at school also is important (27). In a prospective study, Murray assessed teachers' ratings of children's behavior with history of mother's postpartum depression in the first five years. Postpartum depression was not associated with school preparation, personal maturity, social behavior, ability to harmonize, or the sensitivity and stability of the child (24). In a study conducted by Hay et al., 204 families with newborn children and adverse socioeconomic levels were studied for four years. This study illustrated the relationship between postpartum depression and infants' cognitive development. The results showed that boys whose mothers were depressed were in poorer cognitive, language, and mobility conditions on McCarthy's 1972 scale than girls or children whose mothers were healthy. The differences in cognitive abilities depended on postpartum depression, behavioral problems (based on parent reports), weight at the time of birth, parents' IQs, family situation, home environment, mother-child relationships, and breastfeeding during the neonatal period (26). Postpartum depression and other factors, including the home environment and the mother's behavior, were found to determine the level of cognitive development of children. Analysis of the data supported the fact that the boys' cognitive delay was connected totally with their mothers' postpartum depression. Infants with low birth weight and infants of mothers with low education were more susceptible to having delayed cognitive development (26). A sample of 1329 mothers with just one child was selected randomly considering infants' sex and low socioeconomic level. Ninety-two mothers with postpartum depression were selected, and 721 healthy mothers served as the control group. Also, no specific relationships were found between infant's gender, birth risk ratio, as

well as socioeconomic status and depression. This study showed no effect of the intensity, duration, or frequency of the depression on the child's development. However, long-term depression was associated with child gender (28). Brennan et al. studied 5,000 children and their mothers. Cognitive performance was assessed by the Peabody Picture exam. The vocabulary development score was not related particularly to maternal depression, but it depended on the duration and intensity of the depression and the mother's educational level. Also, long-term depression was a key factor (29, 30). Children's behaviors at 5 years postpartum were investigated in a prospective study that was conducted by Murray. Coordination and congruity between parents at home (maternal and paternal attitude on behavior or parenting) was reported to be high (0.70). This effect was still indefeasible, even after controlling and scrutinizing attachment security, the child's gender, parental conflict, and socioeconomic level. In the school environment, physical play (i.e., playing with sand and water) was related significantly to the mother's postpartum depression, because children of mothers with postpartum depression were more inclined than the children of healthy mothers to participate in these games rather than in games related to creativity. These types of games often originate from the enthusiasm that is generated by physical experiences. The children's interactions with the teacher were not related to their mothers' postpartum depression (31). A longitudinal study of women and their behavior showed the direct effects of postpartum depression on their children's behaviors. These results were obtained from 70 mothers and their children, and they showed that the child behavior checklist (CBCL) scores, regardless of maternal postpartum depression, were close to those of the normal children. The postpartum depression was related directly to the mothers' subsequent depression, but, it did not depend on the children's behavioral problems. Based on a small sample children who were 4.5 years old, it was found that children's behavioral problems were related only to their mothers' current depression (32). In 2015, another study of pregnant women at 33-36 weeks into their pregnancies and five weeks postpartum showed that the mothers who had symptoms of postpartum depression had infants whose crying duration and frequency were much greater than the infants whose mothers had no depression. Postpartum depression can alter mothers' perspective toward their babies' crying (33).

2.2. Crying and motor behavior

The Studies have shown that postpartum depression can affect the baby's crying, but it has no effect on the activity level (29). The most comprehensive studies of the long-term effects of postpartum depression on children's performances on cognitive tasks at 18 months showed that children of mothers with postpartum depression performed more poorly than the children of healthy mothers. These results were more pronounced in boys than in girls. This effect was mediated by interaction and communication between mother and child, while the cognitive outcomes of the children at the age of 18 months were predicted by the extent of active infant-mother communications. This was due to the fact that interactions between the mother and her baby reflect the undeniable role of mother concerning intellectual and cognitive development. At the age of 5, no evidence was found concerning any adverse effects of postpartum depression on the cognitive function, even the susceptible children. However, Sinclair and Murray found that 5-year-old children whose mothers had postnatal depression were more likely to be categorized as children with behavioral disorders than control groups (24). The negative effects of postpartum depression can be intensified by parental conflicts and families' low social levels. There are other underlying factors that may play a role in children's behavior, such as gender. In this particular case, postpartum depression studies have demonstrated that boys experience more negative effects than girls (34). Numerous studies have indicated that male infants are at high risk for poor development when their mothers have postpartum depression. The risk is much less for female infants. In contrast, a study by Cohn et al. showed an association between infants' gender and postpartum depression; mothers with postpartum depression were found to interact less frequently with their male children than their female children (1). One possible explanation is that girls have the advantage of growing and maturing faster, which in general can protect them from social problems and experiences that are related to maternal postpartum depression. So, presumably, boys' ability to adjust and develop emotions and mental faculties requires the presence of healthy, sensitive mothers (17). Furthermore, it is possible that mothers with depression treat their sons and daughters differently or the infant's gender may affect the duration of maternal depression. Moreover, considering that boys are more likely to develop insecure attachments than girls, their social competence may be hindered and their natural behavioral problems may be exacerbated (29).

3. Conclusions

The most serious negative effects of postpartum depression are on the child's cognitive development, including language, IQ, and Piaget's object concept task. However, these effects are completely intermixed, and contextual factors and the infant's gender also are effective agents. The literature on child behavior confirms the effects of postpartum depression on children's behavior, antisocial behaviors, and psychiatric disorders at home and at school

up to 5 years postpartum. However, teachers' reports of child behavior do not support the effects of postpartum depression. Recent research has suggested that postpartum depression can affect child development. Fortunately, however, it is long-term and chronic maternal depression, rather than postpartum depression, that causes significant adverse effects on children's health. The adverse effects of postpartum depression on children's development seem to be mediated by the mother's interpersonal behavior and the infant's gender. However, the effects of depression get worse when the depression lasts for a long time and is associated with the other adversities of life.

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Conflict of Interest:
There is no conflict of interest to be declared.

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