


Difficulties in Pregnancy Adjustment as Predictors of Perinatal Depression: Indirect Effects through the Role of Brooding Rumination and Maternal–Fetal Bonding

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Abstract

Objective The aim of this research was to study the ways in which problems of adaptation to pregnancy influence the development of symptoms of perinatal depression via the presence of brooding and low maternal-fetal bonding, in addition to other risk factors previously established in the literature.

Study Design Representative sample of pregnant women in the third trimester of gestation ($N = 594$) completed an online survey that included sociodemographic data and measures of perinatal depression, adjustment to pregnancy, bonding, and brooding. Other risk factors were also assessed as covariates, such as previous history of depression, generalized anxiety, perceived social support, and experience of stressful life events. Descriptive and correlational analyses were performed on the scores obtained by the subjects with the different instruments. A path model was formulated to establish the pathways through which adjustment influences perinatal depression symptomatology. On the one hand, the presence of brooding (worst adjustment to pregnancy → high brooding → perinatal depression symptomatology), and on the other hand, the quality of maternal-fetal bonding (worst adjustment to pregnancy → poor quality fetal-maternal bonding → perinatal depression symptomatology) would act as a mediator.

Results The factors proposed by the literature were predictive of perinatal depressive symptomatology and the quality of adjustment to pregnancy. Problems adjusting to changes during pregnancy and experiencing it unsatisfactorily may predict individual differences in perinatal depressive symptoms. Significantly, this relationship was mediated by two key factors, the presence of brooding and low quality of the maternal-fetal bond.

Conclusion Our results provide evidence in favor of the existence of multiple paths through which difficulties in adapting to pregnancy can favor the occurrence of higher levels of perinatal depressive symptoms and identify new avenues for developing research in this area and preventive interventions empirically informed.

Keywords

- ▶ perinatal depression
- ▶ brooding
- ▶ maternal-fetal bonding
- ▶ adaptation to pregnancy

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Being pregnant can be a very exciting yet also complex experience for many women. The hormonal changes and adjustment difficulties that are typical of pregnancy can cause frequent mood disturbances, which, if exacerbated, can lead to the onset of mood disorders.¹ Specifically, perinatal depression has notably high incidence rates, particularly during the third trimester of pregnancy.²

Perinatal depression comprises the presence of major depressive disorder symptoms, with onset during pregnancy, lasting up to 3 months postpartum, after which it is termed as postpartum depression.² The prevalence rate of perinatal depression is between 10 and 20% and rising to 26% in adolescent mothers.^{3,4} However, despite this high prevalence, 14 to 25% of pregnant women who meet diagnostic criteria for this problem are not diagnosed or receive psychological treatment.² This is due to the lack of training of health professionals to detect mental health problems and the stigmatization of maternal depression, with depressive symptomatology being attributed to the organic condition of being pregnant.⁵

Developing effective ways to detect and prevent the occurrence of depressive symptoms during pregnancy is highly relevant, not only because of the medical and psychological consequences that depression has on the mother and the baby, but also because of its influence on the quality of the relationship that the mother will establish with him/her.⁶ Studies show that depressive symptomatology in pregnancy, when not properly treated, is associated with higher risk of premature birth, as well as with lower birth weight and more heightened irritability in the newborn.⁷⁻⁹ In addition, depressive symptomatology in pregnancy is considered a risk factor for developing adequate maternal-fetal bonding. Several studies show a relationship between depressive symptomatology during pregnancy, lower quality of breastfeeding 2 months after childbirth, and a poorer experience of motherhood 1 year after childbirth.¹⁰

In view of all these issues and given the relevance of establishing adequate models for the prevention of perinatal depression, this study aimed to identify possible mechanisms and paths influencing its development, going beyond the risk factors that have been previously established in the literature, as detailed below.

Risk Factors for Perinatal Depression

Research has focused on the better understanding of depressive symptomatology during pregnancy and its prevention. Different risk factors contributing to its development have been established. The exhaustive study by Lancaster et al¹¹ established the main sociodemographic risk factors for the development of perinatal depression as: low socioeconomic level, use of private medical insurance (the review was conducted in a population within the American health system), among others. In addition, as shown in other investigations, psychological or psychosocial factors include the presence of anxiety during pregnancy,¹² having a previous history of depression,^{13,14} the experience of negative stressful life events,¹⁵⁻¹⁷ and a lower educational level.¹⁸ Moreover, the

lack of support from a significant other such as one's partner is linked to an elevated risk of developing depressive symptoms during the third trimester of pregnancy.^{11,17,19,20}

Despite advances in understanding these risk factors, there is still considerable room for improvement in predicting and detecting perinatal depression during pregnancy, as discussed above. The most recent research highlights the need to better understand the role of other psychosocial processes, both individual and relational, that have not yet been fully considered in this field.^{2,11} From this view, several key aspects that must be considered include: (1) how the difficulties women have in adapting to their pregnancy, as well as (2) the way in which they regulate the negative emotions this produces in them and (3) the quality of the bonding they establish with their baby, can all relate and contribute to the development of perinatal depressive symptoms.

Adaptation to Pregnancy

The transition to motherhood involves major adjustments and changes to all aspects of a woman's life.²¹ Adaptation to pregnancy is thus defined as the woman's acceptance responses to the changes produced by her baby's development and the satisfaction of being pregnant.²² It is fundamental to having a healthy experience of pregnancy.²³ A certain ambivalence is common among pregnant women, since total and complete adaptation to pregnancy is unusual.^{22,24} Nevertheless, insufficient adaptation to pregnancy is linked to lower tolerance of changes and physical discomfort, a greater fear and anxiety, and a tendency to experience low mood and/or despair that can lead to conditions of clinical depression during pregnancy.^{22,25}

The mechanisms involved in the contribution of low adaptation to pregnancy to perinatal depression onset may not be particularly clear, a link could be mediated by various factors: individual factor, by the way that negative emotions produced by the adaptation difficulties of pregnant women are managed (brooding); and relational factor, by the quality of the maternal-fetal bond that the mother is establishing with her baby as a result of these adaptation problems. Both factors could be two of the main ways through which depressive symptoms during the third trimester of pregnancy develop because of low adaptation to pregnancy.

Brooding

Individual cognitive processes, such as how a pregnant woman interprets emotionally ambiguous situations in her environment, as well as the thinking styles used to cope with negative moods²⁶ can facilitate the development of perinatal depressive symptomatology.²⁷ In this sense, a ruminative style, characterized by higher attention to negative cognitions,²⁸ could predict and maintain the negative mood states typical of depressive symptoms^{29,30} acting as downward spirals.³¹

Rumination comprises the occurrence of recurrent thoughts that focus the individual's attention on negative moods and their consequences.³² Specifically, brooding

involves persistent passive thinking in response to sad moods, focused on past problems.^{32,33}

Numerous studies show that higher levels of brooding are generally associated with greater vulnerability to develop depressive episodes as well as with increases in their duration.³⁴ In the case of pregnancy, higher levels of brooding have been linked to higher levels of depressive symptomatology.²⁷ Specifically in the third trimester of pregnancy, brooding is a predictor of depressive symptomatology^{27,35,36} and thus an important subject of study as a possible mechanism involved in the development of perinatal depression because of problems in adapting to pregnancy.

Maternal–Fetal Bonding

Poorer quality of bonding during pregnancy, because of pregnancy adaptation issues, should also be considered as a clear predictor of perinatal depressive symptoms. Maternal–fetal bonding is the mental representation a mother develops regarding her baby and her care behaviors toward it (i.e., having good nutrition, trying to maintain a stable state of mind, the experience of early motherhood or nesting).³⁷ An adequate bonding must be established to ensure the further development of the child and its relationship with the mother. Good quality bonding during pregnancy is associated with higher quality of mother–baby interactions 12 weeks after giving birth.³⁸

On the one hand, poor adaptation to pregnancy is one of the risk factors for the development of low-quality maternal bonding.²³ Women who have more difficulty in adjusting to their pregnancy experience greater ambivalence toward pregnancy and dislike of their physical image, exhibit fewer care behaviors, and feel less attached to their baby,³⁹ resulting in poorer quality bonding.²³ On the other hand, poorer quality maternal–fetal bonding is related to the development of depressive symptomatology.^{1,40,41} Bonding can be considered as a protective factor during pregnancy against difficulties and/or tensions that may arise in the adjustment to pregnancy, including in the later postpartum stage.¹

Given the clear evidence of adaptation to pregnancy problems as direct contributors to the establishment of worse bonding²³ and the well-established connection between pregnancy adaptation issues and the development of perinatal depression,²² the possible mediating role of low bonding in the latter relationship between adaptation to pregnancy and perinatal depression must be considered.

Study Aims

The objective of this study was to test the association between symptoms of perinatal depression and poorer adaptation to pregnancy, in which brooding and bonding act as mediating variables in the relationship between poorer adaptation to pregnancy and the development of perinatal depression. Thus, we predicted that poor adaptation to pregnancy would predict elevated levels of brooding and low levels of bonding, which in turn would lead to higher levels of depressive symptoms during the third trimester of pregnancy.

First, previous literature shows that women with poor adaptation to pregnancy may present negative mood states that could lead to depressive symptoms.²² It has been suggested that the appearance of such depressive emotional states would be mediated by the mother's ruminative response style, as a maladaptive emotion regulation strategy in response to problems of adaptation.²⁶ Research has also shown that depressive rumination is a predictor of depressive symptomatology in the last trimester of pregnancy.^{27,34–36} For this reason, a path model was conducted to analyze the hypothesis that poorer adaptation to pregnancy would play an indirect predictive role in perinatal depressive symptom levels through its direct influence on brooding rumination (hypothesis 1, i.e., adaptation to pregnancy → brooding → perinatal depressive symptoms).

Second, studies indicate that mothers with poorer adaptation to pregnancy have greater difficulties in establishing a bonding of quality with their babies.²³ In turn, this mother–baby bond established during pregnancy has been considered a protective factor against the difficulties and/or emotional tensions that could appear during pregnancy or postpartum.¹ Therefore, mothers establishing poorer quality bonding due to the occurrence of problems in adapting to pregnancy would present a greater risk of suffering from depressive symptoms. Based on this, we used the path model to analyze the hypothesis that a poorer adaptation to pregnancy would play an indirect predictive role in perinatal depressive symptoms through its direct influence on a worse maternal–fetal bonding (hypothesis 2, i.e., adaptation to pregnancy → bonding → perinatal depressive symptoms).

Materials and Methods

Design: an online survey was created which included informed consent, and assessment of socio-demographic and psychological variables. For dissemination, the study information and the link to access the survey were shared via social networks. This way, a nondiscriminatory exponential chain sampling procedure (i.e., snowball sampling technique) was used. The inclusion criteria for the study were women over 18 years of age, of Spanish nationality, and in the third trimester of pregnancy. The sample was recruited between November 2021 and February 2022.

Participants: a nondiscriminatory exponential chain-referral sampling procedure (i.e., snowball sampling technique) was performed to recruit the sample between November 2021 and February 2022. The dissemination of the questionnaires was performed through social networks. The inclusion criteria to participate in the study were women over 18 years of age and in the third trimester of pregnancy. An initial sample of 648 was recruited, of which 54 subjects were discarded for not meeting the inclusion criteria. The final sample consisted of 594 women in the third trimester of pregnancy, with 75% of them being primiparous. All the participants were of Spanish nationality. The average number of weeks of pregnancy at the time of participation in the study was 33.26 (standard deviation [SD] = 3.88). The mean age was 32.40 years old (SD = 4.19). Descriptive data of the

sociodemographic characteristics of the participants and dichotomous psychological measures are shown in detail in **Table 1**. All participating women signed an informed consent. The institutional ethics committees approved the study protocol (Universidad Pontificia Comillas). No type of remuneration or incentive was offered to the subjects for their participation.

Instruments: first, the survey included questions about sociodemographic data: age, week of gestation, type of medical care received, marital status, educational level, and nationality. Second, the following questionnaires were used to evaluate the main variables under study (perinatal depression, adaptation to pregnancy, brooding, and bonding quality). Mean and standard deviations of the psychological measures are depicted in **Table 2** (see in the Results section)

Perinatal depression: the Edinburgh Postnatal Depression Scale⁴² has been validated for use in the perinatal stage. This is a 10-item scale and items are rated on a 4-point Likert scale. The cutoff score of ≥ 13 indicates an elevated risk of depression. The Cronbach's α of the Spanish adaptation of the instrument was 0.91⁴³ and in this study it was $\alpha = 0.86$.

Adaptation to pregnancy and the maternal-fetal bonding: these variables were assessed using the Affective Bonding and Prenatal Adaptation Scale,⁴⁴ which has been adapted for its use with pregnant women from the second trimester of pregnancy onward.⁴⁵ It is a 21-item scale (12 items assessing adaptation to pregnancy, 9 items assessing bonding). Items are rated on a 5-point Likert scale. This version presents α coefficients of 0.74 for the adaptation subscale and 0.74 for the bonding subscale. The α coefficients in this study were $\alpha = 0.56$ for the adaptation subscale and $\alpha = 0.73$ for the bonding subscale.

Ruminative responses: we used the Ruminative Response Scale,⁴⁶ which allows the evaluation of individual ruminative response styles, specifically brooding rumination. It is a 22-item scale, with items rated on a 4-point Likert scale. The Spanish adaptation shows a Cronbach's α of 0.93 on the total scale.⁴⁷ The α coefficients in this study were $\alpha = 0.93$ for the total scale and $\alpha = 0.80$ for the brooding subscale.

Other psychological risk factors identified in previous literature (i.e., experience of stressful life events, history of previous depression, general anxiety and social support) were also assessed and controlled for as covariates in the study. All information regarding these variables can be found in the **Supplementary Appendix** (available in the online version).

Table 1 Descriptive data of demographic characteristics and dichotomous psychological measures

Variable	Total sample (N = 594)	
	N	%
Number of children		
0	444	74.6
1	133	22.5
2	14	2.4
3	3	0.5
Educational level (%)		
Primary	23	3.4
Secondary	113	19.0
University graduate	458	77.4
Marital status (%)		
Single	19	3.2
Married or living together	575	96.8
Type of medical care (%)		
Public health care	386	64.8
Health insurance	122	20.7
Private	86	14.5
Previous abortions (%)		
No	585	98.3
Yes	9	1.7
Pregnancy complications (%)		
No	455	76.9
Yes	139	23.1

The Total Scores of Each Instrument Were Used to Compare the Variables with Each Other

Statistical Analyses

Statistical analyses were performed using IBM SPSS Statistics version 22 software. First, descriptive analyses of sociodemographic data and psychological measures of the participants were executed. Second, Pearson bivariate correlation analyses were performed to test the association between the main variables of the model (i.e., adaptation to pregnancy,

Table 2 Mean, standard deviation, and bivariate correlations of psychological variables

Measure r (p-value)	M (SD)	Adaptation to pregnancy	Bonding	Brooding	Perinatal depression
Adaptation to pregnancy	37.17 (4.58)	1			
Bonding	29.61 (4.64)	0.545 ^a	1		
Brooding	3.79 (3.06)	-0.369 ^a	-0.130 ^a	1	
Perinatal depression	8.54 (4.99)	-0.375 ^a	-0.111 ^a	0.528 ^a	1

Abbreviations: M, mean; SD, standard deviation.

^aCorrelations significant at $p < 0.01$.

bonding, brooding, and perinatal depression) and the rest of the dimensional risk factors under study (i.e., general anxiety and social support levels). In accordance with Cohen's⁴⁸ criteria, the following magnitudes were applied in interpreting the results: between ± 0.10 and ± 0.29 low; between ± 0.30 and ± 0.49 medium or moderate; between ± 0.50 and ± 1.0 high correlation.

Finally, we tested a path model using a structural equation that included the full set of variables that were significantly correlated (i.e., adaptation to pregnancy \rightarrow brooding/bonding \rightarrow perinatal depression). In this model, adaptation to pregnancy acted as an exogenous variable, predicting perinatal depression symptomatology levels directly and indirectly through the influence of brooding (i.e., mediator 1) and bonding quality levels (i.e., mediator 2). The estimation of standardized parameters of the path model was conducted using the full information maximum likelihood estimation method. To test model fit, we used standard criteria⁴⁹: (1) χ^2 : nonsignificant value; (2) $\chi^2/\text{g.l.}$: values lower than 2; (3) CFI (comparative fit index) and TLI (Tucker–Lewis index): values ≥ 0.95 ; (4) RMSEA (root mean square error of approximation): values ≤ 0.05 . The hypothesized mediation pathways (i.e., adaptation to pregnancy \rightarrow brooding \rightarrow perinatal depression; adaptation to pregnancy \rightarrow bonding \rightarrow perinatal depression) were tested via estimation of indirect effects within the full path model. Structural equation models and resulting path analyses were conducted using AMOS v18.0 (SPSS).

Results

Descriptive data of the sociodemographic characteristics of the participants and dichotomous psychological measures are shown in [Table 1](#). [Table 2](#) shows the mean (SD) obtained by the sample in each instrument.

Bivariate Correlations

Bivariate correlation analyses showed significant correlations between the main variables under study (i.e., adapta-

tion to pregnancy, brooding, bonding, and symptomatology of perinatal depression), and other of the further risk factors included in the study (general anxiety and social support levels). The full set of correlation results is shown in [Table 2](#).

Structural Equation Model

We tested a structural equation model (see [Fig. 1](#)) including the main variables under study (adaptation to pregnancy, brooding, bonding, and symptomatology of perinatal depression), and modeling the hypothesized relations between them (i.e., indirect effect paths), if they were all significantly correlated in the previous analyses. In this model, a worse adaptation to pregnancy would predict the presence of perinatal depressive symptoms in the third trimester of pregnancy indirectly through two paths of mediation: higher levels of brooding (hypothesis 1) and a worse quality of maternal–fetal bonding (hypothesis 2). All the goodness-of-fit indicators were good, as shown in [Table 3](#).

Indirect effects were then tested using bias-corrected bootstrap estimations (2,000 bootstrap samples with 95% CI). A significant indirect effect of lower adaptation to pregnancy on higher perinatal depressive symptoms via individual differences in brooding ($p = 0.001$; standard error [SE] = -0.172 ; 95% confidence interval [CI]: -0.215 to -0.137) was found, supporting the first hypothesis. Additionally, the indirect effect of lower adaptation to pregnancy on higher perinatal depressive symptoms, via lower maternal–fetal bonding ($p = 0.044$; SE = 0.039 ; 95% CI: 0.007 – 0.072), was statistically significant, thus also supporting the second hypothesis. A graphical representation of the entire path model is provided in [Fig. 1](#).

Discussion

This research aimed to study the pathways through which risk factors explain depressive symptoms in the third trimester of pregnancy, especially the quality with which a woman adapts to her pregnancy. Previous research has focused on the study of sociodemographic and psychological

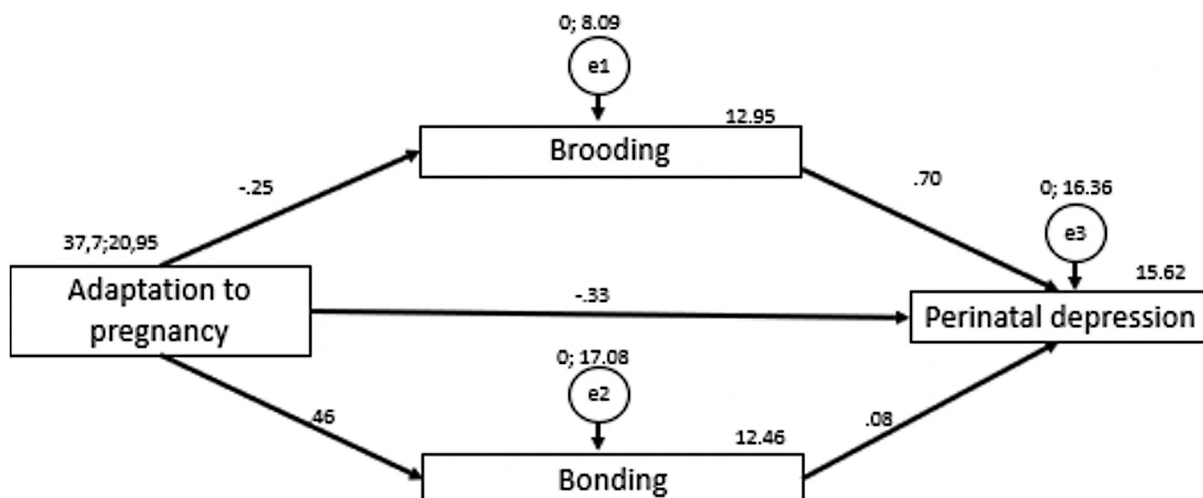


Fig. 1 Path model of the relation between adaptation to pregnancy, brooding, bonding and perinatal depression.

Table 3 Goodness-of-fit indices for the tested path model

	χ^2 (gI)	<i>p</i>	χ^2 /gI	CFI	TLI	RMSEA (90% CI)
Model	1.214 (1)	0.271	1.214	1.000	0.997	0.019 (0.000/0.113)

Abbreviations: CI, confidence interval; CFI, comparative fit index; RMSEA, root mean square error of approximation; TLI, Tucker–Lewis index.

risk factors implicated in the development of perinatal depressive symptoms, such as low socioeconomic status, private medical insurance, and not living with the significant other¹¹; presence of maternal anxiety¹²; previous history of depression^{13,14}; experience of negative stressful life events^{15–17}; and lack of adequate social support network.^{11,17,19,20} However, these previous studies have not considered the further possible pathways for the development of depression, through both individual and relational mechanisms, that can result from the difficulties experienced in adapting to pregnancy. Special attention in this study was therefore paid to the difficulties that some mothers may have in adapting to the changes that their pregnancy entails, since this can influence their use of emotion regulation strategies and the quality of the bond they establish with their babies, both potentially mediating the development of depressive symptoms.

Although the data collected in this study are cross-sectional, which makes it difficult to establish the temporal order of the influences between these factors, in keeping with the main objective, a path was formulated to capture the relationship between these variables. The results obtained in the path model show a clear indirect effect of adjustment to pregnancy on perinatal depressive symptomatology through the mediation of both parenting (hypothesis 1) and low-quality attachment (hypothesis 2).

First, better adaptation to pregnancy was related to women's lower levels of brooding and depressive symptomatology, in line with previous research.²² In turn, more brooding was linked to higher levels of depressive symptomatology in the third trimester of pregnancy, congruent with other studies.^{27,35,36} Path analysis confirmed these relationships, as well as the mediating role of brooding in the relationship between poorer adaptation to pregnancy and higher levels of perinatal depressive symptoms. These results are in line with cognitive theories regarding basic processes leading to depression,⁵⁰ suggesting that a low tolerance to bodily changes and physical discomfort during pregnancy and a significant increase in fears and anxiety in this period (i.e., problems of adaptation to pregnancy) could be equivalent to experiencing pregnancy as a stressful life event or a set of adverse experiences. Such experiences would be associated with the use of a ruminative coping style, in line with the theory of response styles and the empirical research derived from it^{27,28,34–36} that would ultimately contribute to higher levels of perinatal depressive symptoms. In turn, brooding could act as a feedback factor, maintaining the symptoms throughout the final trimester of pregnancy, as well as beyond it in the postnatal period.^{29,30}

Second, the results also supported the conclusions of Hidalgo and Menéndez,²³ that a more satisfactory adaptation

to pregnancy is related to a higher quality of bonding during pregnancy. Thus, results suggest that if the mother accepts the changes she experiences during pregnancy, she will develop an adequate maternal response toward the baby from her earliest interactions.⁵¹ Higher levels of bonding were associated with lower levels of brooding and depressive symptomatology. Path analysis confirmed these relationships, as well as the mediating role of lower quality bonding in accounting for the relationship between poorer adaptation to pregnancy and higher levels of perinatal depressive symptoms. However, the direction of the relationship between bonding and perinatal depressive symptoms would be inverse to that considered in other research that have rather considered bonding problems as a consequence of perinatal depression,^{10,40,41} thus suggesting an alternative model in which the quality of bonding could also be considered a protective factor during pregnancy against the difficulties and/or tensions that may arise, including increases in perinatal depression in the third trimester of pregnancy.¹

Limitations and Strengths

This study has some limitations. First, the measurement instruments used were self-report questionnaires, and doing it online made it impossible to guarantee that participants completed them in optimal circumstances and times. Moreover, the internal consistency of the adaptation to pregnancy subscale was relatively low (obtaining a Cronbach's α of 0.58). Given the importance of this risk factor, this makes it important to replicate our findings with other instruments assessing adaptation to pregnancy that have better psychometric properties. It is also important to consider the global pandemic situation caused by COVID-19 occurring at the time of data collection for this study and how this may have influenced the characteristics of the sample. Indeed, the prevalence of depressive symptomatology in our sample, representative of the population studied, was twice as high in pregnant women compared with prepandemic data.⁸

As for the strengths of the study, the sample size was high considering that this type of population is usually less likely to participate in studies of this nature given the state of gestation. In turn, the results obtained belong to a representative sample of the population, as can be seen in the percentage of participants with depression during pregnancy (21% of the sample exceeded the cut-off point for perinatal depression) and can therefore be generalized to the entire population of pregnant women in the third trimester of pregnancy. Finally, the results support an alternative direction to the one typically considered in the literature, in the relation between the quality of bonding and perinatal depressive symptoms, such as assessing the influence of individual process variables in the

development of depressive symptomatology in pregnancy, as in the case of brooding.

Implications

These findings are highly informative and can be taken as a starting point for the development of longitudinal studies, with the aim of confirming the temporal relationship between these variables to improve knowledge about the risk factors present in the final period of pregnancy and their subsequent influence on postpartum mood and adaptation to motherhood.

Continuing in this direction, correct identification and early detection are framed as fundamental aspects for future prevention and treatment.

Similarly, the development of new strategies to reduce the occurrence of early mood problems during pregnancy should be considered essential, particularly through the development of preventive interventions against melancholic rumination and to prevent difficulties in establishing maternal–fetal bonding.

Our results show that it is also important in this type of interventions to consider the style of the woman's attachment bond with her own mother, since this is an essential component for the development of maternal identity.

Conclusion

The negative feelings a woman may have in adapting to the changes produced by her pregnancy, leading to an unsatisfactory experience of it, can act as a risk factor for the onset of perinatal depressive symptoms in the third trimester of pregnancy. This relationship would be mediated by two factors, the presence of brooding and a low quality of the maternal–fetal bond. Poor adaptation to pregnancy could predict a maladaptive coping style in the mother, comprising a higher use of brooding rumination, in turn predicting depressive symptoms. Lower adaptation to pregnancy would also influence the adequate establishment of good-quality bonding, reducing its protective effect against the development of perinatal depressive symptoms. This model provides a new direction of interpretation of the relationship between bonding and perinatal depressive symptoms, as well as identifies new risk factors that can improve the adequate detection and prevention of perinatal depressive symptoms in the third trimester of pregnancy.

Authors' Contributions

M.V.-S.: conceptualization, methodology, investigation, formal analysis, data curation, writing—original draft and editing. R.R.S.: formal analysis and data curation. A. B.: conceptualization, methodology, writing—review and editing. A.S.L.: conceptualization, methodology, writing—review and editing.

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Conflict of Interest

None declared.

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