Dysfunctional Beliefs Towards Parenthood and Depressive Symptoms: A Dyadic Response Surface Analysis (DRSA) Approach

Martina Gallo[1], Maria Cristina Gugliandolo[2], Francesca Liga[2], Sarah Galdiolo[3]

[1] Centre for Research and Psychological Intervention (Ce.R.I.P.), University of Messina, Messina, Italy

[2] Department of Clinical and Experimental Medicine, University of Messina, Messina, Italy

[3] Department of Clinical Psychology, University of Mons, Mons, Belgium

Correspondence concerning this article should be addressed to Maria Cristina Gugliandolo, Department of Clinical and Experimental Medicine, University of Messina, Messina, Via Bivona, 5, 98122 Messina, Italy.

Email: mariacristina.gugliandolo@unime.it

ORCID: 0000-0002-1189-6960

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Abstract

Based on Beck's cognitive theory, the present study sought to examine the extent to which the degree of (dis)similarity between partners in specific beliefs about parenting (i.e., others' judgments, parental responsibility, parental role idealization) may be associated with their levels of depression. One hundred and seventy couples of expectant mothers and fathers in stable relationships took part in this study and Dyadic Response Surface Analysis (DRSA) approach was used. The results showed (a) a predominant actor effect of the personal beliefs related to others' judgments and parental responsibility on depressive symptoms, for both partners, and (b) a congruence effect, suggesting that a greater similarity between maternal and paternal beliefs related to the responsibility was negatively associated with paternal depressive symptoms. These findings highlight that the psychological risk of depressive symptoms during pregnancy may be particularly influenced by individual factors, such as cognitive style. At the couple level, the fathers felt more responsible for their role and reported greater pressure and expectations of their responsibilities when their partner had dysfunctional maternal beliefs. The link between dysfunctional beliefs and depressive symptoms may be an important contribution to identifying parents at risk of psychological distress during pregnancy.

Keywords: beliefs, depression symptoms, response surface analysis, pregnancy, dyadic data

Introduction

Pregnancy and the birth of a first child have predominantly positive connotations for future parents (Galdiolo & Roskam, 2012). However, the transition to parenthood is also a stressful period in life characterized by numerous changes and, in some cases, a real crisis, and can be associated with a risk of depressive symptoms (Gillis et al., 2019). An important public health concern is the identification of vulnerability factors for parental prenatal depression (Leach et al., 2018). The psychological adjustment of future parents during this period is an important predictor of parents' postnatal adjustment, which in turn is associated with the child's psychological development (Brenning et al., 2015). Psychological problems can impact cognitive, emotional, motivational, attitudinal, and behavioral systems, all of which affect health in some way. However, it is only recently that research has begun to focus on investigating cognitive vulnerabilities and processes possibly associated with pregnancy disorders (Fonseca et al., 2018). This is more fully conceptualized in Beck's cognitive model of depression (Beck, 1967; Crisp & Gabbard, 2022), which suggests that negative beliefs (e.g., about the self, world, and future) underlie the development of depression. According to this model, people at risk of depression have maladaptive cognitive schemas that are relatively stable and lay silent until triggered by stressful life events (Leach et al., 2018), and the relationship between life events (e.g., pregnancy) and emotional experiences (e.g., depressive symptoms) is supposedly mediated by cognitive processes.

In the transition to parenthood, when activated by stressful events such as pregnancy, dysfunctional beliefs can influence how individuals cope with this prenatal period, surfacing dysfunctional attitudes that play an important role in the onset or maintenance of depressive symptoms (Sockol et al., 2014). In other words, if an individual's cognitive model of motherhood and fatherhood is distorted or dysfunctional, the transition to parenthood will be experienced negatively, and the resulting emotional distress may be greater.

Although much of the research on cognitive vulnerability to depression has focused on general negative biases, there is also evidence that specific cognitions can interact with stressors to produce maladaptive emotional responses (Sockol & Battle, 2015). Specific cognitions are domain-specific beliefs related to a topic and can only predict responses in that context, such as parenting. This suggests that some dysfunctional or maladaptive beliefs about parenthood may be associated with an increased risk of depression during the perinatal period (Leach et al., 2018). In line with Beck's model, Sockol et al. (2014) identified dysfunctional beliefs about parenting that, in interaction with specific stressful events, constitute a vulnerability to depression. These beliefs are related to (a) others' judgments, (b) parental responsibility, and (c) parental role idealization. The first refers to beliefs related to the perception of how others will judge one's performance as a parent (good or bad); the second refers to beliefs related to the perception of the demands of the parental role in terms of total commitment and availability; the last belief system is related to the evaluation of the parental experience as an exclusively positive experience that does not allow for mistakes or negative feelings. Although this line of research is ongoing, more attention has historically been paid to mothers. Many men experience depression and distress during the transition to parenthood, but the characteristics associated with fathers' distress are relatively less well known. This is unfortunate, as the perspectives of both partners may also help to explain individual and couple differences in the perinatal period (Gugliandolo et al., 2021). This period is a different transition for each parent; the father's role is different, and within heterosexual relationships, there are still strong social and relational pressures for men to perform well, typically in the form of provision and support (Katz-Wise et al., 2010). It is therefore important to consider the transition to parenthood from an individual perspective.

In the early stages of parenthood, changes are most likely to be linked to an individual experience (Porat-Zyman et al., 2017). As beliefs are tied to one's role as a parent, each

partner may be uniquely oriented by their own cognitive style and consider their own beliefs independently of their partner's. However, individuals within a dyad are inherently interdependent. Therefore, it is possible that the experience of the transition to parenthood may be related not only to one's own experience of parenthood over time but also to one's partner's experience of parenthood (Le et al., 2016). For a more complete understanding of couple dynamics, it may be crucial to explore the role of similarity and dissimilarity between partners. In contrast to similarity, partner dissimilarity may be more problematic for a partner who does not share the same parenting beliefs or basic assumptions about parenting, and this may increase the risk of emotional distress within the couple. This need is both theoretical and practical. It is increasingly recognized that men may also experience significant psychological distress during this period and that this distress may have important consequences not only for the men concerned but also for their children and families (Sockol & Allred, 2018). In addition, a better understanding of the correlates of psychological distress in both mothers and fathers and the mechanisms by which these characteristics may contribute to the development of symptoms has the potential to inform prevention, screening, and interventions specific to this population. This suggests that it would be useful to develop specific measures and interventions to address the needs of new and prospective fathers rather than replicating what already exists for mothers.

The prenatal period has significant implications for dyadic adaptation and parenting (Glover & Capron, 2017). To date, most studies have adopted an individual perspective and have mainly involved mothers. However, there are several reasons for adopting a dyadic approach to studying the transition to parenthood: first, to account for the complex interplay between paternal and maternal psychological states and the interdependence that exists between members of the dyad (Kenny et al., 2006); second, to consider that partners face an inherently shared stressor—the transition to parenthood (Baldoni et al., 2020); and finally, the

importance of including fathers in perinatal research (Paulson & Bazemore, 2010). Kenny and Ledermann (2010) have shown that it is essential to use a dyadic approach when studying couples because reciprocal associations between partners are integrated as both partners influence each other with their behaviors, thoughts, feelings, and well-being.

The Present Study

The present study aimed to examine whether congruence and incongruence in expectant mothers' and fathers' reports of specific beliefs about parenting (i.e., others' judgments, parental responsibility, parental role idealization) are associated with depressive symptoms in both partners. For this reason, the main research questions of the present study were: (1) Is the individual's level of dysfunctional beliefs associated with the individual's levels of depressive symptoms (i.e., actor associations)? (2) Is the individual's level of dysfunctional beliefs associated with the partner's levels of depressive symptoms of the partner (i.e., partner associations)? And (3) is the similarity or dissimilarity between partners per the level of dysfunctional beliefs associated with the level of depressive symptoms in both partners? To answer these questions, a specific dyadic model was tested for each of the parenting beliefs, with personal and partner reports of the specific cognitive style and their interactions correlated with depressive symptoms in both partners.

Method

Participants

One hundred and seventy couples expecting a child participated in this study. Expecting mothers (age: M= 32.18, SD = 4.88) and fathers (age: M= 34.86, SD= 5.16). The mean duration of the relationship between the two partners was 8.34 years (SD = 4.58) had no previous children (primiparous parents), and 67% of parents are married and 33% are cohabiting. The mean duration of the relationship between the two partners was 8.34 years

(SD = 4.58). With regard to education qualifications, 8% of mothers had a middle school diploma, 40% a high school diploma, 42% a first level degree, 8% a post-degree and 2% indicated “other”; fathers had 9% of a middle school diploma, 61% a high school diploma, 32% a first level degree, 5% a post-degree and 1% indicated “other”. The expectant mothers were mainly in the last trimester of pregnancy (M = 7.66, SD = 1.22), 60% of them reported no problems during pregnancy, 32% mild pathologies, 5% serious illness, with bed rest for one or more weeks, without hospitalisation, 1% serious illness, with recourse to the first aid, and 1% serious illness, with hospitalization.

Procedure

Parents in this study were recruited through collaboration with clinics and hospitals that offer courses in preparation for childbirth or gynaecology services and pregnancy support services. Participants who agreed to take part in the research completed a paper questionnaire separately from their partner, under the supervision of a graduate psychology trainee, to ensure that couples completed the measures independently. At the time of filling in the questionnaires, both partners were given an anonymous identification code, which allowed the data provided by both partners to be linked. They received no form of compensation for their participation. The confidentiality and privacy of the participants was guaranteed throughout the research process. The research was approved by the Local Ethics Committee Board and adhered to the ethical standards outlined in the Helsinki Declaration.

Measures

Attitudes Toward Parenthood Scale

Parental attitudes were assessed using the Attitudes Towards Motherhood Scale (AToM; Sockol et al., 2014) and the Attitudes Towards Fatherhood Scale (AToF; Sockol & Allred, 2018). Following the recommendations of the International Test Commission

(Hambleton, 2001), the version of the AToM and AToF was developed using the back-translation method in combination with the committed method (Erkut, 2010; Peña, 2007). Both measures consist of 12 items, answered on a 6-point Likert scale (always disagree to always agree), with higher scores representing more negative and dysfunctional forms of parental attitudes (Sockol et al., 2014; Sockol & Allred, 2018). They explore three different areas regarding attitudes towards parenthood: beliefs related to others' judgments (e.g., "People will probably think less of me if I make parenting mistakes"), beliefs related to parental responsibility (e.g., "If I love my baby, I should want to be with him/her all the time"), beliefs regarding parental role idealization (e.g., "It is wrong to have mixed feelings about my baby"). The AToM and AToF have been shown to be valid and reliable measures of parental attitudes related to perinatal depression. The scales have been tested with perinatal samples and have good psychometric properties (Sockol et al., 2014; Sockol & Battle, 2015; Sockol & Allred, 2018). The reliability and validity of AToM and AToF have been documented extensively (Fonseca & Canavarro, 2018; Fonseca et al., 2018; Leach et al., 2018), and internal consistency in this study was adequate (Table 1).

Center for Epidemiologic Studies Depression Scale

Parents' depressive symptoms were assessed using the Version of the Center for Epidemiologic Studies Depression Scale (CES-D; Bohannon et al., 2003; Fava, 1983; Radloff, 1977). The scale consists of the 20-item on a four-point Likert scale ranging from 0 (Not at all or less than 1-day last week) to 3 (Most/all of the time, 5–7 days last week). Using the CES-D, participants rated how often they had experienced cognitive, somatic, and psychological symptoms of depression during the previous week (e.g., 'During the past week, I felt sad'). These components included: depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor retardation, loss of appetite, and

sleep disturbance. The psychometric characteristics of the CES-D have been well showed in previous studies (Olino et al., 2012; Radloff, 1991), and have been documented extensively in the perinatal literature (Baldoni et al., 2020; Brenning et al., 2015; Gugliandolo et al., 2021; Hall et al., 2014; Reut & Kanat-Maymon, 2018). Internal consistency in this study was adequate and has been reported in the Table 1.

Data Analysis

Preliminary analyses were conducted for all study variables, calculating descriptive statistics and Pearson's correlations. R studio was used to test the DRSA, applying the source code defined by Schönbrodt et al. (2018), which integrates the packages lavaan (Rosseel, 2012) and RSA using maximum likelihood estimators (ML) and the listwise method to deal with missing values. Dyadic response surface analysis (DRSA; Schönbrodt et al., 2018) is a statistical approach to assess actor, partner, and the congruence/incongruence between actor and partner. This process makes it possible to combine the Actor-Partner Interdependence Model (APIM) and the Response Surface Analysis (RSA), to test the (dis)similarity between two predictors and two outcomes within a dyad. DRSA has been shown to be a good way to investigate dyadic (dis)similarity effects, as it allows one to test whether being similar or dissimilar to one's romantic partner regarding the levels of a variable is associated with the levels of another variable of both partners (Weidmann et al. 2017). In this study, DRSA was used to examine the role of dyadic (dis)similarity between partners on specific beliefs about parenthood with their level of depression. In sum, DRSA involves two steps. The first is to run a polynomial regression model: regressing the outcome on the main effects of X and Y, their squared terms (X^2 and Y^2), and the interaction term (X * Y). The second is to use the effects from this model to generate a response surface and test whether and how mis(matches) matter. DRSA automatically provides four coefficients for mothers (a1m, a2m,

a3m, a4m) and for fathers (a1f, a2m, a3f, a4f), respectively, that answer unique questions about the importance of (mis)matches (Barranti et al., 2017). These coefficients allow the interpretation of responses in terms of line of congruence (LOC) and line of incongruence (LOIC). Furthermore, to fully understand patterns of (dis)similarity, parameters cannot be interpreted in isolation, but the overall pattern of results must be assessed (Humberg et al., 2019). In addition, to avoid a self-referential interpretation of the coefficients, two check list were developed to test the hypotheses of congruence and incongruity. These two checklists make it possible to test the congruence hypothesis, which states that an outcome variable is higher, the closer the two predictor variables are to one another and the "reverse" congruence hypothesis, namely, which states that the outcome variable is lower for more congruent predictors (Humberg et al., 2019; Schönbrodt et al., 2018). Evidence of a congruence effect would be found if p10 is not significantly different from 0 ($p10 \approx 0$), the confidence interval of p11 include 1 ($p11 \approx 1$), a4 is significantly negative ($a4 < 0$), a3 is not significantly different from 0 ($a3 \approx 0$), while the "reverse" congruence effect would be found if p20 is not significantly different from 0 ($p20 \approx 0$), the confidence interval of p21 include 1 ($p21 \approx 1$), a4 is significantly positive ($a4 > 0$), a3 is not significantly different from 0 ($a3 \approx 0$) (Humberg et al., 2019; Schönbrodt et al., 2018).

Results

Descriptive Statistics and Preliminary Analyses

The descriptive statistics, Cronbach's alpha values, and correlations for the study variables are presented in Table 1.

Correlation analysis has shown that maternal beliefs related to others' judgments were positively and significantly correlated with maternal depressive symptoms and paternal beliefs related to others' judgments. Similarly paternal beliefs related to others' judgments

were positively and significantly correlated with depressive symptoms. Beliefs related to maternal responsibility were positively and significantly correlated with maternal depressive symptoms, paternal depressive symptoms, and beliefs related to paternal responsibility. In addition, Beliefs related to paternal responsibility were positively and significantly correlated with paternal depressive symptoms. Furthermore, beliefs related to maternal role idealization were positively and significantly correlated with beliefs related to paternal role idealization. Finally, maternal depressive symptoms were positively and significantly correlated with paternal depressive symptoms.

Dyadic Response Surface Analysis

In line with the interpretation guidelines for DRSA (Barranti et al., 2017; Schönbrodt et al., 2018), the results are presented from Table 2 to 7. In addition, to avoid a self-referential interpretation of the coefficients, considering that (dis)similarity patterns cannot be inferred from the interpretation of single coefficients in isolation, a checklist developed to test the congruence and the "reverse" congruence hypothesis was applied (following the indications of Humberg et al. 2019). The results are shown in Table 8.

In the relationship between both partners' beliefs related to others' judgments and their levels of depressive symptoms, this result suggests an actor effect, with a positive association between personal beliefs and their levels of depressive symptoms (Table 2). Instead, the congruence of the beliefs related to others' judgments scores significantly predicted the mother's (a1m) and father's (a1f) depressive symptoms, such that the mother's and father's levels of depression appear to increase when dysfunctional belief scores are high (Table 3). However, the presence of only these coefficients significant (a1m for mothers and a1f for fathers), suggests a predominant actor effect, with the personal level of dysfunctional beliefs rather than similarity between partners, to be positively associated with depressive

symptoms in mothers and fathers. In addition, the results of the Humberg checklist showed that in the relationship between beliefs related to others' judgments and depressive symptoms, for both mothers and fathers, only their own level of dysfunctional beliefs was a significant predictor of depressive symptoms (Table 8). In sum, the integration of the results of all these coefficients suggests that there is not a pattern of (dis)similarity in beliefs related to others' judgments that can have a stronger association with the partners' depressive symptoms.

In the relationship between both partners' beliefs related to parental responsibility and their levels of depressive symptoms, this result suggests actor effect, with a positive association between partners' beliefs and their levels of depressive symptoms (Table 4). These results also showed interaction effects between maternal and paternal beliefs related to parental responsibility as potentially relevant for promote depressive symptoms in both partners. Instead, the congruence of the beliefs related to parental responsibility scores significantly predicted the mother's (a1m) and father's (a1f) depressive symptoms, such that the woman's and man's levels of depression appear to increase when the dysfunctional belief scores are high (Table 5). Two further coefficients were observed: a3m for mothers, where depressive symptoms are higher when Beliefs related to maternal responsibility are more dysfunctional than beliefs related to paternal responsibility; a4f for fathers, where depressive symptoms are higher the more beliefs related to maternal responsibility and beliefs related to paternal responsibility match one another (Table 5). However, Humberg's checklist support an effect of similarity between mother and fathers in the beliefs related to parental responsibility only for the fathers' depressive symptoms, while the identification of (dis)similarity in beliefs related to parental responsibility is not supported for maternal depressive symptoms. Indeed, p10 isn't significant (p= .26), the confidence interval of p11 doesn't exclude 1 (CI. Low= -.26, CI. Upp= 1.80), a4 is significantly negative (est= -.11, p= .02), a3 isn't significant (p=.29). All four necessary conditions for a congruence effect are

satisfied for the paternal depressive symptoms, suggesting that the level of depression of fathers is higher when both partners have similar scores of beliefs related to parental responsibility (Table 8). The actor association for maternal depression, instead suggest that are the maternal beliefs related to parental responsibility to be associated with the maternal levels of depressive symptoms.

In the relationship between both partners' beliefs related to parental role idealization, no significant results were observed (Table 6 and 7).

Discussion

Most of the literature on parenting has focused on postnatal factors to explain parental functioning (Baldoni et al., 2020). The results of the present study support the importance of considering the prenatal period to better understand prenatal depression.

In line with the literature, the results of the present study suggest that parental beliefs are associated with depressive symptoms during pregnancy (Fonseca et al., 2018). There are specific risk factors in the prenatal period that can increase the risk of distress and malaise in both partners. Beliefs related to others' judgments and to parental responsibility appeared to increase the risk of depressive symptoms, extending what was found in the prior literature not only for mothers but also for fathers. These beliefs are particularly related to the perception that one is only valuable as a person if one is a good parent and if one is able to perform the tasks that are relevant or expected in relation to the parental role (Blissett & Farrow, 2007). They also imply high performance standards linked to the myth of "perfect" motherhood or fatherhood, which can lead to the fear of criticism and failure (Fonseca et al., 2018), and this probably contributes to the condition of higher depressive states. In fact, these beliefs create unrealistic expectations that increase the tension experienced by parents. Expecting to be unable to fulfil one's parental role, being more vulnerable to negative judgements and

evaluations from others, and seeing oneself as totally responsible can make mothers and fathers more apprehensive about the upcoming parental role. Parents may convince themselves that they are not as worthy as others, that they have no hope for the future, and that they will not be able to commit to and cope with the tasks that parenthood will bring. This might make parents more vulnerable to conventionally imposed responsibilities and external criticism.

Beliefs related to others' judgments are personal beliefs about how others perceive and judge a parent. The results of this study show that these beliefs can increase the risk of depressive symptoms perhaps because they are dichotomous beliefs in which mothers and fathers perceive that their self and their performance are divided into rigid and opposite categories (Leach et al., 2018): Either one is a good parent, with the "right" behaviors related to the parental role, oriented towards success, or one is a bad parent, with the "wrong" behaviors, oriented towards failure. These beliefs fail to recognize the diversity of parental experience, and if one does not fall into the "good parent" category, they can affect self-esteem, with affected individuals automatically perceiving failure. In fact, polarized thinking is common in people with depression, causing depressed parents to feel insecure about their abilities and worth (Beck & Haigh, 2014; Peifer et al., 2022) because beliefs related to others' judgment imply an evaluative image component that does not allow for mistakes and imposes high standards of performance (Sockol & Battle, 2015). Furthermore, these beliefs can lead to a strong desire to conform to social expectations in order to avoid being judged negatively. This can limit individual expression and personal freedom, increasing the perception of discomfort and the risk of depressive symptoms.

Beliefs related to parental responsibility are personal beliefs about the sense of obligation or duty that mothers and fathers have regarding thoughts, emotions, and behaviors related to the parental role (Kim & Kang, 2019). These beliefs also increase the risk of

depressive symptoms in both mothers and fathers. It is likely that when these beliefs are rigid, parents feel overburdened with their duties and role in their children's growth and well-being. Related behavior becomes dysfunctional when individuals believe they are alone and do not recognize the potential role of external factors, such as society or the family of origin. These beliefs related to parental responsibility during pregnancy therefore relate to the expectations and conviction that parents develop about how they “should” behave and what they should do to be "perfect" in their parental role.

Parental responsibility refers to the perfectionist behavior expected of parents and emphasizes the sense of responsibility in terms of total commitment and availability (Fonseca et al., 2018). This therefore exposes parents to the search for perfect motherhood and fatherhood. Over time, however, the constant pressure to ensure that everything appears perfect can increase the risk of feeling unwell. This may be because any difficulties or failures are likely to be colored by a sense of guilt that helps to fuel the drive towards perfectionist behavior, where any mistake is seen as a catastrophic failure (Ayers et al., 2019). Therefore, feeling constantly responsible for everything can lead to emotional exhaustion also because of the difficulty in asking for help and the constant feeling of not doing or being enough.

Still, no evidence of an association between beliefs related to the idealization of the parental role and malaise exists (Fonseca & Canavarro, 2018); presumably, this dysfunctional belief system is less related to the personal worth of women and men and relates to the daily practice of parenting, which has arguably not started yet during pregnancy. Thus, future parents seem to be more susceptible to the judgement of others and to the responsibility of their parental role. During pregnancy, a process begins that leads to the achievement of parental identity (Mercer, 2004), so it is likely that mothers and fathers are more exposed to the judgments of others or to the weight of responsibility rather than idealizing a role that is

still distant. These two beliefs are already present before childbirth and can help explain how maternal and paternal adjustment occurs during the transition to parenthood.

Regarding beliefs about others' judgements and parental responsibility, the results of this study suggest that only the personal level of dysfunctional beliefs is positively related to the risk of depressive symptoms. This seems to suggest that for each partner, the psychological risk of depressive symptoms can be particularly impacted by personal dysfunctional beliefs. This is important because it shows that the transition to parenthood during pregnancy is influenced by several individual factors, including cognitive factors. Pregnancy can be a challenging time; it involves a major cognitive and life reorganization which, in some cases, can lead to increased vulnerability to psychological distress in both mothers and fathers (Gugliandolo et al., 2021). Furthermore, these dysfunctional beliefs may be a risk factor for adjustment problems and negative parenting attitudes in both parents not only during pregnancy but also in the postnatal period (Pinto et al., 2020). Thus, these cognitive factors need to be considered early on during pregnancy since prenatal psychological adjustment is an important predictor of postnatal parental adjustment and functioning, which in turn is related to the psychological development of the child (Brenning et al., 2015).

Clarifying the contribution of different cognitive vulnerability markers represents an important direction for both future research and clinical practice (Dozois & Beck, 2008). However, some differences can be identified, and our findings suggest an important facet in relation to the congruence effects obtained. The congruence of beliefs about parental responsibility was found to be associated with depressive symptoms in fathers such that the men's levels of depression appeared to increase when both mothers and fathers endorsed high levels of dysfunctional beliefs. These findings might provide insight into the risk of depressive symptoms in fathers. Expectant fathers are particularly worried about the

responsibilities involved in having and raising a child (Goldberg, 2014); it is not surprising that men with high levels of cognitive distortions report depressive symptoms (Sockol & Allred, 2018). The observed congruence effect can be explained by the fact that most studies report that the risk of paternal depressive symptoms is associated with the quality of the relationship with the partner (Singley & Edwards, 2015). Indeed, men are typically socialized to rely heavily on their intimate partners to ensure their psychological well-being (Singley & Edwards, 2015). This may make men more sensitive to the congruence between maternal and paternal beliefs about parenting in a socio-cultural context that recognizes the father's role as no longer secondary but central to parenting (Goldberg, 2014; Singley & Edwards, 2015).

Applying the cognitive model to pregnancy highlights how important the analysis of specific beliefs can be in understanding the relationship between risk factors and depressive symptoms during pregnancy (Fonseca & Canavarro, 2018). Applying this model to pregnancy means examining the dysfunctional beliefs that parents may hold during this period. Individual beliefs include individuals' characteristic ways of thinking about events that predispose them to specific emotional responses in the context of potentially stressful life events. Given the major life changes associated with the transition to parenthood, it is not surprising that parents with dysfunctional beliefs report higher levels of depressive symptoms.

This study had some limitations, however. The cross-sectional design did not allow for causal inferences to be drawn between the variables analyzed. It is possible that depressive symptoms can contribute to the development of dysfunctional attitudes. Future research is needed to determine whether maladaptive beliefs precede the development of depressive symptoms with periodic measurements both in the pre- and post-partum stages. In addition, future research might verify the results observed with larger and more heterogeneous samples. The selection of the sample from clinics and hospitals that offer

courses in preparation for childbirth, the sole participation of heterosexual couples, and that the sample was restricted to the XXX limit the generalizability of the results. Also, only self-report instruments were used in this study. The results obtained may be inflated due to reporter bias. It is important to combine specific and regular measurements during the antenatal and postnatal periods, including partner reports and clinical interviews.

Implications

This study has important practical implications, though. The link between dysfunctional beliefs and depressive symptoms may be an important contribution to identifying parents at risk of psychological distress during pregnancy. A large body of literature (Anokye et al., 2018; Dennis & Dowswell, 2013) offers preventive interventions for depressive symptoms, and parents with dysfunctional beliefs may benefit from these interventions. These findings also suggest that it may be useful to develop specific interventions with a dyadic approach because the father is sensitive to the mother's beliefs. There are few interventions that address perinatal distress in men, and it is difficult to assess the effectiveness of these interventions due to methodological limitations in the existing literature or because most of these interventions were developed for their respective partners (Rominov et al., 2016).

Overall, many researchers have started to study the processes involved in parents' experiences during pregnancy, emphasizing how this period of the life cycle is not a moment of waiting in a vacuum from a psychological point of view but an experience that demands significant attention from both parents in a dyad (Kerstis et al., 2016).

Data Availability Statement

The data that support the findings of this study are available from the corresponding author.

Disclosure Statement

The authors report there are no competing interests to declare.

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Table 1.

Descriptive analyses and correlations

	Min	Max	M	SD	Skew	Kurt	α	1	2	3	4	5	6	7
1. Maternal beliefs related to others' judgments	1.00	5.00	1.75	.94	1.52	2.07	.83	-						
2. Beliefs related to maternal responsibility	1.00	6.00	2.74	1.05	.72	.23	.71	.29**	-					
3. Beliefs related to maternal role idealization	1.00	5.75	3.21	1.13	.01	-.81	.66	.17*	.41**	-				
4. Maternal depressive Symptoms	1.05	2.90	1.71	.36	.81	.84	.80	.30**	.34**	.14	-			
5. Paternal beliefs related to others' judgments	1.00	5.50	1.66	.89	1.87	3.86	.79	.39**	.29**	.18*	.28**	-		
6. Beliefs related to paternal responsibility	1.00	6.00	2.92	1.21	.69	.11	.74	.15	.49**	.24**	.18*	.26**	-	
7. Beliefs related to paternal role idealization	1.00	6.00	3.35	1.27	.04	-.86	.70	.11	.19*	.42**	.04	.11	.18*	-
8. Paternal depressive Symptoms	1.00	3.35	1.55	.43	1.55	2.75	.86	.07	.18*	.14	.39**	.36**	.21**	.10

Note. N = 170; Min = Minimum; Max = Maximum: M = Mean; SD = Standard Deviation; Ske = Skewness; Kur = Kurtosis; α = alpha *di Cronbach*; **p < .01; * p < .05.

Table 2

Coefficients of the regression analysis between parental beliefs related to others' judgments on maternal and paternal depressive symptoms

Label	b	*p*	95%CI		β
			CI. Low	CI.Upp	
Outcome maternal depressive symptoms					
Maternal beliefs related to others' judgments (b1m)	.13	.00	.05	.22	.35
Paternal beliefs related to others' judgments(b2m)	.03	.57	-.07	.13	.07
Squared maternal beliefs related to others' judgments (b3m)	-.02	-1.00	-.07	.02	-.12
Interaction of the beliefs related to others' judgments (b4m)	-.04	.33	-.11	.04	-.11
Squared paternal beliefs related to others' judgments (b5m)	.04	.12	-.02	.09	.22
Outcome paternal Depressive Symptoms					
Maternal beliefs related to others' judgments (b1f)	-.07	.20	-.17	.03	-.14
Paternal beliefs related to others' judgments (b2f)	.17	.01	.05	.31	.34
Squared maternal beliefs related to others' judgments (b3f)	.01	.75	-.05	.07	.04
Interaction of the beliefs related to others' judgments (b4f)	.04	.37	-.05	.13	.10
Squared paternal beliefs related to others' judgments (b5f)	.00	.93	-.09	.07	.02

Table 3

Coefficients of the Dyadic Response Surface Analysis between parental beliefs related to others' judgments on maternal and paternal depressive symptoms

Label	Parameter	b	*p*	95%CI		β
				CI. Low	CI.Upp	
Outcome maternal depressive symptoms						
Line of congruence	a1m	.16	.02	.03	.29	.42
Curvilinearity in line of congruence	a2m	-.02	.72	-.09	.08	-.01
Line of incongruence	a3m	.11	.12	-.04	.23	.28
Curvilinearity in line of incongruence	a4m	.06	.46	-.11	.19	.21
Outcome paternal depressive symptoms						
Line of congruence	a1f	.10	.19	-.05	.26	.20
Curvilinearity in line of congruence	a2f	.05	.28	-.05	.14	.16
Line of incongruence	a3f	-.23	.01	-.42	-.07	-.49
Curvilinearity in line of incongruence	a4f	-.03	.76	-.20	.14	-.05

Table 4

Coefficients of the regression analysis between parental beliefs related to parental responsibility on maternal and paternal depressive symptoms

Label	b	*p*	95%CI		β
			CI. Low	CI.Upp	
Outcome maternal depressive symptoms					
Beliefs related to maternal responsibility (b1m)	.11	.00	.05	.16	.31
Beliefs related to paternal responsibility (b2m)	.00	.99	-.05	.05	.00
Squared beliefs related to maternal responsibility (b3m)	-.02	.38	-.07	.03	-.10
Interaction of the beliefs related to parental responsibility (b4m)	.05	.02	.01	.10	.23
Squared beliefs related to paternal responsibility (b5m)	.00	.84	-.03	.03	.02
Outcome paternal Depressive Symptoms					
Beliefs related to maternal responsibility (b1f)	.03	.44	-.05	.10	.07
Beliefs related to paternal responsibility (b2f)	.09	.01	.03	.15	.24
Squared beliefs related to maternal responsibility (b3f)	-.02	.63	-.08	.05	-.05
Interaction of the beliefs related to parental responsibility (b4f)	.06	.04	.00	.13	.22
Squared beliefs related to paternal responsibility (b5f)	-.03	.17	-.08	.02	-.17

Table 5

Coefficients of the Dyadic Response Surface Analysis between parental beliefs related to parental responsibility on maternal and paternal depressive symptoms

Label	Parameter	b	*p*	95%CI		β
				CI. Low	CI.Upp	
Outcome maternal depressive symptoms						
Line of congruence	a1m	.11	.00	.05	.17	.31
Curvilinearity in line of congruence	a2m	.04	.10	-.01	.08	.15
Line of incongruence	a3m	.11	.03	.01	.20	.31
Curvilinearity in line of incongruence	a4m	-.08	.15	-.19	.02	-.30
Outcome paternal depressive symptoms						
Line of congruence	a1f	.11	.00	.04	.19	.30
Curvilinearity in line of congruence	a2f	.02	.65	-.04	.10	.00
Line of incongruence	a3f	-.06	.32	-.18	.05	-.17
Curvilinearity in line of incongruence	a4f	-.11	.05	-.23	-.01	-.44

Table 6

Coefficients of the regression analysis between beliefs related parental role idealization on maternal and paternal depressive symptoms

Label	b	*p*	95%CI		β
			CI. Low	CI.Upp	
Outcome maternal depressive symptoms					
Beliefs related to maternal role idealization (b1m)	.05	.14	-.01	.11	.14
Beliefs related to paternal role idealization (b2m)	-.00	.96	-.05	.05	-.01
Squared beliefs related to maternal role idealization (b3m)	-.02	.38	-.07	.03	-.10
Interaction of the beliefs related to parental role idealization (b4m)	.01	.46	-.02	.05	.07
Squared beliefs related to maternal role idealization (b5m)	.00	.84	-.03	.03	.02
Outcome paternal Depressive Symptoms					
Beliefs related to maternal role idealization (b1f)	.05	.23	-.03	.13	.13
Beliefs related to paternal role idealization (b2f)	.02	.70	-.06	.09	.04
Squared beliefs related to maternal role idealization (b3f)	-.02	.63	-.08	.05	-.05
Interaction of the beliefs related to parental role idealization (b4f)	-.00	.95	-.06	.06	-.01
Squared beliefs related to paternal role idealization (b5f)	-.03	.17	-.08	.02	-.17

Table 7

Coefficients of the Dyadic Response Surface Analysis between beliefs related parental role idealization on maternal and paternal depressive symptoms

Label	Parameter	b	*p*	95%CI		β
				CI. Low	CI.Upp	
Outcome maternal depressive symptoms						
Line of congruence	a1m	.04	.14	-.01	.11	.14
Curvilinearity in line of congruence	a2m	.01	.59	-.03	.07	.04
Line of incongruence	a3m	.05	.34	-.05	.14	.15
Curvilinearity in line of incongruence	a4m	-.02	.72	-.10	.07	-.09
Outcome paternal depressive symptoms						
Line of congruence	a1f	.06	.07	.00	.14	.17
Curvilinearity in line of congruence	a2f	.02	.50	-.03	.08	.06
Line of incongruence	a3f	.03	.63	-.11	.17	.09
Curvilinearity in line of incongruence	a4f	.02	.75	-.08	.20	.07

Table 8

Coefficients of the checklist to test the congruence and reverse congruence hypothesis

Label	est	se	z	*p*	95%CI		Satisfaction of the condition
					CI. Low	CI.Upp	
Congruence between parental beliefs related to others' judgments on maternal depressive symptoms							
p10	2.50	1.25	2.00	.05	.05	4.96	x
p11	-	-	-	-	-	-	-
a4	-	-	-	-	-	-	-
a3	-	-	-	-	-	-	-
Congruence between parental beliefs related to others' judgments on paternal depressive symptoms							
p10	8.36	25.10	.33	.74	-40.83	57.56	✓
p11	.09	.88	.97	.33	-.87	2.58	✓
a4	-.03	.08	-.34	.73	-.18	.13	x
a3	-	-	-	-	-	-	-
Reverse congruence between parental beliefs related to others' judgments on maternal depressive symptoms							
p20	-.20	2.11	-.09	.93	-4.33	3.94	✓
p21	4.06	3.33	1.22	.22	-2.47	10.58	✓
a4	.06	.06	.87	.39	-.07	.18	x
a3	-	-	-	-	-	-	-
Reverse congruence between parental beliefs related to others' judgments on paternal depressive symptoms							
p20	-1.69	2.90	-.59	.56	-7.36	3.99	✓
p21	-1.17	1.20	-.97	.33	-3.53	1.19	✓
a4	-.03	.08	-.34	.73	-.18	.13	x
a3	-	-	-	-	-	-	-
Congruence between parental beliefs related to parental responsibility on maternal depressive symptoms							
p10	-2.12	1.80	-1.18	.24	-5.65	1.40	✓
p11	1.58	.72	2.20	.03	.18	2.99	✓
a4	-.07	.05	-1.62	.11	-.16	.02	x
a3	-	-	-	-	-	-	-
Congruence between parental beliefs related to parental responsibility on paternal depressive symptoms							
p10	.56	.49	1.13	.26	-.41	1.53	✓
p11	.77	.52	1.47	.14	-.26	1.80	✓
a4	-.11	.05	-2.28	.02	-.21	-.02	✓
a3	-.06	.05	-1.06	.29	-.16	.05	✓
Reverse congruence between parental beliefs related to parental responsibility on maternal depressive symptoms							
p20	-1.65	1.52	-1.08	.28	-4.64	1.33	✓
p21	-.63	.29	-2.20	.03	-1.19	-.07	x
a4	-	-	-	-	-	-	-
a3	-	-	-	-	-	-	-
Reverse congruence between parental beliefs related to parental responsibility on paternal depressive symptoms							
p20	-6.26	11.8	-.53	.60	-29.49	16.96	✓
p21	-1.30	.88	-1.47	.14	-3.02	.43	x
a4	-	-	-	-	-	-	-
a3	-	-	-	-	-	-	-
Congruence between beliefs related parental role idealization on maternal depressive symptoms							
p10	-.23	.68	-.34	.73	-1.56	1.10	✓
p11	.18	.28	.64	.52	-.37	.73	x
a4	-	-	-	-	-	-	-
a3	-	-	-	-	-	-	-
Congruence between beliefs related parental role idealization on paternal depressive symptoms							
p10	4.05	58.96	.07	.95	-111.51	119.61	✓
p11	-.04	.61	-.06	.95	-1.23	1.16	✓
a4	.02	.06	.37	.71	-.10	.15	x
a3	-	-	-	-	-	-	-
Reverse congruence between beliefs related parental role idealization on maternal depressive symptoms							
p20	-6.29	9.03	-.70	.49	-23.99	11.41	✓
p21	-5.54	8.67	-.64	.52	-22.52	11.45	✓
a4	-.01	.04	-.40	.69	-.09	.06	x
a3	-	-	-	-	-	-	-
Reverse congruence between beliefs related parental role idealization on paternal depressive symptoms							

p20	28.52	492.15	.06	.95	-936.08	993.11	✓
p21	27.17	449.67	.06	.95	-854.18	908.51	✓
a4	.02	.06	.37	.71	-.10	.15	x
a3	-	-	-	-	-	-	-

Note. A response surface must satisfy four conditions to reflect a congruence or "reverse" congruence effect. Condition for the congruence effect (Humberg et al., 2019): (1) $p10 \approx 0$, (2) $p11 \approx 1$, (3) $a4 < 0$, (4) $a3 \approx 0$. Condition for the "reverse" congruence effect (Humberg et al., 2019): (1) $p20 \approx 0$, (2) $p21 \approx 1$, (3) $a4 > 0$, (4) $a3 \approx 0$. If any of the four conditions is violated, the congruence or "reverse" congruence hypothesis must be rejected and the following coefficients are not reported. Not reported coefficients are indicated by an indent in the table. The x indicate that the condition proposed by Humberg et al. (2019) was not satified, while the ✓ indicate a satisfaction of the condition.