Trajectories of Postpartum Depression in Italian First-Time Fathers

Sara Molgora, PhD[1], Valentina Fenaroli, PhD[1],
Matteo Malgaroli, MS MPhil[2], and Emanuela Saita, PhD[1]

Abstract

Paternal postpartum depression (PPD) has received little attention compared with maternal prenatal and postpartum depression, despite research reporting that paternal PPD concerns a substantial number of fathers. History of depression and antenatal depression have been identified as important PPD's risk factors, underlining the continuity of depressive symptoms during the transition to parenthood. However, only few studies have focused on the evolution of depressive symptoms with longitudinal research design. The present study aims at analyzing the longitudinal trajectories of depressive symptoms from the third trimester of pregnancy to 1 year after childbirth. One hundred and twenty-six first-time fathers completed the Edinburgh Postnatal Depression Scale at four time points (7-8 months of pregnancy, 40 days, 5-6 months, and 12 months after childbirth). Data were analyzed throughout latent growth mixture modeling. Latent growth mixture modeling analysis indicated a three-class model as the optimal solution. The three-class solution included a trajectory of low, stable depressive symptoms across the four time points (*resilient*, 52%); a trajectory of moderate, relatively stable depressive symptomatology (*distress*, 37%); and a trajectory of emergent clinical depression following a pattern of high depressive symptoms (*emergent depression*, 11%). This study allowed to identify different subpopulation within the sample, distinguishing among mental well-being, emotional distress, and high-risk conditions when—1 year after childbirth—fathers report the highest scores to the Edinburgh Postnatal Depression Scale. These results underline the importance to analyze fathers' well-being over the time during the transition to fatherhood.

Introduction

Although there is an increasing amount of research on mental disorders among fathers (Edward, Castle, Mills, Davis, & Casey, 2015), paternal postpartum depression (PPD) is still scarcely considered as a diagnostic entity (Escriba-Agüir & Artazcoz, 2011; Goodman, 2004; Musser, Ahmed, Foli, & Coddington, 2013). It has received little attention compared with maternal prenatal and postpartum depression (Habib, 2012). Previous studies have reported that paternal PPD concerns a relevant number of fathers (Da Costa et al., 2015): The meta-analysis of Paulson and Bazemore (2010) states 10.4%, with the highest rate occurring about 3 to 6 months postpartum.

Scientific literature recognized the negative effects that paternal PPD could have on the relationship with the partner, as well as on the relationship with the child and on the child development (Musser et al., 2013). Many studies have indicated that depressed fathers are more likely to express negative emotions, and to disengage from the couple relationship; these behaviors are connected with lower overall levels of relationship happiness both in themselves and in the partners and an increased risk of disharmony (i.e., higher level of dissatisfaction and lower level of affection) in the couple, also after controlling for maternal mood (Ramchandani et al., 2011). Poor marital quality (e.g., low level of marital satisfaction, high level of marital conflict, etc.) following father's

[1]Catholic University of Milan, Milan, Italy
[2]Columbia University, New York, NY, USA

Corresponding Author:
Sara Molgora, Catholic University of Milan, Largo Gemelli 1, Milan 20123, Italy.
Email: sara.molgora@unicatt.it

depression has been associated with a decrease in mothers' well-being (i.e., presence of depressive symptoms, lack of self-esteem, poor physical health, low level of global happiness and life satisfaction) over time (Proulx, Helms, & Buehler, 2007).

Several studies have reported that children of depressed fathers are at risk for emotional and behavioral problems (Edward et al., 2015; Schumacher, Zubaran, & White, 2008); these problems remain significant after controlling for sociodemographic factors (i.e., social class, degree of education, etc.; Ramchandani, Stein, Evans, O'Connor, & ALSPAC Study Team, 2005). The increased risk of adverse outcomes for children seems to be related to the depressed fathers' specific interactive behaviors. Specifically, depressed fathers report decreased positive and increased negative parenting behaviors: For example, they are more likely to spank and less likely to use positive enrichment activities with their children (e.g., read aloud, sing songs, tell stories, etc.; Davis, Davis, Freed, & Clark, 2011; Sethna, Murray, Netsi, Psychogiou, & Ramchandani, 2015; Wilson & Durbin, 2010). Moreover, the depressed father and child relationship seems to be more conflictual and characterized by impaired communication (Kane & Garber, 2004), and it is independent from the mother's mental well-being (Goodman, 2004; Habib, 2012; Ramchandani et al., 2008; Ramchandani et al., 2011). These results make paternal PPD a relevant phenomenon for both researchers (i.e., to better understand the relationship between these risk factors) and clinicians (i.e., to design parenthood support intervention involving depressed fathers and the entire family unit).

Some studies have focused on paternal PPD's risk factors (Edward et al., 2015; Goodman, 2004; Paulson & Bazemore, 2010; Tuszyńska-Bogucka & Nawra, 2014) reporting that paternal PPD can be predicted by a personal history of depression (prior to partner pregnancy) as well as an antenatal depression (also called prenatal depression), indicating a clinical depression that arose during the partner's pregnancy (Gao, Chan, & Mao, 2009; Ramchandani et al., 2008). These results underline the continuity of depressive symptoms, even during the perinatal period (from pregnancy to postpartum; Cox, Holden, & Henshaw, 2014).

Despite these findings, most studies have analyzed depressive symptom in fathers throughout cross-sectional design (either pregnancy or postpartum), while only few focused on the evolution of depression throughout longitudinal design, identifying the trend of this pathology during the transition to parenthood (Buist, Morse, & Durkin, 2006; Escriba-Agüir & Artazcoz, 2011; Gawlik et al., 2014; Figueiredo & Conde, 2011). It is worth noting that repeated measure studies often examine a brief period of time, covering only the first few months postpartum, so that the course of depression during a longer time is unknown (Escriba-Agüir & Artazcoz, 2011). Furthermore, these studies consider all the subjects together without tracing the presence of different trajectories or identifying multiple subpopulations within the sample, each one with specific development of depressive symptoms over time (Bonanno, 2004).

The present study aims at analyzing the longitudinal trajectories of depressive symptoms from the third trimester of pregnancy to 1 year after childbirth. This longitudinal framework allows to understand the effect that becoming a father has on emotional health considered as an event within a process, rather than simply a turning point (Chin, Hall, & Daiches, 2010; Johansson, Rubertsson, Radestad, & Hildingsson, 2012). From the men's perspective, the birth of a child—especially the firstborn—is characterized by contradictory emotions (Johansson, Fenwick, & Premberg, 2015). Fathers can consider the experience as positive and desire to be actively involved in the transitioning process (pregnancy, labor, delivery, postpartum); however, they can also express feelings of anxiety and vulnerability associated with uncertainly toward the parental role, as well as the worry of not being of help to the partner (Brandão & Figueiredo, 2012; Redshaw & Henderson, 2013). These feelings make the process extremely demanding and create a sensation of unreadiness for fatherhood leading to various forms of distress over time (Giallo et al., 2012). Therefore, our goal is to identify the different longitudinal patterns of depressive symptoms over time, distinguishing a clinical pattern suggestive of PPD from a more generalized state of distress characterized by more normative (below the threshold) values during the perinatal period (Condon, Boyce, & Corkindale, 2004).

Method

Participants and Procedure

Participants comprised 126 Italian first-time fathers, who were recruited from hospitals and family counseling units in Northern Italy (Lombardy) while attending antenatal classes with their partners who were also first-time parents-to-be. The mean age was 34.8 years (SD = 4.07; range = 22-47), and the sample had an education level of high school diploma or above. Other sociodemographic characteristics of the sample are presented in Table 1. Participants were met between May 2012 and September 2014 at four time points: 7 to 8 months of pregnancy (Time 1), 40 days (Time 2), 5 to 6 months (Time 3), and 12 months (Time 4) after childbirth. Only fathers whose partners had a normal pregnancy and childbirth (without medical–obstetric complications) and did not have a past or current diagnosis of any psychiatric disease (including depression) were included in the final sample.

Table 1. Sociodemographic Characteristics of the Sample.

	%
Education	
Middle school diploma	21.9
High school degree	50.0
College degree or graduate	28.1
Occupation	
White-collar job	38.6
Blue-collar job	20.2
Self-employed	23.7
Other (professor, doctor, manager)	17.5

Table 2. Edinburgh Postnatal Depression Scale Mean Total Score, SD, Range, and Cronbach Alpha at Four Time Points.

Time	Mean total score	SD	Range	Alpha
Time 1	4.53	3.58	0-16	.75
Time 2	3.55	3.26	0-14	.79
Time 3	3.06	2.75	0-10	.70
Time 4	4.03	3.73	0-15	.81

Measures

Depressive symptomatology was measured at all-time points using the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987). The scale was developed as a screening tool for postnatal depression, and successively it was validated on a sample of pregnant women (Kozinszky & Dudas, 2015), as well as on first-time fathers (Matthey, Barnett, Kavanagh, & Howie, 2001). It is composed by 10 self-report items with a 0 to 30 total score range. The new validated Italian version for fathers of the EPDS was administered (Loscalzo, Giannini, Contena, Gori, & Benvenuti, 2015) using 12.5 as cutoff score for clinical depression, with 90% sensitivity and 90% specificity. Means, standard deviations, and coefficient alphas of the EPDS are presented in Table 2 and bivariate correlations about scores of the EPDS for each time point are shown in Table 3.

Furthermore, participants were asked about demographic information, anamnestic data, and the course of pregnancy at Time 1. They also filled a self-report form regarding childbirth at Time 2.

Analysis

Latent growth mixture modeling (LGMM; B. Muthén & Muthén, 2000) was performed to identify the best fitting model of depressive symptoms growth trajectories over the four time points. LGMM does not rely on the assumption that individuals belong to a homogeneous distribution that can be meaningfully described by a single mean response (Duncan & Duncan, 2004). Instead, it allows to identify subpopulations (or classes) that are characterized by heterogeneous growth patterns (B. Muthén, 2004). These methods have been previously applied to study well-being responses to first-time parenthood (Galatzer-Levy, Mazursky, Mancini, & Bonanno, 2011), as well as to analyze psychopathology trajectories in response to major life events (Bonanno, Westphal, & Mancini, 2011; Galatzer-Levy & Bonanno, 2012).

A series of nested LGMM models with increasing number of classes were analyzed using M*plus* 7.2 (L. K. Muthén & Muthén, 2010). LGMM growth curve model specification, estimation, and all related technical aspects are described in Technical Appendix 8 of the M*plus* software user's guide (B. Muthén, 2004). The optimal number of classes was determined comparing a combination of indices for improvements of fit (Nylund, Asparouhov, & Muthén, 2007): Akaike information criterion, Bayesian information criterion, sample-size-adjusted Bayesian information criterion, relative entropy, Lo–Mendell–Rubin–adjusted likelihood ratio test, and parametric bootstrapped likelihood ratio test. A solution is deemed having the best relative fit based on lower information criteria values, significant likelihood ratio tests, and higher entropy (Jung & Wickrama, 2008). In addition, explanatory properties, theoretical coherence, and parsimony are also considered to determine the optimal number of classes (B. Muthén, 2003, 2004).

Results

The relative fit for progressive model solutions ranging from one to four classes is reported in Table 4. For the purpose of model convergence, the variances of the intercept and quadratic parameters were fixed, while variance of the slope was allowed to be freely estimated across classes. The four-class solution was the one with the best information criteria, but the Lo–Mendell–Rubin–adjusted likelihood ratio test p value was not significant for this solution, indicating that the one-less-class solution was more appropriate in describing the observed population. The three-class solution had better information criteria when compared with the remaining models, and had a significant likelihood ratio test. Therefore, the three-class model was considered the optimal solution.

The best fitting model, displayed in Figure 1, identifies three subpopulations of fathers that are heterogeneous in their longitudinal growth of depressive symptoms. The best log-likelihood value of the model replicated, indicating it converged successfully. Probability of distinct class membership was high, with values ranging from .91 to .95. The three-class solution included a trajectory of low, stable depressive symptoms

Table 3. Edinburgh Postnatal Depression Scale Correlation Matrix.

Time	Time 1	Time 2	Time 3	Time 4
Time 1		.55**	.50**	.66**
Time 2			.68**	.72**
Time 3				.68**
Time 4				

across the four time points (*resilient*, 52%); a trajectory of moderate, relatively stable depressive symptomatology (*distress*, 37%); and a trajectory of emergent clinical depression following a pattern of higher depressive symptoms (*emergent depression*, 11%). The resilient class was characterized by a low intercept (est. = 2.36, SE = 0.25, $p \leq .001$), flat slope (est. = −0.62, SE = 0.29, $p \leq .05$) and by a nonsignificant quadratic parameter (est. = 0.09, SE = 0.05, p = .10); this class reported low and stable levels of depressive symptoms at all four time points. The distress class was characterized by a moderate intercept (est. = 5.85, SE = 0.44, $p \leq .001$), a significant negative slope (est. = −1.49, SE = 0.55, $p \leq .01$), and a significant quadratic parameter (est. = 0.29, SE = 0.10, $p \leq .01$); this class presented moderate depressive symptoms that marginally decreased from pregnancy to 5 to 6 months postpartum, and then went back to baseline levels after a year postpartum. The emergent depression class was characterized by a high intercept (est. = 10.40, SE = 1.21, $p \leq .001$), a significant negative slope (est. = −2.97, SE = 0.55, $p \leq .001$), and by a significant quadratic parameter (est. = 0.69, SE = 0.07, $p \leq .001$); this class displayed relatively consistent high levels of depressive symptoms, reaching the threshold for clinical depression (Loscalzo et al., 2015) a year after childbirth.

Discussion

The present study aimed at analyzing growth trajectories of depressive symptoms from the third trimester of pregnancy to 1 year after childbirth in a sample of first-time fathers. Throughout a longitudinal research design over four time points, the goal was to distinguish clinical patterns (i.e., trajectories characterized by scores above the clinical cutoff at one or more time points) and nonclinical pattern (i.e., trajectories characterized by scores below the clinical cutoff across all four time points).

Results indicated that there are three different trajectories of depressive symptoms: resilient, distress, and emergent depression. The first class represented the well-being condition described by a pattern of stable low symptom; the majority of the sample was assigned to this class, indicating how psychological resilience to potential stressor (i.e., childbirth) is the most common response

(Bonanno, 2004). The second class represented an emotional distress condition described by a pattern of moderate and rather stable EPDS scores (Massoudi, Hwang, & Wickberg, 2013); this class was composed by more than a third of the sample, strengthening the hypothesis that distress and anxiety could be more frequent than clinical depression in new fathers (Loscalzo et al., 2015; Matthey, Barnett, Howie, & Kavanagh, 2003). The third class represented the high-risk condition characterized by depressive symptoms close to the clinical cutoff during pregnancy, 40 days, and 5 to 6 months after childbirth; the symptoms reached the threshold values at 1 year after childbirth identifying this group as the emergent depression condition. This class included 11% of the subjects, fitting the percentages for paternal PPD stated in other studies (Paulson & Bazemore, 2010).

In accordance with previous research (Areias, Kumar, Barros, & Figueiredo, 1996; Matthey, Barnett, Ungerer, & Waters, 2000), the rate of depression during the prenatal period decreased shortly in the first months after childbirth (40 days and 5-6 months postpartum) and then increased over the course of the first year. Specifically, 1 year after childbirth the majority of fathers reported lower depressive symptoms than during pregnancy (first class), other fathers returned to the starting score (second class), and the smallest group reported higher symptoms reaching the clinical threshold (third class). It is possible to hypothesize that childbirth constituted a positive experiences for all fathers, and that the positive effects lasted for some months (Plantin, Olukoya, & Ny, 2011). Furthermore, for fathers, the most important changes in psychological, relationship, and lifestyle dimensions occurred relatively early in pregnancy, so that pregnancy represented the most stressful period during the transition to parenthood. Conversely, after childbirth, lack of change was the most widespread characteristic indicating that fathers were ill-prepared for the impact of parenthood on their lives (Condon et al., 2004).

Previous findings linked depressive symptoms in men with social variables, such as a lack of social support and poor quality of their couple relationships (Bielawska-Batorowicz & Kossakowska-Petrycka, 2006; Boyce, Condon, Barton, & Corkindale, 2007; Bronte-Tinkew, Moore, Matthews, & Carrano, 2007; Gao et al., 2009; Roberts, Bushnell, Collings, & Purdie, 2006). For those fathers with highest levels in our study of prenatal symptoms, the distress became clinically relevant (above the cutoff) 1 year after birth. It should also be noted that in Italy, 5 to 6 months after pregnancy usually coincides with the end of maternity leave. Therefore, the heightened distress reported by fathers could also be connected with the complexities of managing the combination of increasing work and family commitments. There is evidence in the literature that fathers can experience difficulties handling

Table 4. Fit Indices for One- to Four-Class Unconditional Latent Growth Mixture Models of Depressive Symptoms.

| Statistics	One class	Two classes	Three classes	Four classes
Akaike information criteria	2197.588	2097.339	2058.902	2047.864
Bayesian information criteria	2220.278	2131.374	2104.282	2104.589
Sample-size-adjusted Bayesian information criteria	2194.979	2093.427	2053.685	2041.343
Entropy	—	0.869	0.859	0.831
Lo–Mendell–Rubin–adjusted LRT	—	102.928	44.155	18.102
p	—	<.01	<.05	.1384
Bootstrapped LRT p	—	<.0001	<.0001	<.0001

Note. LRT = likelihood ratio test.
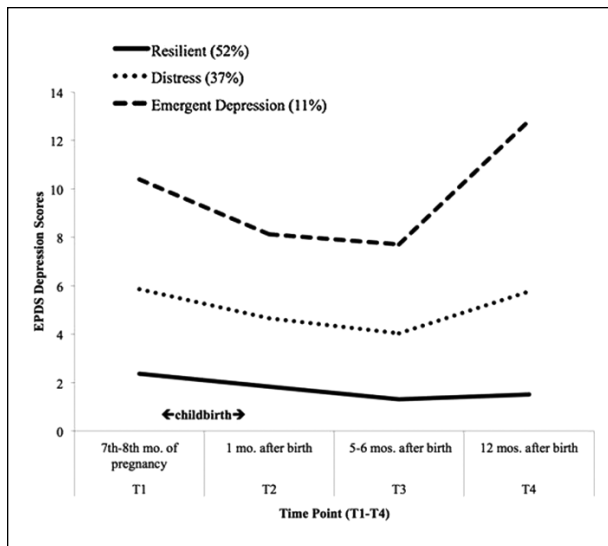
Figure 1. Mean depressive symptoms score as a function of time point and class (N = 126).

the new family structure and in supporting their partners materially and emotionally (Brandão & Figueiredo, 2012; Redshaw & Henderson, 2013). The presence of problems related with sexual intimacy can also be an increasing risk factor for those couples already manifesting these issues during pregnancy (Condon et al., 2004).

The specificity of the transition to fatherhood from that to motherhood should be noted, in particular due to the differences in the longitudinal patterns of psychopathological symptoms. Longitudinal studies that focused on a sample of women (e.g., Luoma, Korhonen, Salmelin, Helminen, & Tamminen, 2015) reported a chronic depression pattern (as opposed to an emergent one) with a high number of symptoms across all time points. The dissimilarity of symptoms trajectories could be further explained by taking into consideration the different depression predictors: Paternal depression is connected to social and relational variables, and therefore, probably more exposed to fluctuations over time; maternal depression is mainly

associated with intrapsychic factors (Robertson, Grace, Wallington, & Stewart, 2004), and possibly more stable. Additionally, the specificity of the motherly and fatherly paternal roles is connected to different demands and expectations (Cooper, 2005). The modern social expectations about men's involvement in the care of the child are challenging: to be at the same time breadwinners, guides, household help, and nurturers (Crespi & Ruspini, 2015). These concurrent demands can have a significant impact in shaping their identity as both men and fathers, as well as on their well-being (Crespi & Ruspini, 2015), potentially developing depressive symptomatology in those men that struggled during pregnancy to cope with the difficulties of becoming first-time fathers.

Last, the presence of the highest EPDS scores at 1 year after childbirth allowed identifying the time after the baby's birth as challenging for fathers, supporting the importance of longitudinal studies beyond the first few months after childbirth, and giving useful information for clinical interventions. Transition to parenthood should be studied across its different stages (in terms of demands, role, and relational changes) to better understand what are the specific challenges that father need to cope with during the newborn's first year, which can lead to a worse quality of life and the reemergence of psychological distress. Furthermore, since EPDS scores during pregnancy were predictors of the EPDS scores after pregnancy, these findings could help health care workers identify at early stages first-time fathers who may benefit from educational programs or clinical intervention in their transition to fatherhood. This could prevent the emergence of psychopathology or mitigate the effects of psychological distress. Some studies have also reported that fathers who had no or insufficient information about pregnancy and childbirth were at risk of being distressed (Boyce et al., 2007). Providing information about their partner's pregnancy, childbirth, and issues relating to caring for a newborn infant could be another form of basic intervention to reduce distress.

The current study has some limitations that should be acknowledged. First, the sample consisted of fathers who

attended antenatal class with their partners. While these courses in Italy require the presence of both partners for at least a few meetings, the participations of these fathers (to the class and to the research) indicates that they were particularly involved during the perinatal period and supportive of their partners. Consequently, the findings may not generalize to fathers who are relatively less involved and/or less supportive as a partner. Second, while the EPDS is a validated self-report instrument used to assess the presence of depressive symptoms, it is not strictly a diagnostic tool for depression (Fenaroli, Saita, Molgora, & Accordini, 2016). A clinical interview could provide more detailed information about the presence of depressive symptoms 1 year after childbirth. Furthermore, it could be important to consider gender differences in the expression of symptoms, since the EPDS—as well as the other instruments used for the assessment of depression during the perinatal period—is based on female's conventional expression of the symptoms (Madsen & Juhl, 2007). Third, depressive symptoms were analyzed using only unconditional LGMM. Future research could include other variables (e.g., sociodemographic, anamnestic, psychological, related to childbirth, etc.) nested as covariates in a more complex model. Last, it could be of interest to analyze partners' scores, as several studies indicate that maternal depression is one of the strongest predictor of paternal depression during the postnatal period (Goodman, 2004). Furthermore, the sample is homogeneous in terms of fathers' social and cultural characteristics, and future research could also include fathers with low socioeconomic status.

Despite these limitations, the study has a number of strengths. First, this is a longitudinal research design over a longer period of time compared with similar studies. Second, data analysis methods that allowed to identify multiple subpopulations and to describe different trajectories of symptoms corresponding to each subpopulation were used. Third, to the authors knowledge the present work is the first longitudinal research study on Italian first-time fathers' postpartum depression, representing a first effort toward a better understanding of this phenomenon in the Mediterranean sociocultural context. For the aforementioned reasons, this study could be a first step in planning specific support interventions for fathers transitioning to parenthood.

Declaration of Conflicting Interests

Funding

References

Areias, M. E., Kumar, R., Barros, H., & Figueiredo, E. (1996). Correlates of postnatal depression in mothers and fathers. *British Journal of Psychiatry*, *169*, 36-41.

Bielawska-Batorowicz, E., & Kossakowska-Petrycka, K. (2006). Depressive mood in men after the birth of their offspring in relation to a partner's depression, social support, fathers' personality and prenatal expectations. *Journal of Reproductive and Infant Psychology*, *24*, 21-29.

Bonanno, G. A. (2004). Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? *American Psychologist*, *59*, 20-28.

Bonanno, G. A., Westphal, M., & Mancini, A. D. (2011). Resilience to loss and potential trauma. *Annual Review of Clinical Psychology*, *7*, 511-535.

Boyce, P., Condon, J., Barton, J., & Corkindale, C. (2007). First-time fathers' study: Psychological distress in expectant fathers during pregnancy. *Australian and New Zealand Journal of Psychiatry*, *41*, 718-725.

Brandão, S., & Figueiredo, B. (2012). Fathers' emotional involvement with the neonate: Impact of the umbilical cord cutting experience. *Journal of Advanced Nursing*, *68*, 2730-2739.

Bronte-Tinkew, J., Moore, K., Matthews, G., & Carrano, J. (2007). Symptoms of major depression in a sample of fathers of infants: Sociodemographic correlates and links to father involvement. *Journal of Family Issues*, *28*, 61-99.

Buist, A., Morse, C. A., & Durkin, S. (2006). Men's adjustment to fatherhood: Implications for obstetric health care. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, *32*, 172-180.

Chin, R., Hall, P., & Daiches, A. (2010). Fathers' experiences of their transition to fatherhood: A metasynthesis. *Journal of Reproductive and Infant Psychology*, *29*, 4-18.

Condon, J. T., Boyce, P., & Corkindale, C. J. (2004). The First-Time Fathers Study: A prospective study of the mental health and wellbeing of men during the transition to parenthood. *Australian and New Zealand Journal of Psychiatry*, *38*, 56-64.

Cooper, S. (2005). A rite of involvement? Men's transition to fatherhood. *Durham Anthropology Journal*, *13*(2), 1-24.

Cox, J. L., Holden, J. M., & Henshaw, C. (2014). *Perinatal mental health: The Edinburg Postnatal Depression Scale (EPDS) manual*. London, England: RCPsych.

Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry*, *150*, 782-786.

Crespi, I., & Ruspini, E. (2015). Transition to fatherhood: New perspectives in the global context of changing men's identities. *International Review of Sociology*, *25*, 353-358.

Da Costa, D., Zelkowitz, P., Dasgupta, K., Sewitch, M., Lowensteyn, I., Cruz, R., . . . Khalifé, S. (2015). Dads get sad too: Depressive symptoms and associated factors in expectant first-time fathers. *American Journal of Men's Health*. Advance online publication. doi:10.1177/1557988315606963

Davis, R. N., Davis, M. M., Freed, G. L., & Clark, S. J. (2011). Father's depression related to positive and negative parenting behaviors with 1-year-old children. *Pediatrics*, *127*, 612-618.

Duncan, T. E., & Duncan, S. C. (2004). An introduction to latent growth curve modeling. *Behavior Therapy*, *35*, 333-363.

Edward, K., Castle, D., Mills, C., Davis, L., & Casey, J. (2015). An integrative review of paternal depression. *American Journal of Men's Health*, *9*, 26-34.

Escriba-Agüir, V., & Artazcoz, L. (2011). Gender differences in postpartum depression: A longitudinal cohort study. *Journal of Epidemiology & Community Health*, *65*, 320-326.

Figueiredo, B., & Conde, A. (2011). Anxiety and depression symptoms in women and men from early pregnancy to 3-months postpartum: Parity differences and effects. *Journal of Affective Disorders*, *132*, 146-157.

Fenaroli, V., Saita, E., Molgora, S., & Accordini, M. (2016). Italian Women's Experience of Childbirth: A Prospective Longitudinal Study of Predictors of Delivery and Subjective Experience. *Journal of Reproductive and Infant Psychology*, *34*(3), 235-246. doi: 10.1080/02646838.2016.1167864

Galatzer-Levy, I. R., & Bonanno, G. A. (2012). Beyond normality in the study of bereavement: Heterogeneity in depression outcomes following loss in older adults. *Social Science & Medicine*, *74*, 1987-1994.

Galatzer-Levy, I. R., Mazursky, H., Mancini, A. D., & Bonanno, G. A. (2011). What we don't expect when expecting: Evidence for heterogeneity in subjective well-being in response to parenthood. *Journal of Family Psychology*, *25*, 384-392.

Gao, L. L., Chan, S. W., & Mao, Q. (2009). Depression, perceived stress and social support among first-time Chinese mothers and fathers in the postpartum period. *Research in Nursing & Health*, *32*, 50-58.

Gawlik, S., Muller, M., Hoffmann, L., Dienes, A., Wallwiener, M., Sohn, C., . . . Reck, C. (2014). Prevalence of paternal perinatal depressiveness and its link to partnership satisfaction and birth concerns. *Archives of Women's Mental Health*, *17*, 49-56.

Giallo, R., D'Esposito, F., Christensen, D., Mensah, F., Cooklin, A., Wade, C., . . . Nicholson, J. (2012). Father mental health during the early parenting period: Results of an Australian population based longitudinal study. *Social Psychiatry and Psychiatric Epidemiology*, *47*, 1907-1916.

Goodman, J. H. (2004). Paternal postpartum depression, its relationship to maternal postpartum depression, and implications for family health. *Journal of Advanced Nursing*, *45*, 26-35.

Habib, C. (2012). Paternal perinatal depression: An overview and suggestions towards an intervention model. *Journal of Family Studies*, *18*, 4-16.

Johansson, M., Fenwick, J., & Premberg, A. (2015). A meta-synthesis of fathers' experiences of their partner's labour and the birth of their baby. *Midwifery*, *31*, 9-18.

Johansson, M., Rubertsson, C., Radestad, I., & Hildingsson, I. (2012). Childbirth: An emotionally demanding experience for fathers. *Sexual & Reproductive Healthcare*, *3*, 11-20.

Jung, T., & Wickrama, K. A. S. (2008). An introduction to latent class growth analysis and growth mixture modeling. *Social and Personality Psychology Compass*, *2*, 302-317.

Kane, P., & Garber, G. (2004). The relations among depression in fathers, children's psychopathology, and father–child conflict: A meta-analysis. *Clinical Psychology Review*, *24*, 339-360.

Kozinszky, Z., & Dudas, R. B. (2015). Validation studies of the Edinburgh Postnatal Depression Scale for the antenatal period. *Journal of Affective Disorders*, *176*, 95-105.

Loscalzo, Y., Giannini, M., Contena, B., Gori, A., & Benvenuti, P. (2015). The Edinburgh Postnatal Depression Scale for fathers: A contribution to the validation for an Italian sample. *General Hospital Psychiatry*, *37*, 251-256.

Luoma, I., Korhonen, M., Salmelin, R. K., Helminen, M., & Tamminen, T. (2015). Long-term trajectories of maternal depressive symptoms and their antenatal predictors. *Journal of Affective Disorders*, *170*, 30-38.

Madsen, S. A., & Juhl, T. (2007). Paternal depression in the postnatal period assessed with traditional and male depression scales. *Journal of Men's Health & Gender*, *4*, 26-31.

Massoudi, P., Hwang, C. P., & Wickberg, B. (2013). How well does the Edinburgh Postnatal Depression Scale identify depression and anxiety in fathers? A validation study in a population based Swedish sample. *Journal of Affective Disorders*, *149*, 67-74.

Matthey, S., Barnett, B., Howie, P., & Kavanagh, D. J. (2003). Diagnosing postpartum depression in mothers and fathers: Whatever happened to anxiety? *Journal of Affective Disorders*, *74*, 39-47.

Matthey, S., Barnett, B., Kavanagh, D. J., & Howie, P. (2001). Validation of the Edinburgh Postnatal Depression Scale for men, and comparison of item endorsement with their partners. *Journal of Affective Disorders*, *64*, 175-184.

Matthey, S., Barnett, B., Ungerer, J., & Waters, B. (2000). Paternal and maternal depressed mood during the transition to parenthood. *Journal of Affective Disorders*, *60*, 75-85.

Musser, A. K., Ahmed, A. H., Foli, K. J., & Coddington, J. A. (2013). Paternal postpartum depression: What health care providers should know. *Journal of Pediatric Health Care*, *27*, 479-485.

Muthén, B. (2003). Statistical and substantive checking in growth mixture modeling: Comment on Bauer and Curran. *Psychological Methods*, *8*, 369-377.

Muthén, B. (2004). Latent variable analysis. In D. Kaplan (Ed.), *The SAGE handbook of quantitative methodology for the social sciences* (pp. 345-368). Thousand Oaks, CA: Sage.

Muthén, B., & Muthén, L. K. (2000). Integrating person-centered and variable-centered analyses: Growth mixture modeling with latent trajectory classes. *Alcoholism: Clinical and Experimental Research*, *24*, 882-891.

Muthén, L. K., & Muthén, B. (2010). *Mplus user's guide: Statistical analysis with latent variables*. Los Angeles, CA: Author.

Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling*, *14*, 535-569.

Paulson, J. F., & Bazemore, S. D. (2010). Prenatal and postpartum depression in fathers and its association with maternal depression: A meta-analysis. *Journal of the American Medical Association, 303,* 1961-1969.

Plantin, L., Olukoya, A. A., & Ny, P. (2011). Positive health outcomes of fathers' involvement in pregnancy and childbirth paternal support: A scope study literature review. *Fathering, 9*(1), 87-102.

Proulx, C. M., Helms, H. M., & Buehler, C. (2007). Marital quality and personal well-being: A meta-analysis. *Journal of Marriage and Family, 69,* 576-593.

Ramchandani, P. G., O'Connor, T. G., Evans, J., Heron, J., Murray, L., & Stein, A. (2008). The effects of pre- and postnatal depression in fathers: A natural experiment comparing the effects of exposure to depression on offspring. *Journal of Child Psychology and Psychiatry, 49,* 1069-1078.

Ramchandani, P. G., Psychogiou, L., Vlachos, H., Iles, J., Sethna, V., Netsi, E., & Lodder, A. (2011). Paternal depression: An examination of its links with father, child and family functioning in the postnatal period. *Depression and Anxiety, 28,* 471-477.

Ramchandani, P., Stein, A., Evans, J., O'Connor, T., & ALSPAC Study Team. (2005). Paternal depression in the postnatal period and child development: A prospective population study. *Lancet, 365,* 2201-2205.

Redshaw, M., & Henderson, J. (2013). Fathers' engagement in pregnancy and childbirth: Evidence from a national survey. *BMC Pregnancy and Childbirth, 13*(1), 70.

Roberts, S., Bushnell, J., Collings, S., & Purdie, G. (2006). Psychological health of men with partners who have postpartum depression. *Australian and New Zealand Journal of Psychiatry, 40,* 704-711.

Robertson, E., Grace, S., Wallington, T., & Stewart, D. E. (2004). Antenatal risk factors for postpartum depression: A synthesis of the recent literature. *General Hospital Psychiatry, 26,* 289-295.

Schumacher, M., Zubaran, C., & White, G. (2008). Bringing birth-related paternal depression to the fore. *Women and Birth, 21*(2), 65-70.

Sethna, V., Murray, L., Netsi, E., Psychogiou, L., & Ramchandani, P. G. (2015). Paternal depression in the postnatal period and early father-infant interactions. *Parenting, Science and Practice, 15,* 1-8.

Tuszyńska-Bogucka, W., & Nawra, K. (2014). Paternal postnatal depression: A review. *Archives of Psychiatry and Psychotherapy, 2,* 61-69.

Wilson, S., & Durbin, C. E. (2010). Effects of paternal depression on fathers' parenting behaviors: A meta-analytic review. *Clinical Psychology Review, 30,* 167-180.