Open Access
OBM Integrative and Complementary Medicine

Original Research

Looking Beyond the Mother: Investigating Relationship Characteristics and Postpartum Depression Risk Factors

Jennifer S. Jewell *, Ashley Brooks-Russell, Jenn Leiferman

Colorado School of Public Health, Aurora, CO, US; E-Mails: jennifer.jewell9@gmail.com; ashley.brooks-russell@cuanschutz.edu; jenn.leiferman@cuanschutz.edu

* **Correspondence:** Jennifer S. Jewell; E-Mail: jennifer.jewell9@gmail.com

Academic Editor: Marianna Mazza

Special Issue: Multi-level Approaches to Preventing Perinatal Mood Disorders

OBM Integrative and Complementary Medicine
2023, volume 8, issue 1
doi:10.21926/obm.icm.2301010

Received: November 11, 2022
Accepted: January 13, 2023
Published: January 29, 2023

Abstract

Postpartum depression (PPD) affects a notable number of women. While many of the risk and protective factors for PPD are specific to the mother, there are also factors that are related to the partner. However, the partner is often overlooked when assessing the landscape of PPD and potential treatment programs. This study sought to expand the knowledge on partner perceptions during the perinatal period. This online, cross-sectional survey of fathers who were in relationships with mothers who had given birth within the last five years or were currently pregnant, included the topics of PPD knowledge and experience, confidence and preparedness in dealing with postpartum changes, expected changes in the relationship, stress, relationship satisfaction, and communication quality. Results of the linear regression analyses indicated significant relationships between communication quality and confidence ($p = 0.021$), preparedness ($p = 0.005$), stress ($p < 0.001$), and postpartum relationship changes ($p < 0.001$). Relationship satisfaction was also significantly related to confidence ($p < 0.001$), preparedness ($p < 0.001$), stress ($p < 0.001$), and postpartum relationship changes ($p < 0.001$). These findings indicate that relationship characteristics may be a vital component in factors related to PPD. The increasing significance and strength of communication quality as a predictor of variables such as confidence in helping the mother cope with mental health

struggles indicates that with increased communication skills and quality, couples can reduce their joint risk factors for PPD. Similar evidence was found for relationship satisfaction. This study supports the theory that partners are a vital component in the family system, and they have to ability to positively influence postpartum maternal mental health outcomes.

Keywords
Postpartum depression; partners; fathers; communication; relationship quality

1. Introduction

Diagnosis of mental illnesses, such as postpartum depression (PPD), affect 10-15% of mothers [1, 2]. The situation has become serious enough for the US Preventive Services Task Force to issue a recommendation statement describing the most common risk factors and most effective prevention and intervention strategies [3]. While many risk factors for PPD are intrinsic to the mother, fathers may also play an important role in her likelihood of being diagnosed with PPD and getting appropriate help [4]. For example, the interaction between parents' mental health statuses may accentuate PPD symptoms in the mother [4]. And the father may influence the mother's likelihood of PPD through their communication quality, relationship satisfaction, and social support [5, 6]. PPD knowledge, coping skills, and mental health attitudes can also influence the father's ability to aid the mother in preventing PPD [7]. Improving these relational factors can play an important role in the improvement of family mental health and the possible prevention of PPD. For clarity, the term father will be used throughout this study to refer to partners of pregnant women, inclusive of same-sex couples.

Previous research has demonstrated that enhancing co-parenting skills through intervention can improve overall family functioning through improved co-parental support, reduced maternal depression and anxiety, and improved infant regulation [8]. Fathers can also serve as crucial encouragement for mothers to seek professional help when needed [9]. Fathers may serve not only as sources of informal help for mothers in perinatal distress, but they may also function as conduits for mothers to procure the formal help that they need. For example, a father may observe behavioral changes that may not be apparent to others. In that situation, the father has the opportunity to not only begin a conversation with the mother to aid in coping and open discussion of the changes, but he also has the ability to take mutually agreed upon steps to help the mother engage in professional help, such as calling doctor's offices for availability, investigating any insurance related questions, or asking friends and family for referrals.

Given the important role that fathers may play in a mother's mental health, it is critical to include them in both prevention and treatment efforts. Unfortunately, to date, few PPD prevention and treatment interventions include fathers in both the intervention and data collection. In several recent meta-analyses of PPD, no studies have noted father participation [10-14]. This is despite evidence that family and couple interventions can positively influence an individual's mental illness [15]. Although those reviews did not include studies with father participation, a review by Pilkinton [16] of 13 interventions found that slightly more than half (7 of 13) included the entire parent couple in the interventions that were included in the review. Many of these studies demonstrated efficacy

in improving mental health, however, only five of the studies collected data on the fathers' mental health.

There is also evidence that fathers desire the knowledge and skills to better help these mothers through difficult times [17]. Fathers have voiced their frustration and lack of knowledge when attempting to decrease the mental burden of pregnancy and postpartum [18]. Yet, researchers have not investigated the relationships among these couple characteristics to determine if they may influence the likelihood of risk factors for PPD. To fill this gap in the research, this study investigates the experience, expectations, and perceptions of fathers during the perinatal period, especially as they relate to PPD.

This study seeks to delineate the potential mechanisms that may be involved in a mother's development of PPD when the couple's relationship and the father himself are taken into account. This study builds upon prior research into the risk and protective factors related to PPD [5, 18-20]. From this research, the authors identified several modifiable intermediary factors related to the mother, the father, and the relationship between the two that may influence the incidence of predictors of PPD in mothers. These factors included communication quality and relationship satisfaction. To further investigate how these modifiable factors related to experiences surrounding PPD, a survey of partners, inclusive of same-sex partners, was conducted. We hypothesized that a maternal diagnosis of PPD (as reported by the father) would be predictive of low feelings of paternal preparedness and high stress. In addition, we hypothesized that fathers' perceptions of their own PPD knowledge would be predictive of coping confidence and stress. Finally, we hypothesized that "parent category" (defined as partners of pregnant women, postpartum partners, and partners who were both postpartum and had a currently pregnant partner) would be predictive of confidence, preparedness, and stress. The results of this study have informed the development of a partner-inclusive PPD prevention program, that seeks to improve several key modifiable factors including paternal knowledge, social support, relationship satisfaction, and communication quality and thereby reduce the incidence of PPD [21].

2. Materials and Methods

2.1 Procedures

This study was an online cross-sectional survey of fathers who were in relationships with mothers who had given birth within the last five years or were currently pregnant. Participants were recruited via social media (e.g., Facebook, Reddit) and email lists (e.g., daddy bootcamp participants). Participants were aged 18 or older and could be male or female; however, no females participated. Thus, the participants consist of fathers. There was deliberate effort to recruit a minimum of 25 participants from each desired category of participants: partners of pregnant women, postpartum partners, and partners who were both postpartum and had a currently pregnant partner. Deliberate efforts included targeted wording in posts (e.g., "Calling all expectant dads!") and posts in online groups with membership specific to the desired participants (e.g., partners of pregnant women). Study data were collected and managed using REDCap (Research Electronic Data Capture) electronic data capture tools hosted by the University [22]. REDCap is a secure, web-based application designed to support data capture for research studies. The survey took approximately 15-20 minutes to complete. There was no compensation for participating. This

study and its materials were approved by the University's institutional review board (COMIRB ID 20-2452).

2.2 Survey

2.2.1 Demographics and Individual Characteristics

The survey contained between 85 and 109 items, depending on participant category. Parents with more experience received more questions about that experience. Questions included the topics of demographics (e.g., race, age, household income, number of children), PPD knowledge and experience, risk to self and partner of various postpartum outcomes (e.g., weight gain, sleep deprivation, arguments, etc.), and expected changes in the relationship. Participants were able to select more than one race. Demographics were used to sort fathers into different "parenting categories," which are described in detail in the section below. PPD knowledge and experience questions included ones such as "How much do you feel like you know about postpartum depression?" (Sliding indicator from 1-100); "Where did you learn what you know about postpartum depression?" (Answer options included books, internet, life experiences, etc.). Questions about risk to self and partner of various postpartum outcomes were included in a matrix with a four-point Likert scale from "Not at all likely" to "Very likely." The main matrix question was "How likely do you think these things are to occur to you or your partner after the baby is born?" The sub-questions included "sleep deprivation," "postpartum anxiety," "increased affection," and nine other items. Expected changes in the relationship were also measured with a matrix. This matrix had a five-point Likert scale ranging from "A lot worse" to "A lot better." The matrix ask how might (or did) different aspects of the relationship change after the birth of a child. Examples of the nine items include "sex life," "communication," and "concerns about money." In addition, overall expectations of change were measure with a single item, "How do you think your relationship will [did] change after the baby is [was] born?" (Five-point Likert scale ranging from "a lot worse" to "a lot better").

Stress was measured with the Perceived Stress Scale (PSS), a 10-item measure of global stress which has a test-retest reliability of >0.70. Scores range from 0-40, with categories defined as low (0-13), medium (14-26), and high (27-40) [23]. Confidence was measured with the question "How confident are you that you will be able to [were able to] help your partner cope with mental health struggles after the baby is [was] born?" (Five-point Likert scale ranging from "not at all confident" to "extremely confident"). Preparedness was measured with the question "How prepared do you think you are [were] for these changes? (i.e., all physical, mental, relational changes that may occur postpartum)" (Five-point Likert scale ranging from "not at all prepared" to "extremely prepared").

2.2.2 Parent Category

Parent category was assessed with a series of branched questions, starting with a question to determine if the mother was currently pregnant or postpartum. Once that was evaluated, additional questions were asked to determine if the couple had previous children. These responses sorted the fathers into three categories: partners of pregnant women, postpartum partners, and partners who were both postpartum and had a currently pregnant partner.

2.2.3 Relationship Characteristics

The Brief Accessibility, Responsiveness, and Engagement (BARE) Scale measures several aspects of couple attachment and communication quality including relationship stability, satisfaction, and positive communication [24, 25]. The test-retest scores ranged from 0.60 to 0.75. Construct validity was established with confirmatory factor analysis. The factor loading for the items were all significant for the constructs they measured. Concurrent validity was established by using the BARE to predict relationship satisfaction and stability [24]. The Dyadic Adjustment Scale – 7 item (DAS-7) measures relationship satisfaction in couples. It has reliability scores ranging from 0.75 to 0.80 [26]. The DAS-7 also correlates well with the Kansas Marital Satisfaction Scale [26].

2.3 Analyses

Linear regression analyses were conducted to test several a priori hypotheses (described below) based on the conceptual model. After the a priori hypotheses were tested, additional exploratory analyses were conducted. Covariates were tested for relationships with the outcome and predictor variables and for consideration in the final models. Unadjusted linear regressions were performed with a designated p-value of less than 0.05 as the indicator of significance. Likert scales were analyzed as interval data [27, 28]. Data analysis was conducted with IBM SPSS Statistics [29].

3. Results

The survey sample contained 91 individuals and was 100% male (Table 1). These fathers were mostly in their 30s (58%). The sample was primarily non-Hispanic (95.6%), White (89%), and well-insured (70% with full private coverage). The sample was well-educated, with 76% having at least a bachelor's degree, and 29.7% made between $100,000 and $149,999 annually. Approximately 32% of the sample were prepartum fathers whose partners were currently pregnant with their first child; 55% of the fathers were labeled postpartum, since their partner had already had at least one child and was not currently pregnant; and 13% were described as dual, because their partner had previously had a child and was also currently pregnant.

Table 1 Sample characteristics.

Variable	n	%
Age		
20-29	18	19.8
30-39	58	63.8
≥40	15	16.5
Gender		
Male	91	100.0
Ethnicity		
Hispanic	4	4.4
Race		
White	81	89.0
Black or African American	6	6.6

American Indian or Alaska Native	1	1.1
Asian	5	5.5
Parent category		
Prepartum	29	31.9
Postpartum	50	54.9
Dual (Participant has previous children and currently pregnant partner)	12	13.2
Insurance		
Full private coverage	70	76.9
Partial private coverage/No coverage	7	7.7
Medicare/Medicaid/VA/Other government health insurance	14	15.4
Income		
<$25,000-$49,999	7	7.7
$50,000-$99,999	23	25.3
$100,000-$149,999	27	29.7
$150,000-$199,999	17	18.7
>$200,000	17	18.7
Education		
High school diploma/GED/Some college	15	16.5
Bachelor's degree	42	46.2
Graduate degree	34	37.4
Marital status		
Married	82	90.1
Divorced	1	1.1
Member of an unmarried couple	8	8.8
Length of time with partner		
1-3 years	11	12.1
4-6 years	22	24.2
7-9 years	25	27.5
≥10 years	33	36.3
Depression (self-report)		
Father ever diagnosed	24	26.4
Mother ever diagnosed	36	39.6
Relationship characteristics		
Communication quality (BARE Scale)		
1st quartile (25-40)	24	26.4
2nd quartile (41-45)	27	29.7
3rd quartile (46-48)	25	27.5
4th quartile (49-55)	15	16.5
Relationship satisfaction (DAS-7)		
Distressed (0-20)	18	20.0
Not distressed (21-34)	72	80.0
Postpartum Experiences		
Perceived Stress Scale		

Low	29	32.2
Moderate	53	58.9
High	8	8.9
Preparedness for postpartum changes		
Not prepared at all	9	10.0
A little prepared	22	24.4
Moderately prepared	44	48.9
Very prepared	13	14.4
Extremely prepared	2	2.2
Confidence in being able to help partner cope with postpartum mental health struggles		
Not confident at all	11	12.2
A little confident	19	21.1
Moderate confident	36	40.0
Very confident	21	23.3
Extremely confident	3	3.3
Postpartum relationship change		
A lot worse	8	8.9
A little worse	18	20.0
Stay the same	26	28.9
A little better	31	34.4
A lot better	7	7.8

Moderate stress levels (with scores between 14-26) were experienced by 58.9% of the sample based on the PSS, with 8.9% reporting high stress (Table 1). Communication quality as measured by the BARE scale was almost evenly distributed across quartiles. Eighty percent of the sample was categorized as non-distressed on the DAS-7. Indicators for preparedness for postpartum changes and confidence in being able to help their partner with mental health struggles were both normally distributed. Views of postpartum relationship change skewed slightly positive.

A test of Hypothesis 1 found that whether the mother had experienced PPD was not associated with feelings of preparedness or stress during the postpartum period (not shown). A test of Hypothesis 2 found that partner PPD knowledge was not related to confidence of coping or postpartum stress (not shown). Finally, in Hypothesis 3, there was not a significant difference on any of the variables of interest between these fathers based on their parent category. Additional analyses revealed that this parent category variable did not have significant relationships with any of the outcome variables of interest.

Exploratory analyses began with Pearson's correlations which were conducted for the variables of interest and the possible co-variates (Table 2). Co-variates showed mixed relationships with the outcome and predictor variables. Age was the only co-variate that demonstrated several significant correlations with the variables of interest.

Linear regressions were conducted with communication quality and relationship satisfaction as predictors of confidence, preparedness, stress, and postpartum relationship change (Table 3). Age was included in multivariate versions of the models, however the stratified age variable showed inconsistent significance, and it did not contribute notably to the R^2 of the models. It was determined that simple linear regressions would be reported.

Table 2 Correlations between potential co-variates and variable of interest.

	Parent category	Age	Ethnicity	White	Black or African American	American Indian or Alaska Native	Asian	Insurance	Income	Education	Marital status	PSS total score	BARE score	DAS-7 score	Confidence	Preparedness
Age	0.201															
Ethnicity	0.062	0.209*														
Race: White	0.062	-0.158	0.075													
Race: Black or African American	-0.060	0.027	-0.057	-0.756**												
Race: American Indian or Alaska Native	-0.133	-0.035	-0.023	0.037	-0.028											
Race: Asian	-0.080	0.172	-0.052	-0.532**	-0.064	-0.025										
Insurance	-0.029	-0.339**	-0.113	0.110	-0.139	-0.055	0.078									
Income	0.130	0.450**	0.062	-0.016	-0.031	-0.097	0.011	-0.363**								
Education	-0.091	0.346**	0.028	-0.060	0.053	-0.188	0.021	-0.341**	0.451**							
Marital status	-0.025	-0.026	-0.070	0.053	-0.009	-0.034	0.090	0.277**	-0.177	-0.060						
PSS total score	0.153	0.018	0.096	0.070	0.042	0.024	-0.122	-0.124	-0.090	0.004	0.035					
BARE score	-0.150	-0.229*	-0.012	0.098	0.052	0.046	-0.188	0.111	-0.088	-0.335**	0.049	-0.373**				
DAS-7 score	-0.205	-0.327**	-0.041	0.001	0.120	0.056	-0.149	0.135	-0.186	-0.205	-0.135	-0.381**	0.672**			
Confidence	-0.044	-0.253*	0.033	0.154	-0.047	0.120	-0.248*	0.104	-0.189	-0.033	-0.082	-0.248*	0.354**	0.441**		

Preparedness	-0.007	-0.164	0.061	-0.061	0.224*	-0.088	-0.254*	-0.020	-0.112	-0.049	-0.035	-0.382**	0.384**	0.451**	0.404**	
Postpartum relationship change	-0.140	-0.266*	-0.172	0.007	0.011	0.085	-0.071	0.220*	-0.243*	-0.284**	-0.143	-0.377**	0.484**	0.549**	0.365**	0.381**

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 3 Strength of communication quality and relationship satisfaction in predicting confidence, preparedness, stress, and postpartum relationship change.

Variable	Confidence[3]		Preparedness[4]		Stress[5]		Postpartum relationship change[6]	
Communication quality[1]	Model Fit R^2 = 0.106 *p* = 0.021		Model Fit R^2 = 0.138 *p* = 0.005		Model Fit R^2 = 0.190 *p* < 0.001		Model Fit R^2 = 0.209 *p* < 0.001	
	Unstandardized B	p-value	Unstandardized B	p-value	Unstandardized B	p-value	Unstandardized B	p-value
1st Quartile (25-40)	-	-	-	-	-	-	-	-
2nd Quartile (41-45)	0.074	0.793	0.244	0.318	-0.384	0.834	0.737	0.010
3rd Quartile (46-48)	0.458	0.108	0.707	0.005	-5.005	0.009	0.863	0.003
4th Quartile (49-55)	0.925	0.006	0.867	0.003	-8.054	<0.001	1.517	<0.001
Relationship satisfaction[2]	Model Fit R^2 = 0.194 *p* < 0.001		Model Fit R^2 = 0.203 *p* < 0.001		Model Fit R^2 = 0.145 *p* < 0.001		Model Fit R^2 = 0.301 *p* < 0.001	
	Unstandardized B	p-value	Unstandardized B	p-value	Unstandardized B	p-value	Unstandardized B	p-value
	0.097	<0.001	0.089	<0.001	-0.596	<0.001	0.131	<0.001

[1] Brief Accessibility, Responsiveness, and Engagement Scale (BARE)

[2] Dyadic Adjustment Scale – 7 item

[3] How confident are you that you will be able to [were able to] help your partner cope with mental health struggles after the baby is [was] born?

[4] How prepared to you think you are [were] for these changes? (i.e., all physical, mental, relational changes that may occur postpartum)

[5] Perceived Stress Scale

[6] How do you think your relationship will [did] change after the baby is [was] born? A lot worse – a lot better

Both communication quality and relationship satisfaction had significant relationships with several of the outcome variables of interest (Table 3). Communication quality, as measured by the BARE scale, was a significant predictor of confidence ($p = 0.021$), preparedness ($p = 0.005$), stress ($p < 0.001$), and postpartum relationship changes ($p < 0.001$), and between 10% and 20% of the variance was explained in these unadjusted models. For all four models the 4th quartile was significantly different from 1st quartile. And for postpartum relationship changes, all quartiles were significantly different from the 1st quartile. Relationship satisfaction was also significantly related to confidence ($p < 0.001$), preparedness ($p < 0.001$), stress ($p < 0.001$), and postpartum relationship changes ($p < 0.001$), and between 15% and 30% of the variance was explained in these unadjusted models (Table 3).

4. Discussion

While the mother is the focus patient in research and practice working to prevent or treat PPD, the role of the father during this pivotal time in the family's life should not be overlooked. By describing the experiences, expectations, and perceptions of fathers during the perinatal period, this study aimed to examine how relationship variables, such as communication quality, relationship satisfaction, and parent category, related to readiness to deal with potential postpartum difficulties.

While no evidence was found in this study to support the a priori hypotheses, the authors propose some potentially modifiable factors with implications for PPD prevention programs. Significant relationships exist between relationship characteristics (relationship satisfaction and communication quality) and possible predictors of PPD (confidence, preparedness, stress, and postpartum relationship change).

Although the sample was homogenous, the findings of this study confirm that relationship characteristics are a vital component in the prevention of PPD predictors, and potentially other negative mental health outcomes for the mother, child, and family. Previous intervention and prevention studies have not included the partner [10-14]. This exclusion of a vital part of the family system when working to prevent a disorder that affects the entire family represents a gap in our current efforts that should be remedied.

The increasing significance and strength of communication quality as a predictor of variables such as confidence in helping the mother cope with mental health struggles may indicate that with increased communication skills and quality, couples can reduce their joint risk factors for PPD. These data support the concept that improvement in couple relationship factors may lead to reduced incidence of PPD and potentially improve overall family function. Similar evidence was found for relationship satisfaction; that characteristic displayed consistent significance with predictors of PPD.

The prior evidence in combination with this study's findings support the idea that a dyadic approach to PPD prevention is both conceptually plausible and likely to succeed [4, 7, 15]. The data from this and prior studies will be incorporated into the framework for a pilot study of a dyadic PPD prevention program. The key relationship elements of communication quality and relationship satisfaction will be central factors that the pilot study will seek to improve.

This study included several limitations including inadequate demographic diversity of the sample. While the sample was stratified based on parenting category, other factors that may influence the results of this study were too homogenous to be included in multivariate analyses. The recruitment strategies and survey administration method may have also reduced the heterogeneity of the

sample. The strengths of this study include its targeted recruitment of a sample of partners who were in various stages of parenting, including first time parents. Partners/fathers are a difficult population to reach, and this study successfully recruited more than the targeted number of partners for each strata of the sample. The study personnel formulated well-researched a priori hypotheses prior to the development of the survey, and although those hypotheses were not supported, sufficient additional data was collected to formulate meaningful findings that can be applied to further research and practice.

5. Conclusions

Practitioners working in couple and group settings can incorporate this evidence into their usual treatment modalities. Whether there are additional risk factors for PPD, such as previous history of maternal depression or not, practitioners can focus on improved communication skills and relationship building to reduce the risk of negative mental health outcomes in the perinatal period. This time of transition in a couple's relationship can include many joys and struggles, and practitioners who seek to improve the overall relationship and communication quality in the time prior to the addition of a child to the family may have a significant impact on the overall family wellbeing. While it may already be readily apparent to many practitioners that these relationship factors can always benefit from improvement, the findings of this study supply specific evidence to support long-term improvement of one of the most common negative mental health outcomes that postpartum women experience [1, 2].

Author Contributions

Dr. Jewell designed the study and developed and implemented the survey. She conducted the analyses and drafted the manuscript. Dr. Brooks-Russell reviewed and refined the survey, advised on analyses, and contributed to writing and editing of the manuscript. Dr. Leiferman advised on the study design, survey design, and analysis plan. She contributed to the writing and editing of the manuscript.

Competing Interests

The authors have declared that no competing interests exist.

References

1. Cameron EE, Sedov ID, Tomfohr-Madsen LM. Prevalence of paternal depression in pregnancy and the postpartum: An updated meta-analysis. J Affect Disord. 2016; 206: 189-203.
2. Ko JY, Rockhill KM, Tong VT, Morrow B, Farr SL. Trends in postpartum depressive symptoms—27 states, 2004, 2008, and 2012. Morb Mortal Wkly Rep. 2017; 66: 153-158.
3. Curry SJ, Krist AH, Owens DK, Barry MJ, Caughey AB, Davidson KW, et al. Interventions to prevent perinatal depression: US Preventive Services Task Force recommendation statement. JAMA. 2019; 321: 580-587.
4. Goodman JH. Paternal postpartum depression, its relationship to maternal postpartum depression, and implications for family health. J Adv Nurs. 2004; 45: 26-35.

5. Lancaster CA, Gold KJ, Flynn HA, Yoo H, Marcus SM, Davis MM. Risk factors for depressive symptoms during pregnancy: A systematic review. Am J Obstet Gynecol. 2010; 202: 5-14.
6. Battle CL, Londono Tobon A, Howard M, Miller IW. Father's perspectives on family relationships and mental health treatment participation in the context of maternal postpartum depression. Front Psychol. 2021; 12: 705655.
7. Henshaw EJ, Durkin KM, Snell RJ. First-time parents' shared representation of postpartum depressive symptoms: A qualitative analysis. Soc Sci Med. 2016; 160: 102-110.
8. Feinberg ME, Kan ML. Establishing family foundations: Intervention effects on coparenting, parent/infant well-being, and parent-child relations. J Fam Psychol. 2008; 22: 253-263.
9. Fonseca A, Canavarro MC. Women's intentions of informal and formal help-seeking for mental health problems during the perinatal period: The role of perceived encouragement from the partner. Midwifery. 2017; 50: 78-85.
10. Sockol LE, Epperson CN, Barber JP. Preventing postpartum depression: A meta-analytic review. Clin Psychol Rev. 2013; 33: 1205-1217.
11. Poyatos-León R, García-Hermoso A, Sanabria-Martínez G, Álvarez-Bueno C, Cavero-Redondo I, Martínez-Vizcaíno V. Effects of exercise-based interventions on postpartum depression: A meta-analysis of randomized controlled trials. Birth. 2017; 44: 200-208.
12. McCurdy AP, Boulé NG, Sivak A, Davenport MH. Effects of exercise on mild-to-moderate depressive symptoms in the postpartum period: A meta-analysis. Obstet Gynecol. 2017; 129: 1087-1097.
13. Werner E, Miller M, Osborne LM, Kuzava S, Monk C. Preventing postpartum depression: Review and recommendations. Arch Womens Ment Health. 2015; 18: 41-60.
14. O'Connor E, Rossom RC, Henninger M, Groom HC, Burda BU. Primary care screening for and treatment of depression in pregnant and postpartum women: Evidence report and systematic review for the US Preventive Services Task Force. JAMA. 2016; 315: 388-406.
15. Baucom DH, Shoham V, Mueser KT, Daiuto AD, Stickle TR. Empirically supported couple and family interventions for marital distress and adult mental health problems. J Consult Clin Psychol. 1998; 66: 53-88.
16. Pilkington PD, Whelan TA, Milne LC. A review of partner-inclusive interventions for preventing postnatal depression and anxiety. Clin Psychol. 2015; 19: 63-75.
17. Letourneau N, Tryphonopoulos PD, Duffett-Leger L, Stewart M, Benzies K, Dennis CL, et al. Support intervention needs and preferences of fathers affected by postpartum depression. J Perinat Neonatal Nurs. 2012; 26: 69-80.
18. Ierardi JA, Fantasia HC, Mawn B, Watson Driscoll J. The experience of men whose partners have postpartum depression. J Am Psychiatr Nurses Assoc. 2019; 25: 434-444.
19. Beck CT. Predictors of postpartum depression: An update. Nurs Res. 2001; 50: 275-285.
20. Milgrom J, Gemmill AW, Bilszta JL, Hayes B, Barnett B, Brooks J, et al. Antenatal risk factors for postnatal depression: A large prospective study. J Affect Disord. 2008; 108: 147-157.
21. Jewell JS, Brooks-Russell A, Mays G, Dempsey A, Hyer J, Leiferman JA. MODparents: Mothers overcoming depression, a feasibility pilot study for pregnant couples. Ment Health Prev. 2022; 27: 200240.
22. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)--A metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform. 2009; 42: 377-381.

23. Lee EH. Review of the psychometric evidence of the perceived stress scale. Asian Nurs Res. 2012; 6: 121-127.
24. Sandberg JG, Busby DM, Johnson SM, Yoshida K. The brief accessibility, responsiveness, and engagement (BARE) scale: A tool for measuring attachment behavior in couple relationships. Fam Process. 2012; 51: 512-526.
25. Sandberg JG, Novak JR, Davis SY, Busby DM. The brief accessibility, responsiveness, and engagement scale: A tool for measuring attachment behaviors in clinical couples. J Marital Fam Ther. 2016; 42: 106-122.
26. Hunsley J, Best M, Lefebvre M, Vito D. The seven-item short form of the Dyadic Adjustment Scale: Further evidence for construct validity. Am J Fam Ther. 2001; 29: 325-335.
27. Carifio J, Perla R. Resolving the 50-year debate around using and misusing Likert scales. Med Educ. 2008; 42: 1150-1152.
28. Sullivan GM, Artino Jr AR. Analyzing and interpreting data from Likert-type scales. J Grad Med Educ. 2013; 5: 541-542.
29. IBM Corp. IBM SPSS statistics for windows, version 27.0. Armonk, NY: IBM Corp.; 2020.