

Critical Review:
Does exposure to maternal postpartum depression in an infant's early life predict delays in expressive language development?

Sophie Wharmby
M.Cl.Sc. (SLP) Candidate
University of Western Ontario: School of Communication Sciences and Disorders

This critical review examined how infant early exposure to maternal postpartum depression may have an effect on infants later expressive language development. A literature search yielded three within-groups longitudinal study's , one survey based correlational study and one literature review. Overall, there is suggestive evidence that exposure to postpartum depression early in an infant's life may negatively affect expressive language development. Study implications, clinical implications and future avenues of research are discussed.

Introduction

Approximately 10-15% of mothers in developed countries and approximately 40% of mothers in low-to-middle income settings show symptoms of postpartum depression (WHO and UNFPA, 2009). Postpartum depression is a collection of symptoms including but not limited to; changes in appetite, irritability, sadness, changes in sleeping patterns and feelings of guilt and/or worthlessness (American Psychological Association, 2008).

It has been shown that mothers with postpartum depression are more irritable when interacting with their babies and are more critical of their children in general. Mothers with postpartum depression have also been shown to be less warm and less consistent when interacting with their children, when compared to mother and infant interactions where postpartum depression is not a factor (Smith-Nielson et al., 2016). In addition, mothers diagnosed with postpartum depression have been shown to engage in less infant directed speech and are less vocally expressive and less facially expressive when interacting with their infants (Sohr-Preston and Scaramella, 2006).

Since infant direct speech, consistent maternal response and mother-infant relationship are important in developing language, this critical review will seek to determine if infant exposure to postpartum depression in early life will predict delays in expressive language development. Since the first few years of life are critical for the acquisition of language, it is important to examine how postpartum depression may affect this sensitive period of time in an infant's life. Potential findings could have ramifications in the practices and policy's implemented in Speech-Language Pathology (SLP) practices.

Objectives

Examine the literature to determine if presence of maternal depression negatively affects infants' expressive language.

Methods

Search Strategy

A systematic online database review using Western University's library search system Omni, PubMed and psycINFO yielded the articles for review. For all databases used, search terms included the following:

Maternal depression AND (language acquisition OR expressive language development)
Postpartum depression AND (language acquisition OR expressive language development)
Postnatal depression AND (language acquisition OR expressive language development)

Selection Criteria

Articles chosen to be included in this review were narrowed down to peer-reviewed articles published in 2000-2020, that specifically tested mothers for postpartum depression and examined the relationship between their infant's language development. In addition, only articles published in English were reviewed.

Data Collection

This review includes three within groups longitudinal study's, one survey based correlational study, and one literature review.

Results

Valla et al. (2016) conducted a within groups longitudinal study over 24 months on the association of postpartum depressive symptoms and infant's

communication skills at multiple stages within the infants first two years and consisted of ($n = 1555$) mother infant dyads. This longitudinal study had three hypotheses (1) if exposure to maternal postpartum depression at 6 weeks, 4 months and 6 months were related to later communication outcomes at 12 months and 24 months (2) if the extent of exposure to maternal postpartum depression (e.g., higher scores) were related to later communication outcomes at 12 months and 24 months and (3) to determine what extent of maternal postpartum depression at 6 weeks of age was related to differences in communication outcomes at 4, 6, 12, and 24 months.

Mothers were recruited from a well-baby program that is regularly attended by more than 95% of Norwegian parents. Mothers postpartum depression was determined by self-reported scores on the Edinburgh Postnatal Depression Scale (EPDS) with higher scores indicating higher levels of depressive symptoms. This study made no mention of mothers being assessed for postpartum depression prior to the administration of the EPDS. These scores were used dichotomously to determine whether or not the subject was depressed within the context of this study (e.g., score higher than 10/30), and also used continuously to determine approximately how long each infant was exposed to the postpartum depressive symptoms. Mothers were administered this questionnaire three times throughout the duration of the study – when their child was 6 weeks, 4 months and 6 months of age.

Child development was determined by the maternal reported answers to the Communication subtest of the Norwegian version of the Ages and Stages Questionnaire (ASQ). The communication subtest includes questions related to expressive language, along with questions related to other aspects of communication, however the final score on the ASQ is a summation of answers to all questions related to communication, not exclusively expressive language.

With regards to hypothesis 1, the results suggested that exposure to postpartum depression at 4 months is associated with lower language skills at 12 and 24 months of infant development, however exposure to postpartum depression at 6 weeks and 6 months was not associated with lower language skills at 12 and 24 months.

With regards to hypothesis 2, the results suggested that infants who were exposed to postpartum depression for longer (e.g., mothers with a score of ≥ 10 at 2 or more timepoints) had significantly lower language skills at 12 and 24 months of age.

With regards to hypothesis 3, there was no significant finding indicating that these data show there was no significant impact on language skills at later time points if infants were exposed to maternal postpartum depression at 6 weeks alone.

Strengths of this study include the large sample of dyads that were examined and the representative sample of the Norwegian population, considering how the authors acquired their participants. Weaknesses of this study include the use of self-report measures as skewed results may have been present. This could prove to be especially pertinent when mothers reported their infant's development through the ASQ. Any self-report measure should be interpreted with some degree of caution but given that some mothers scored particularly high on the EPDS this may have led to increased chance of skewed results. In addition, this study was conducted in Norway, which may have some generalization limitations for Canadian samples.

This study provides suggestive evidence that postpartum depression can result in delays of expressive language development.

Piteo et al. (2012) conducted a within groups longitudinal study over 18 months to examine the associations between maternal depression in the first 6 months after birth and cognitive language and motor development in infants at 18 months of age. This longitudinal study had two hypotheses (1) if infants whose mothers had depression at 6 months postpartum would have poorer developmental outcomes at 18 months, when compared to infants of mothers with no depression after controlling for demographics, infant prematurity and home environment and (2) if maternal depression at 6 months postpartum would be associated with poorer home environment at 18 months and if this in turn would relate to poorer infant development at 18 months of age. This study consisted of ($n = 345$) mother infant dyads.

Mothers depressive symptoms were assessed using EPDS, and infant's development was assessed using the BSID-III, and home screening questionnaire (HSQ) was used to examine home environment. Participants were gathered through participants from another study examining the effect of diet supplements on rates of postpartum depression.

In total 69% of mothers displayed depressive symptomology on the EPDS at one point in time (e.g., either 6 weeks or 6 months) with 11% of mothers displaying depressive symptoms at both points in time. Piteo and colleagues found that there was no relationship between maternal postpartum depression

in the first 6 months of life and infant development at 18 months.

Although this is in contrast to Valla and colleagues (2016) and other articles cited by Piteo and colleagues (2012), Piteo and colleagues noted that there was only a small proportion of mothers that exhibited depressive symptoms at both 6 weeks and 6 months postpartum, indicating that short periods of exposure to maternal depression may not have an effect on expressive language development and other developmental measures. These hypotheses about the results in this study agree with the findings by Valla and colleague's hypothesis 2.

A strength of this study was that it examined home environment separate from socioeconomic status (SES). The authors noted that it is possible to have a stimulating and rich language environment in a home with low SES and that these two factors need to be considered separately, as one does not necessarily determine the other. Weaknesses in this study include; not factoring in chronic postpartum depression as a separate category and performing analyses accordingly, potential biases in the method of collecting participants, and using self-report measures for all tests administered for data collection. In addition, this study was conducted in Australia, which may have some generalization limitations for Canadian samples.

Overall, this study provides suggestive evidence that early exposure to postpartum depression may negatively affect infant's expressive language development if it occurs for longer periods of time. Due to the sample being drawn from a list of mothers who had already participated in a study about postpartum depression this may have contributed to the high rate of postpartum depression in this sample. The main finding from this study is that the longer children are exposed to postpartum depression the greater the negative effects on expressive language development are, which coincides with the finding of Valla et al in 2016.

Stein et al. (2008) conducted a within groups longitudinal study over 3 years to examine the effects of postpartum depression and SES on children's language development at 3 years of age. This longitudinal study only assessed infants that were born full term, had English as their first language and consisted of ($n = 944$) mother infant dyads.

Participants were sorted into SES groups by the Socioeconomic Class Index. At 3 and 10 months, mothers were given the EPDS to complete, and at 36

months mothers were given the 12-item self-report General Health Questionnaire (GHQ) and the EPDS is not standardized for mothers with infants of 36 months. Children's language abilities were assessed using the 124-item Reynell Developmental Language Scale (RDLS) which assesses comprehension and expression of language.

Irrespective of SES, authors found that more maternal depressive symptoms significantly affected language development at 3 and 10 months but not at 36 months of age. Although this result may be valid it is also important to take into consideration that the EPDS was used at 3 and 10 months when the significant relationship was found, and the RDLS was used at 36 months of age when a significant relationship was not found. Separately, the added effect of low SES was strongly associated with poorer language development.

Strengths of this study included; independently addressing SES in conjunction with maternal postpartum depression to uniquely assess effects on language development for these particularly vulnerable populations and assessing a large number of mother infant dyads in order to strengthen the power of the statistics and results. A weakness of this study was using two different measures of maternal depression (the EPDS and GHQ), which affected the strength of the results. In addition, this study was conducted in England, which may have some generalization limitations for Canadian samples.

Overall, this study provides suggestive evidence that early exposure to postpartum depression may negatively affect infant's expressive language development. In addition, this study provided some preliminary data that this relationship may be stronger for people in low SES households, providing an avenue for further research.

Kaplan et al. (2014) conducted a survey based correlational study to determine whether scores of maternal depressive symptoms correlated with delays in cognitive functioning, receptive language and/or expressive language development. This study was conducted as a sub-study to a larger scale longitudinal study on postpartum depression and overall child development. Authors noted that they attempted to over-recruit mothers with a history of depression, by placing emphasis on a history of depression in recruitment advertisements. This study consisted of ($n = 91$) mother-infant dyads, with all infants being 1 year of age at the time of the sub-study. Thirty of these mothers indicated an elevated level of depressive symptoms – as scored by the self-report measure of the

Beck Depression Inventory – II (BDI-II). Of the 30 mothers with elevated depressive symptoms on the BDI-II, 18 scored within the mild category, 9 in the moderate range, and 3 in the severe range – for further analyses the moderate and severe category were combined to improve sample sizes (e.g., 12 dyads were included in a moderate-severe category). The majority of these mothers had household incomes of more than \$50 000 per year ($n=46$). Infants were then assessed using the Bayley Scales of Infant and Toddler Development – III (BSID-III) to determine cognitive development, receptive language development and expressive language development. During testing 11 infants were unable to complete the testing requirements and were subsequently excluded from analyses ($n = 80$). Only the relationship between mothers BDI-II scores and infants BSID-III scores on the expressive language subtest were included in the current review.

A first order correlation was conducted on BDI-II data and BSID-III data. BDI-II scores of mother's depressive symptoms showed a significant ($p > .01$) negative correlation with infants BSID-III scores meaning that mothers who reported higher levels of depressive symptoms, had infants that scored lower on expressive language subtests for the BSID-III.

A strength of this present study is that it was one of the first papers to note that maternal depression had a negative effect on expressive language in a low-risk population (e.g., mothers with higher SES). The authors attributed this to the improved sensitivity of the BSID-III over the old BSID-II edition. A weakness of this study was also that it only looked at mothers who were comparatively low-risk, however mothers who are in a high-risk population (e.g., low SES and other contributing factors) may have yielded entirely different results. Another limitation that the authors noted was the potential for the decreased expressive language output to be due to a performance issue and not a competence issue, since these children may be rewarded less for expressive language output than children on non-depressed mothers. Further research is needed in order to tease apart the subtle relationship between performance and competence in these infants.

Overall, this study provides somewhat suggestive evidence that exposure to postpartum depression early in life can negatively affect expressive language development. In order to increase the strength of this evidence, the authors would have benefitted from using a scale directly focused on assessing postpartum depression (e.g., EPDS) and not depression in general like the BDI-II.

Sohr-Preston and Scaramella (2006) conducted a literature review to examine whether infant exposure to maternal depression affected child's early cognitive and language development. For the purposes of this review, only the language development portion of this review will be examined.

This review examined mothers with clinical and subclinical levels of depressive symptomology. Sohr-Preston and Scaramella (2006) found that mothers who are depressed are less vocally and facially expressive, use less infant directed speech and are more likely to speak with a flat tone of voice than mothers who are not depressed. The authors concluded in their review that these effects could lead to difficulties learning language because they are less exposed to the beneficial aspects of infant-directed speech, which in turn could relate to delayed expressive language development.

Sohr-Preston and Scaramella further went on to examine how maternal depression affects language development during the 3-6 month age range. They noted that this is the time when infants begin associating two separate events together, however with inconsistent maternal responses – typical of mothers with depression – this can slow the development of more nuanced aspects of language learning and cognition. This could be due in part to the infants inability to perceive predictability in everyday life. During the 6-12 month age range, the authors noted that this is the time when mothers and infants begin to engage in joint attention – that is, looking at and interacting with the same objects. Joint attention facilitates language learning as the child is able to associate the mother's vocalizations with the object that they are both attending to. The authors went on to cite many papers that have shown that depressed mothers have a harder time engaging in and maintaining joint attention. Finally, in the 1-2 year age range the authors noted many papers that have shown that mothers who remain depressed at this point in time engage in less symbolic or pretend play and less book reading. All of these deficiencies in early language exposure and play could lead to decreased expressive language output.

A strength of this review was the amount of peer-reviewed research that was reviewed in a clear and concise way. A weakness of this review is that a lot of the research is now over 10 years old, and some of the studies cited should be replicated in order to provide insights into mothers with depression today.

Overall, this literature review provides equivocal evidence about the relationship between postpartum depression and expressive language development.

Discussion

The studies analyzed in this review provided suggestive evidence that infant exposure to maternal postpartum depression in early life could affect expressive language development. It is important to note that most studies made use of self-report measures for both maternal postpartum depression and infant expressive language development. This could have led to some biases in reported results, especially due to the nature of the studies – mothers may have scored their children higher, for fear that they may be seen as not doing an adequate job caring for their child.

In addition, a lot of studies had very high rates of postpartum depression, including Stein et al. (2008) reporting 69% of mothers having elevated levels of postpartum depressive symptoms for at least one time point. This is in stark contrast to the 10-15% prevalence that the WHO reported for developed countries (WHO and UNFPA, 2009). Therefore, there is some additional caution that should be taken when interpreting these results as there may have been methodological or sampling biases used that were not reported in the studies.

Future research in this field should focus on:

- 1) Studying the effects of exposure to postpartum depression and language development specifically, and not just in addition to global developmental milestones.
- 2) Determining how long exposure to maternal postpartum depression can be before deficits in language development can be seen.
- 3) Examining whether other siblings have a mitigating or aggravating contribution to this relationship.
- 4) Examining whether this result is higher or lower in families with dual- or sole-support parents.

Conclusion

Overall there is suggestive evidence that maternal postpartum depression and infant expressive language deficits are related. Large longitudinal studies have shown that longer periods of time can have more detrimental effects on language development, however, more research needs to be done in order to learn more about how these factors relate to one another.

Clinical Implications

There is not enough evidence to definitively say that exposure to maternal postpartum depression early in an infant's life will predict delays in expressive language development, however there is a relationship between the two factors that should not be ignored. SLPs should be conscious of the fact that mothers displaying symptoms of postpartum depression should be referred on to a mental health professional for further assistance. It is important to consider the interactional style of these mothers and babies without placing blame on a relationship that might already be strained. SLPs should be sensitive to postpartum depressive symptomatology and do what they can, within their scope of practice, to assist mothers and their children.

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