

MATERNAL ANXIETY IN THE PRE- AND POSTNATAL PERIOD: A LITERATURE REVIEW

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This study intended to present a systematic review to analyze the empirical studies published between 1998 and 2003 about maternal anxiety in the prenatal and postnatal periods, focusing on pre-term and term births. Nineteen studies were found; six of which evaluated maternal anxiety in the prenatal period, 12 studies evaluated anxiety in mothers in the postnatal period and only one study evaluated maternal anxiety in both periods. The results showed that high levels of maternal anxiety in the prenatal phase were associated with obstetric problems, emotional damages to fetal development, behavioral problems in childhood and adolescence. The mothers presented higher anxiety levels when compared with the fathers. The co-occurrence of maternal anxiety and depression was found. The maternal anxiety assessment is relevant to identify both maternal mental health and child development at risk.

DESCRIPTORS: anxiety; premature birth; term birth

ANSIEDAD MATERNAL EN EL PERÍODO PRENATAL Y POSTNATAL: REVISIÓN DE LA LITERATURA

La finalidad de esta revisión sistemática de la literatura fue analizar la producción científica entre 1998 y 2003 de estudios empíricos en la temática de ansiedad en las fases prenatal y postnatal, enfocando nacimientos del pre-término o del término. Se obtuvieron 19 artículos, de los cuales 6 evaluaron la ansiedad maternal en el período prenatal, 12 estudios evaluaron la ansiedad en madres en el período postnatal y solamente un estudio evaluó la ansiedad maternal en ambos períodos. Los resultados demostraron que altos niveles de ansiedad maternal en la fase prenatal fueron asociados a complicaciones obstétricas, daños al desarrollo fetal, problemas emocionales y comportamentales en la infancia y la adolescencia. Las madres habían presentaron niveles mayores de ansiedad en comparación con los niveles presentados por los padres. Se verificó la co-ocurrencia entre los niveles de ansiedad maternal y la depresión. La evaluación de la ansiedad maternal es relevante para identificar riesgos en la salud mental maternal y en el desarrollo del niño.

DESCRIPTORES: ansiedad; nacimiento prematuro; nacimiento de término

ANSIEDADE MATERNA NOS PERÍODOS PRÉ E PÓS-NATAL: REVISÃO DA LITERATURA

Revisão sistemática da literatura que teve por objetivo analisar a produção científica entre 1998 e 2003 de estudos empíricos sobre a temática ansiedade materna, nas fases pré e pós-natal, focalizando tanto nascimentos pré-termo quanto a termo. Foram obtidos 19 artigos, dos quais seis avaliaram a ansiedade materna no período pré-natal, 12 estudos avaliaram a ansiedade em mães no período pós-natal e apenas um estudo avaliou a ansiedade materna em ambos os períodos. Os resultados mostraram que altos níveis de ansiedade materna na fase pré-natal foram associados a complicações obstétricas, prejuízos ao desenvolvimento fetal, problemas emocionais e de comportamento na infância e na adolescência. As mães apresentaram maiores níveis de ansiedade quando comparados aos níveis apresentados pelos pais. Foi verificada a co-ocorrência entre os níveis de ansiedade e depressão materna. A avaliação da ansiedade materna é relevante para identificação de riscos na saúde mental materna e no desenvolvimento da criança.

DESCRIPTORES: ansiedade; nascimento prematuro; nascimento a termo

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Anxiety disorders figure among the most frequent psychiatric disorders in the population and anxious symptoms are among the most common ones. They can be found in any person during certain periods in his/her life. However, this anxiety can be pathological when it is disproportional to the situation that unleashes it or when there is no specific motive for its appearance⁽¹⁾ or, also, when it is an inadequate answer to a certain threat, due to its intensity or duration⁽²⁾.

On the one hand, pregnancy, delivery and the puerperal stage represent sensitive periods in women's life *span*. These periods involve great transformations, not only from a physiological perspective, but also from the *psychological* perspective and of the female social-family role. Furthermore, the physical changes that occurred during pregnancy can provoke emotional instability in women⁽³⁾.

On the other hand, the occurrence of maternal psychopathological disorders can exert *detrimental* effects on the child's development. There are three possible reasons for this impact, which are: the direct effect on the child, who is exposed to the parents' mental disorder, the indirect impact of parental disorder on interpersonal relations and the presence of adversities commonly associated with psychiatric disorders⁽⁴⁾.

Due to the impact they exert on the couple's life and the children's development, among maternal psychological symptoms, anxiety and depression stand out, which can be manifested in the prenatal and in the postnatal phase⁽⁵⁾.

When a *normal and healthy* infant is born, the mother needs to adapt her idealized image of the baby to the *real baby* who is *actually* there. However, this adaptation becomes more difficult for the mother of a premature baby⁽⁵⁻⁶⁾, as the impact of premature birth tends to be an emotionally distressing experience for most mothers, who can be more exposed to the experience of anxious symptoms, even when the baby is clinically stable⁽⁶⁻⁷⁾.

In order to minimize the impact of immediate negative consequences of the baby's premature birth, changes in neonatal care practices have been proposed, including stimulation and encouragement of early contact between mother and child and the parents' active participation in care for the baby inside the Neonatal Intensive Care Unit^(4,7-8). This early intervention modality aims to reduce high maternal

anxiety levels and promote the mothers' exclusive psychological well-being and represents a measure to prevent adaptive development problems in the child⁽⁸⁾.

The purpose of this study was to analyze scientific production based on empirical articles about maternal anxiety in the pre- and postnatal phases, focusing on pre- as well as full term births.

METHOD

We exclusively searched empirical articles indexed in electronic databases (MedLine, PsycInfo and Lilacs), through a survey with the following key-words: *mother* OR *maternal* OR *family* AND *anxiety* AND *prematurity* OR *preterm* OR *very low birth weight* OR *premature* OR *neonate* AND *NICU* and its corresponding terms in Portuguese (Brazil). All registers of articles published between 1998 and 2003, which contained any of the combinations of the key words in the indexed literature, referring to empirical research published in English/Spanish/Portuguese, were identified, analyzed and classified. To the results obtained in this first survey (62 articles), we applied criteria to exclude review articles (11 articles) and articles whose objectives were incompatible with the theme of our review (26 articles). Twenty-five articles remained, 19 of which were found in national libraries and six were excluded because they could not be accessed in Brazil.

RESULTS

In the total set of 19 studies, six (31%) assessed maternal anxiety in the prenatal phase, one of which was a cross-sectional study⁽⁹⁾, while the others had a prospective longitudinal design. Only one study involved mothers of low-weight (< 2,500g)⁽¹⁰⁾ premature babies (< 37 weeks of gestational age) and five were carried out with mothers of full-term babies.

Twelve of the 19 studies (63%) assessed maternal anxiety in the postnatal period only, in cross-sectional studies. Six of these were carried out with mothers of premature infants and six with mothers of full-term babies.

Only one of the 19 studies assessed anxiety at two times, in the pre- and postnatal phases, using

a comparative design between paired samples of mothers of full-term babies.

Studies on maternal anxiety in the prenatal period

As to the assessment of maternal anxiety in the prenatal phase, only one study looked at mothers of *pre-term and low birth weight infants*. When examining the relations between prenatal maternal psychosocial risk factors and low *birth weight*, the authors concluded that maternal prenatal risk variables like number of cigarettes smoked per day, education level, number of daily stressors and number of hours worked represented different contributions for each group of babies as risk factors for low *birth weight*. Furthermore, in none of the baby groups, according to the birth weight percentile, maternal anxiety showed to be a significant predictive variable for low *birth weight*⁽¹⁰⁾.

One study observed the effects of maternal anxiety as a risk factor during pregnancy, which examined the association between obstetric complications and symptoms of anxiety and depression in mothers of full-term infants. The authors observed that women diagnosed with prenatal anxiety disorder had a greater probability of presenting a history of obstetric complications during pregnancy. The study concluded that obstetric complications acted as chronic distressors during pregnancy⁽¹¹⁾.

Maternal anxiety was considered a risk factor for normal fetus development in two studies⁽⁹⁻¹²⁾. In one of these studies, the authors examined the effects of acute distress responses and maternal anxiety on the physiological response of fetal *heartbeat* heart rate. The women were submitted to a distress situation in the third semester of pregnancy and, then, were divided in two groups according to the anxiety level. It was concluded that, although there was no significant difference between the groups of mothers with low or high maternal anxiety levels, the fetuses of mothers with high anxiety levels revealed high heart rate frequencies in comparison with the fetuses of mothers with low anxiety levels during the maternal distress situation. Furthermore, the mothers with high anxiety levels reacted to the distress situations with different reactivity patterns than mothers from the groups with low anxiety levels⁽⁹⁾. In the second study⁽¹²⁾ on pregnant adolescents, the relation was verified between the results of maternal emotional (trait and emotional state) and biological measures and the results of the reactivity of

the fetus' autonomous nervous system, particularly heart tonus. It was found that high scores of negative emotions, including maternal anxiety in the 16th week of pregnancy, predicted low heart tonus in the fetus and high Apgar scores 5th minute. These contradictory findings show the differential effect of maternal emotions during pregnancy and on fetal development. The authors raise the explanatory hypothesis that, although anxiety is related with the fetus' low heart tonus in the first semester, at the same time, it can indicate positive maternal behavior related to concern with pregnancy and the consequent health care, which can lead to better birth conditions for the baby.

Maternal depression was assessed together with anxiety in studies that observed that differential effects of these maternal indicators during childhood and adolescence⁽¹³⁻¹⁴⁾. The effects of prenatal maternal anxiety and pre- and postnatal maternal depression were assessed in the production of behavioral and emotional problems in children at four years of age. A significant correlation was found between maternal anxiety and depression measures in the prenatal period and a moderate correlation between prenatal anxiety and postnatal depression. The high levels of prenatal anxiety and pre- and postnatal depression were responsible for doubling or tripling the mean rate of behavioral and emotional problems in children at four years of age. Prenatal maternal anxiety and postnatal maternal depression contributed independently in the prediction of behavioral and emotional problems in children assessed at the age of four⁽¹⁴⁾. On the other hand, when examining the relations between pre- and perinatal events and risks for the development of psychopathologies during adolescence, it was observed that, during pregnancy, mothers who presented emotional problems, including anxiety and depression, had children with a greater probability of developing major depression and behavioral disorders during adolescence. Hence, the findings of this study indicate that maternal anxiety and depression appear as risk factors for the development of psychopathologies during the child's adolescence⁽¹³⁾.

Summarizing, it was found in these studies that the occurrence of high levels of maternal anxiety in the prenatal phase was associated with a higher number of obstetric complications⁽¹¹⁾ and jeopardized fetal development, such as a higher number of abnormalities⁽¹²⁾ and high fetal heart rate frequencies⁽⁹⁾. It was also observed that high levels

of maternal anxiety in this phase were associated with emotional and behavioral problems, in children at the age of four⁽¹⁴⁾ as well as in adolescents⁽¹³⁾. However, the presence of maternal anxiety did not serve as a significant predictor of low birth weight⁽¹⁰⁾.

Studies on the assessment of maternal anxiety in the postnatal period

Studies that assessed anxiety in mothers of full-term babies appoint harmful effects for the baby's development. When verifying the relations between maternal mood, including maternal anxiety, and the development of full-term babies assessed through the *Griffiths Scale* at the age of three months, it was observed that the mothers' scores on *Zung's Anxiety Scale* predicted the babies' development scores on the *Griffiths Scale*; the higher mothers scores on *Zung's Anxiety Scale* (greater maternal anxiety), the lower the babies' development scores on the *Griffiths Scale*, appointing greater commitment of the babies' development⁽¹⁵⁾.

Two different studies assessed postnatal anxiety in relation with mother-child bonding⁽¹⁶⁻¹⁷⁾. The incidence of maternity blues was related with bonding in mothers of full-term babies in the postpartum period. In this study, maternal bonding included two factors: the nucleus of maternal bonding and maternal anxiety directed at the child. The authors found strong correlations between *maternity blues* and maternal anxiety directed at the child and the maternal bonding nucleus; the stronger the *maternity blues*, the higher the maternal anxiety level directed at the child. The baby's birth order and *maternity blues* were predictive values of maternal anxiety directed at the child⁽¹⁶⁾. Another study looked at maternal concerns and bonding behaviors in three groups, differentiated in terms of neonatal risk, conditions of proximity, separation and potential loss of the baby. The findings showed that high levels of trait anxiety and separation anxiety in the mothers, independently of the baby's medical condition and the separation between mother and child, explained the variation in the cognitive components and concern, stress level and maternal stress coping in the postnatal phase⁽¹⁷⁾.

The maternal history of sexual abuse was considered in two studies that assessed maternal anxiety in the postnatal period⁽¹⁸⁻¹⁹⁾. The mothers of full-term babies were divided in two groups, differentiated by the presence of not of sexual abuse

in their childhood, and diagnosed with at least one episode of major depression in the postpartum period. The authors found that mothers with a history of sexual abuse presented higher levels of anxiety and depression than mothers in the control group⁽¹⁸⁾. In another study, trait-anxiety levels were compared in two groups of mother, differentiated according to their babies' birth condition (pre-term or full-term) and to the history of sexual abuse. The groups of mothers were stratified in terms of the presence and history of sexual abuse. In the results, considering the baby's birth condition and the mother's history of sexual abuse, the groups showed no difference in maternal trait-anxiety levels⁽¹⁹⁾.

Two studies assessed maternal anxiety in an intervention context, comparing groups of mothers⁽²⁰⁻²¹⁾. The maternal mood indicators (including anxiety and depression), conjugal satisfaction and the baby's temperament were compared in two groups of mothers of full-term babies: one group of mothers admitted at the *Parentcraft Unit* of a hospital and a comparison group that received routine follow-up from the service unit. The mean trait and state-anxiety scores of mothers from the *Parentcraft Unit* were higher in comparison with the means of mothers from the comparison group. Furthermore, the authors found significant correlations between anxiety and maternal depression scores and the babies' difficult temperament, in both groups of mothers; the higher the maternal anxiety and depression scores, the more the mothers perceived that these babies had a difficult temperament⁽²⁰⁾. In another study, which compared two groups of mothers of babies born with very low weight (<1,500g), with a gestational age of less than 30 weeks and admitted in an NICU, differentiated by their participation or not in the *Buddy Program*, the authors assessed the efficacy of this program to relieve distress, anxiety and depression and promote social support for the parents. The *Buddy Program* involved the offering of support to the mothers by other voluntary parents who had been through the experience of having their babies hospitalized at an NICU. The authors observed that, at baseline, the mothers from both groups presented high levels of distress, anxiety, depression and social support. The mothers who participated in the *Buddy Program* displayed lower state-anxiety and depression scores and a greater perception of social support than mothers from the control group. No significant differences were found between the groups for trait-anxiety levels⁽²¹⁾.

Maternal anxiety was also assessed on the basis of reports on mothers' experiences related to the separation from their full-term babies, hospitalized at an NICU. With respect to the results of the reports obtained from the mothers' experiences during the babies' hospitalization, the mothers expressed that they felt anxiety due to the possibility of causing prejudice to the baby through the early separation, due to the baby's hospitalization at the NICU⁽²²⁾.

When assessing the state-anxiety of fathers and mothers of full-term babies in the postnatal period, using the STAI, the authors emphasized the mothers' vulnerability in view of the baby's birth, as they presented higher levels of anxiety than the fathers during all postnatal assessments⁽²³⁾. These findings corroborate the results found in another study carried out with mothers and fathers of premature and low birth weight babies hospitalized at an NICU⁽²⁴⁾.

The studies that assessed maternal anxiety and depression levels in the postnatal period appointed that, independently of the baby's birth condition (premature or full-term) and hospitalization at an NICU, these symptoms co-occur^(15-17,20,25-26), ratifying the results of studies that assessed maternal anxiety in the prenatal period⁽¹³⁻¹⁴⁾.

Besides being an important predictor of development problems in babies⁽¹⁵⁾, high levels of maternal anxiety have been associated with a history of maternal sexual abuse⁽¹⁸⁾. Furthermore, high levels of trait-anxiety have been associated with variations in cognitive components and concerns, distress levels and coping⁽¹⁷⁾. In an intervention context, the mothers' state-anxiety levels were significantly reduced after their participation in intervention programs⁽²¹⁾ and the presence of high levels of maternal anxiety was associated with the babies' difficult temperament⁽²⁰⁾. Finally, independently of the baby's birth condition and hospitalization at an NICU, studies that assessed mothers' and fathers' anxiety unanimously appointed that the mothers presented higher levels of anxiety in comparison with the fathers^(23-24,26), while studies that assessed maternal anxiety and depression appointed towards the co-occurrence of these symptoms^(15-17,20,25-26).

Studies on the assessment of maternal anxiety in the pre- and postnatal period

One single study was carried out involving mothers of full-term babies and a within group

comparison design, comparing the assessment of maternal anxiety in the pre- and postnatal phase. The authors checked for associations between anxiety, depression and the quality of the marital relation and maternal perceptions of the baby's temperament and of changes in the sense of maternal self-efficacy. It was found that maternal state-anxiety was negatively correlated with maternal efficacy in the first month after birth. When comparing the prenatal period with two moments in the postnatal period (at one and three months), they found a significant increase in the sense of maternal self-efficacy over time. Furthermore, they observed a significant decrease in anxiety and depression scores, in the mothers' positive perceptions of their marriage and negative perceptions of the baby's temperament, when comparing the assessment moments in the pre- and postnatal period⁽²⁷⁾.

DISCUSSION

Focusing on maternal anxiety, most of these studies focused on assessments in the postnatal period, attempting to assess the effect of the baby's birth, whether premature or not, on the mothers' emotional state. Thus, it is observed that the assessment of maternal anxiety in the postnatal phase only, without knowing about the baseline in the prenatal phase, can affect the understanding of the results. From a methodological viewpoint, within group *comparative* comparison research designs are recommended, which permits the assessment of anxiety levels in the pre- and postnatal phase. The only study that used this design observed that *the natural passage of time* was an important variable for the significant reduction of maternal anxiety levels as well as for the significant increase in the mothers' sense of self-efficacy⁽²⁷⁾.

Although it has not been directly associated with the low birth weight condition⁽¹⁰⁾, the presence of high levels of maternal anxiety in the pre- and postnatal phase has been related with obstetric complications⁽¹¹⁾, such as vaginal bleeding and threats of abortion for example, and with fetal development, such as differences in reactivity patterns and high heart rate⁽⁹⁻¹²⁾ and also with emotional and behavioral problems during childhood and adolescence^(15,17,20). This reaffirms the negative impact of the mothers' anxiety on the development of their children, as observed in earlier research⁽⁵⁻⁶⁾.

High levels of maternal anxiety were neither related with premature birth nor with a history of maternal sexual abuse⁽¹⁹⁾. However, an opposite result was found in the study in which mothers with a history of sexual abuse in childhood presented high levels of maternal anxiety⁽¹⁸⁾.

As to the assessment of mothers' and fathers' anxiety, independently of the baby's birth condition, all studies pointed towards the mothers' greater emotional vulnerability, as they presented higher levels of anxiety in comparison with the fathers^(23-24,26). This finding reaffirms that, due to the physical changes occurred during pregnancy, women can have greater propensity to emotional instability, as opposed to men⁽³⁾.

Furthermore, the reduction in the state-anxiety levels of mothers of premature babies with very low birth weight, observed after their participation in intervention programs⁽²¹⁾, showed that early intervention also contributed to the promotion of mothers' psychological well-being⁽⁷⁻⁸⁾. Studies about the assessment of intervention and parental support programs' efficacy to reduce high maternal anxiety levels should include the analysis of important variables for the establishment of a control group, so as to allow for possible comparisons between the results of maternal anxiety assessments. Intervention programs to relieve anxiety in parents of premature babies hospitalized at NICU's should consider the type of social support granted to parents of premature babies.

When assessing maternal anxiety, independently of the baby's birth condition and the moment of this assessment, before or after birth, 63% of the studies found a relation between anxiety and depression^(15-17,20,25-26). High levels of anxiety seem to interact with high levels of depression, thus strengthening the former's effects on the child's development and on the mother's emotional well-being.

The effects of the anxiety and depression variables in the prenatal phase, related with the prediction of behavioral and emotional problems in full-term children, assessed at the age of four, were found independently in only one study⁽¹⁴⁾. Clarifications about the differential effect of maternal anxiety and depression must be guaranteed in this kind of study as, from a methodological viewpoint, there is a certain difficulty to assess anxious and

depressive symptoms, due to the superposition of these two sets of symptoms⁽¹⁾.

In the studies that were analyzed, maternal anxiety was mainly assessed through psychometric scales. With respect to the instruments used to assess maternal anxiety levels, the State-Trait Anxiety Inventory (STAI) was used in about half of the studies (52%). Two other studies (10%) used the Crown-Crisp and the state-anxiety subscale of the Trait-State Personality inventory to assess anxiety in mothers of full-term babies. These instruments present strong correlations with the STAI and, thus, the assessment of anxiety through the same validated instrument or correlated instruments turns the results of both studies comparable. However, the studies treated the data about anxiety measures as scores, without a specific analysis of the value they were attributed. The use of the STAI in the analyzed studies illustrates the importance of the instrument to assess anxiety, which should encourage psychometric studies in Brazil.

Variables like the natural passage of time, the baby's discharge from the NICU and the provision of parental support, presented in studies with mothers of premature and full-term babies, seem to act in the reduction of maternal anxiety levels, as the mothers have the opportunity to get emotionally rebalanced when assuming their role as their baby's primary and main caregiver.

CONCLUSION

Returning to the objective of this study, it was found that the presence of high anxiety levels in mothers, independently of the baby's birth condition and the moment of assessment, constitutes a potential risk factor for maternal emotional balance as well as for the child's development, even in the fetal period.

The identification of maternal anxiety levels allows for the adequate implementation of early intervention measures and the prevention or, when inevitable, neutralization of possible effects of maternal anxiety related to *detrimental* effects on the development of premature infants. Finally, research on maternal anxiety is fundamental to identify the factors related with the potential negative effect on the child development of premature as well as full-term infants.

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