Distress Symptomatology in Men during their Partner's Pregnancy

by

Kim Yiong Wee
Graduate Diploma of Psychology (Deakin University)

Submitted in fulfilment of the requirements for the degree of
Doctor of Philosophy (Psychology)

Deakin University
July, 2015
I am the author of the thesis entitled:

*Distress Symptomatology in Men during their Partner's Pregnancy*

submitted for the degree of:

Doctor of Philosophy (Psychology)

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**Date:** 02/06/2015
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Abstract

Research has shown that men can be at risk of suffering from elevated levels of depressive symptoms during their partner’s pregnancy and in the postpartum. However, the risk factors for elevated levels of depressive symptoms in men during these life phases have not been studied systematically. The overall aim of this thesis was to explore predictors of elevated depressive symptoms in men during their partner’s pregnancy. This was achieved via two systematic reviews and two empirical studies. Given that the reviews were published a few years ago, and that there have been no other similar systematic reviews done, updates to the two reviews were undertaken. As part of the update review, an evaluation of the effectiveness of current intervention programs that were designed specifically for men who were suffering from depression during the perinatal period was also undertaken.

The specific aim of the first systematic review was to review the literature on the correlates and predictors of depressive symptoms in expectant fathers pre- and post-birth. The findings revealed that the most common correlate of paternal depressive symptoms during their partner’s pregnancy and in the postpartum was having a partner with elevated depressive symptoms or depression. This review was published in the Journal of Affective Disorders in May 2011. A recent update of this systematic review revealed 11 new articles; of these, five adopted a cross-sectional design that focused on paternal depression during the postpartum, and six studies were longitudinal in design. The 11 studies revealed very similar risk factors of paternal perinatal depression as those found in the first published review (see Chapter 2); the limitations of these studies were also similar to those found in this published review.
The specific aim of the second review was to review the literature on what we know about paternal depression during the perinatal period and the effectiveness of current intervention programs for men experiencing paternal depression. The findings of this review revealed that: 1) there is a paucity of research evaluating how depression during the perinatal period manifests differently in men than women and if men cope with their depression differently as compared to women; 2) there is a lack of studies comparing the risk factors of paternal depression during the perinatal period and the risk factors for general depression in men; and 3) there is currently a lack of effective interventions for men suffering from depression during the perinatal period. This review was published in the *British Journal of Midwifery* in May 2013.

An update of the second published review paper revealed only one additional published intervention study. This study together with the four intervention studies reported in the published review were evaluated using the grading and recommendations assessment, development and evaluation (GRADE) approach. With only five studies, to date, and the fact that the quality of evidence for the reduction of depressive symptoms, anxiety and stress is very low, it is not possible to draw any conclusive findings or recommendations.

The aim of the first empirical study was to examine the bi-directional relationships between paternal depressive, anxiety and stress symptoms in fathers during the antenatal period. After accounting for the relative stability of depression, anxiety and stress over time, for men higher levels of anxiety earlier in pregnancy predicted higher levels of depression and stress in middle pregnancy, which predicted higher depression during late pregnancy. A similar relationship remained after partialling out the effects of partner’s depression,
perceived social support, and sleep quality. Further analyses also revealed significant differences in the manifestation of distress symptoms between men and women, but not between first-time and non-first-time fathers. This study was submitted to the *Journal of Reproductive and Infant Psychology* and accepted for publication in May 2015.

The aim of the second empirical study was to examine whether men’s distress symptoms at early, mid and late pregnancy predicted their partner’s distress symptoms, whether women’s distress symptoms at early, mid and late pregnancy predicted men’s distress symptoms, and to investigate the moderating effects of social support on the relationship between men’s and their partner’s levels of distress. The results revealed that there were no significant reciprocal influences between men and their partner on distress symptomatology. Social support also did not significantly moderate the relationship between paternal and maternal levels of distress. However, paternal distress symptoms at each time point were found to be predictive of that measure at the following time point. Low levels of perceived social support in men earlier on in their partner’s pregnancy were also predictive of higher levels of paternal distress earlier on in their partner’s pregnancy. This study was submitted to the *Journal of Reproductive and Infant Psychology* in June 2015.

In sum, according to the two published reviews and the current updated systematic reviews, most studies have just explored uni-directional associations between potential correlates and/or risk factors for depression during the ante- and postnatal period in men, with most studies focusing on identifying correlates or risk factors of paternal depression in the postpartum. Studies that were conducted through pregnancy had limited (most only have one collection time point)
assessment points during gestation. The reviews also show that there is a lack of effective intervention programs designed to prevent or treat perinatal distress in fathers. Also, empirical Study 1 and 2 demonstrated that men do experience distress during their partner’s pregnancy. This is consistent with the findings of the systematic reviews. The findings of these two empirical studies also suggest that distress symptoms experienced by men antenatally may be elevated and related to this significant life stage, and that there might be significant differences in the experience and manifestation of distress symptoms between men and women. Again, this is consistent with the findings of the systematic reviews. The results of Study 1 and 2 further demonstrated that depression, anxiety and stress (distress symptoms) in men have a bi-directional relationship with one another across their partner’s pregnancy, and that distress symptoms are predictive of that measure across the antenatal period. The results from Study 1 and 2 also highlighted the need to study the development of distress in men during the perinatal period, and its correlates and risk factors using a multidimensional approach.
Perinatal Depression in Men

The arrival of a new baby is marked by many changes, adaptations and challenges, with pregnancy and the postpartum a time in parents’ lives when the risk of elevated mood symptoms can be high (Tammentie, Tarkka, Åstedt-Kurki, Paavilainen, & Laippala, 2004). Antenatal and postnatal depression, also known as prenatal and postpartum depression, is a depressive condition that occurs during gestation and after having a baby respectively. Antenatal and postnatal depression is also known collectively as perinatal depression. Antenatal and postnatal depression is typified by a constant occurrence of sadness or a moderated ability to experience pleasure, irritability, feelings of low self-esteem and heightened levels anxiety (Gao, Chan, You, & Li, 2010; Milgrom & McCloud, 1996; Murray, Cooper, & Hipwell, 2003). Sufferers often have a predisposition to fret over their own health and well-being and would find it hard to focus on their baby’s experiences (Murray et al., 2003). Suffers are also constantly fatigued, as well as having alterations in sleep patterns and appetite (Milgrom & McCloud, 1996; Murray et al., 2003; Serhan, Ege, Ayrańci, & Kosgeroglu, 2013).

There is a prevalent belief that only women are affected by depression during pregnancy and the postpartum period, and, as a consequence, most research to date has focused on mothers. However, recent research has shown that men are affected by depression during the ante- and postnatal period as well (e.g., Figueiredo & Conde, 2011; Fletcher, Matthey, & Marley, 2006; Giallo et al., 2012; Matthey, Barnett, Howie, & Kavanagh, 2003; Rosenthal, Learned, Liu, &
Weitzman, 2013; Serhan et al., 2013). Men can also experience their partner’s pregnancy and the birth of a new baby as a stressful time period filled with new challenges and adjustment to routines (Condon, 2006). These stressful changes can lead to depression for men in similar ways that it does for some women (Madsen, 2011; Solantaus & Salo, 2005).

The remainder of this chapter provides a historical perspective of the current research by describing very early studies on the psychological well-being of men during the perinatal period, and also reviews more recent epidemiological reports. Finally, shortcomings of existing literature are described in light of the biopsychosocial perspective.

**Early research**

The first discussion regarding mental health problems experienced by fathers during the perinatal period was published by Zilboorg in 1931. In his journal article, Zilboorg (1931) wrote about the difficulties faced by men adjusting to fatherhood. However, to my knowledge, it was not until 1955 that the findings of the first research investigating the mental health of expectant fathers was published. Curtis (1955), while investigating how psychiatric problems affected men’s adaptation to fatherhood using an animal-drawing and story-telling projective task in 55 men, reported that expectant fathers, with no known psychiatric problems, were able to maintain greater emotional adaptation to fatherhood and had a comparatively stable unconscious image of themselves as a capable and loving father figure; on the other hand, fathers with psychiatric problems, were unable to maintain an emotional adaptation to fatherhood and were unable to form a helpful or stable image of themselves as a capable and
loving father figure. However, as noted by Ballard and Davies (1996), the study by Curtis was of poor quality but was nonetheless significant as it was the first study that focused on men during the perinatal period. Following Curtis’ study, there was a handful of studies (e.g., Cavenar & Butts, 1977; Hartman & Nicolay, 1966; Jarvis, 1962; Wainwright, 1966) that examined fathers around the perinatal period. These studies only reported on the prevalence rates of psychiatric morbidities experienced by the fathers and provided no other useful information such as the course of morbidity and the risk factors or correlates that were associated with these psychiatric morbidities.

The first review of the risk factors of depression in fathers during the perinatal period was published in 1996. Ballard and Davies’ (1996) aim was to report the prevalence rates of depression in men during the postpartum period, the course of depression in new fathers, the associations of paternal depression during the postpartum period with psychiatric morbidity, and treatment programs for new fathers experiencing depression across studies, from the United Kingdom and America, that had been published up to 1996. A total of 45 studies were reviewed. Ballard and Davies found that more than 10% of men in the reviewed studies had an occurrence of depression in the postnatal period; the strongest predictors of this depression for men were having depressed partners, having an unsupportive relationship, and being unemployed. They also found that depression in men during the postnatal period had an important impact on the emotional development of the infant. Interestingly, not one study in Ballard and Davies review investigated the antenatal period. Ballard and Davies also found that there were no intervention or treatment programs available for fathers experiencing depression during the perinatal period.
Prevalence rates for depression in recent studies

Prevalence rates for depression, as measured by various screening tools, across the perinatal period in women living in high-income countries are reasonably consistent across studies with findings indicating that between 12 and 20% (approximately 10% of pregnant women and 13% who have recently given birth) of women experience depression (with a commonly reported estimate of 13% (period prevalence)) (Bennett, Einarson, Taddio, Koren, & Einarson, 2004; Fisher et al., 2012; Josefsson, Berg, Nordin, & Sydsjö, 2001; Mao, Zhu, & Su, 2011; O’Hara & Swain, 1996; Serhan et al., 2013). Findings regarding the prevalence rates of non-clinically diagnosed depression for men during their partner’s pregnancy and in the afterbirth have been variable with studies reporting rates that range from 0.7 to 23.8% (antenatal prevalence rates range: 3.9 to 18.2%) (Paulson & Bazemore, 2010a; Wee et al., 2013; Wee, Skouteris, Pier, Richardson, & Milgrom, 2011). Paulson and Bazemore’s (2010a) meta-analysis of paternal depression during the perinatal period across 43 studies, in a range of high-income countries, reported an overall meta-analytic rate of 10.4% which was significantly higher than that of the general US population of approximately 4.8% (Kessler et al., 2003a), or the Australian estimate of 3.1% (Australian Bureau of Statistics (ABS), 2007). The significantly higher rate of men experiencing elevated levels of depressive symptoms across many countries, as compared to men at other life stages, suggests that paternal depression during the perinatal period does not happen by chance and is not confined to certain cultures or territories, albeit caution is needed while interpreting the prevalence rates in this

---

1 Wee et al. (2013) and Wee et al. (2011) are peer-reviewed papers I have published during the course of my PhD candidature (see Chapter 2 and 3).
meta-analysis as depression was assessed by self-report measures rather than diagnostic tools (Paulson & Bazemore, 2010b; Thombs, Roseman, & Arthurs, 2010).

In Australia, based on data collected from 3,471 fathers with children aged 0-5 years in the Longitudinal Study of Australian Children (LSAC), Giallo et al. (2012) reported that 18.4% (accrued prevalence rate of 3 to 12 months postpartum) of fathers were depressed during the first year postpartum. They also found that fathers with newborns were 1.38 times more likely than the general Australian adult male population (both fathers and not, aged 18 to 85; data from the 2007 Australian National Survey of Mental Health and Wellbeing, NSMHWB (ABS, 2007)) to be psychologically distressed.

Irrespective of the prevalence, there is a paucity of research related to the experience of depression in fathers during the perinatal period (Wee et al., 2013; Wee et al., 2011). To date, most studies have just explored uni-directional associations between potential correlates and/or risk factors for depression during the ante-and postnatal period in men, with most studies focusing on identifying correlates or risk factors of paternal depression in the postpartum (Wee et al., 2011). Studies that were conducted through pregnancy had limited (most only have one collection time point) assessment points during gestation (e.g., Areias, Kumar, Barros, & Figueiredo, 1996; Boyce, Condon, Barton, & Corkindale, 2007; Condon, Boyce, & Corkindale, 2004; Deater-Deckard, Pickering, Dunn, & Golding, 1998). Understanding the risk factors of paternal depression during the antenatal period is just as important as understanding the risk factors of depression in men in the postpartum period, given that the prevalence of elevated antenatal depressive symptoms is as high as the prevalence of elevated depressive
symptoms in men during the postnatal period (Wee et al., 2011). Therefore, a complete model of the development of depressive symptoms during the perinatal period which is multi-factorial and inclusive of bio-psycho-social variables is needed for men, just as it is needed for women (Ross, Sellers, Gilbert Evans, & Romach, 2004). Previous research has been informative but has been limited in terms of theory building. Hence, a more rigorous and systematic investigation of direct and indirect (mediators and moderators) predictors of depression in men during the ante-and postnatal periods is needed.

**Gaps in the literature**

As mentioned above, research into men’s depression during the perinatal period is clearly still in its infancy with further research warranted. I highlight here two such areas of research that require further investigation. Some of the few studies (e.g., Buist, Morse, & Durkin, 2003; Field et al., 2006) that were done showed that anxiety and stress symptoms often co-exist with depressive symptoms in men during their partner’s pregnancy. Field et al. (2006) found that men who were experiencing depressive symptoms during their partner’s pregnancy would often experience anxiety symptoms as well. It was also found that men whose pregnant partners were depressed experienced significantly higher levels of anxiety and depression than men whose partners were not depressed. A similar effect was found in women who were partnered with a depressed partner. In another study that investigated factors affecting first-time fathers’ transition to parenthood, Buist et al.’s (2003) found that stress (related to gender role) in men, measured during their partner’s pregnancy and at four months post-birth, was predictive of depressive symptoms. Anxiety was also
found, in this study, to be associated with paternal depressive symptoms during their partner's pregnancy. Despite knowing that depressive, anxiety and stress symptoms co-exist in men during the perinatal period, the temporal inter-relationship between these variables has never been investigated. Knowing the inter-relationship between these symptoms in men during their partner’s pregnancy can help clinicians treating emotionally distressed fathers to know which symptoms should be treated first. This will also help prevent depression in men during the postpartum as antenatal distress symptoms are found to be predictors of depression post-birth (Wee et al., 2011).

Another important area that has been over-looked in the research of paternal depression during the perinatal period is the creation, transmission, and maintenance of emotional states (e.g., depression and anxiety) that are attached to the major social roles (e.g., spouse) with which a person is involved (reciprocal influence) (Pearlin, 1989). While several studies (e.g., Matthey, Barnett, Ungerer, & Waters, 2000; Teixeira, Figueiredo, Conde, Pacheco, & Costa, 2009) have examined depressive symptoms in both men and their partners during the perinatal period, this was done using an individualistic model which neglects the interpersonal phenomena of interdependence and reciprocal influence between partners (Kahana & Young, 1990; Peugh, DiLillo, & Panuzio, 2013; Pruchno, 1994; Thompson & Walker, 1982). Assuming independence when interdependence is present in the data can significantly bias findings and their interpretation (Gonzalez & Griffin, 1997; Peugh et al., 2013).
Biopsychosocial perspective

Currently there are two broad theories that could also help explain depression during the perinatal period: namely the biomedical perspective and the biopsychosocial perspective. The biomedical perspective suggest that the underlying cause of all illness or diseases can be attributed to a virus, gene or developmental abnormality, or an injury (Engel, 1977). On the other hand, the biopsychosocial perspective posit that illness, including mental illness, is caused by biological, psychological (thoughts, emotions, and behaviours etc.), and social (socio-economical, socio-environmental, and cultural etc.) factors (Slade, 2002). In this thesis, I will demonstrate that the biopsychosocial perspective is a more relevant model in explaining the development of depression in men during the perinatal period.

While studies with women indicated that biological/hormonal and other physical changes that occur during pregnancy and after birth are related to the development of depression (e.g., Douma, Husband, Donnell, Barwin, & Woodend, 2005; Glover & Kammerer, 2004; Henderson, Gregoire, Kumar, & Studd, 1991; Ingram, Greenwood, & Woolridge, 2003; Karuppaswamy & Vlies, 2003), other studies suggest that the most significant factors that impact depression in women around the perinatal period are not biomedical variables. Meta-analytic studies that were done concur on a core list of six risk factors for postnatal depression in women which exert the largest effects, namely antenatal depression, antenatal anxiety, major life events, low social support levels, depression history and low self-esteem (Beck, 1996, 2001; O'Hara & Swain, 1996). A large prospective study of >40,000 Australian women (Milgrom et al., 2008a) confirmed that 5 of these risk factors (antenatal depression, antenatal
anxiety, major life events, low social support levels, and depression history; the five identified as the most important by the synthesis of Robertson et al. (Robertson, Grace, Wallington, & Stewart, 2004) were readily measurable in the perinatal population and that each had substantial odds ratios associated with them. Therefore, biopsychosocial variables, instead of only biomedical factors, are impacting on depression in women who physically go through pregnancy and childbearing. The five biopsychosocial risk factors identified above have also been shown by my systematic review (Wee et al., 2011; see Chapter 2) to be associated with depression in men during the perinatal period.

Even though men do not physically go through the actual process of pregnancy and childbearing, there is a body of literature that demonstrates that there are biochemical and hormonal changes that occur in men during the transition to fatherhood (e.g., Edelstein et al., 2014; Feldman, Gordon, Schneiderman, Weisman, & Zagoory-Sharon, 2010; Gettlera, McDadea, Feranile, & Kuzawa, 2011; Storey, Walsh, Quinton, & Wynne-Edwards, 2000). For example, it was found that during the transition to fatherhood, testosterone levels in men decrease rapidly (Gettlera et al., 2011). In a study, unrelated to childbirth, by Shores, Moceri, Sloan, Matsumoto, and Kivlahan (2005) using 748 men who were 50 years or older, low levels of testosterone have been found to be associated with increased risk of depression in men over the age of 50 years. Research is needed to determine if this is also the case for men younger than 50 years of age who are transitioning into fatherhood. Besides changes in testosterone levels, it was also found that neuropeptide oxytocin (OT) increases in fathers when they come in tactile contact with their infants (Feldman et al., 2010); this increase in OT helps to boost the father-infant bond (Weisman, Zagoory-
Sharon, & Feldman, 2012, 2014). The increase in OT during tactile contact and its association with parent-infant bond have also been found to be similar in mothers (Pratt et al., 2015). Furthermore, low OT levels are implicated in mothers suffering from perinatal depression (Apter-Levi, Feldman, Vakart, Ebstein, & Feldman, 2013; Kim et al., 2014). However, it is not known if low levels of OT are risk factors for depression in men during the perinatal period. In fact, the literature on the neurobiological risk factors for depression in men during the perinatal period is missing. Therefore, it is important to investigate perinatal depression in men using the biopsychosocial perspective as a framework.

However, investigating biological risk factors for depression in men during the perinatal period is beyond the scope of this thesis; therefore this thesis will mainly focus on the psychological and social aspects of this model when evaluating the development of elevated distress symptoms through the perinatal period for men.

Thesis aims and overview

Given the paucity of research, the focus of this thesis is on men’s depressive symptoms in the antenatal period. That is, the overall aim of this thesis is to extend the research conducted to date by adopting a prospective longitudinal design, increase the time points of assessment through pregnancy to ensure the measurement of variables is more systematic and rigorous, and increase the number of factors evaluated as potential correlates or predictors of elevated depressive symptoms in men during this life stage. The following chapter, Chapter 2 presents a systematic review of the literature on the correlates and predictors of depressive symptoms in men during both the ante- and postnatal period. Articles for this systematic review were sourced from five databases:
Medline, PsychINFO, Academic Search Premier, Health Source: Nursing/Academic Edition, and CINAHL; and searches were limited to English papers published between January 1996 and August 2009. This review was published in the Journal of Affective Disorders in May 2011.

Chapter 3 presents a review of the literature on what we know about paternal depression during the perinatal period. Specifically, this study systematically identified and reviewed studies: 1) comparing how depression during the perinatal period manifests differently in men than women and if men cope with their depression differently as compared to women; 2) comparing the risk factors of paternal depression during the perinatal period and the risk factors for general depression in men; and 3) that investigated effective interventions for men suffering from depression during the perinatal period. This review was published in the British Journal of Midwifery in May 2013. To my knowledge, this paper was the only study that systematically identified and reviewed intervention studies, published between January 2000 and July 2012, that focused on fathers exclusively or on both fathers and mothers. This review was informed by the PRISMA statement (Moher, Liberati, Tetzlaff, Altman, & Group, 2009). Articles for the review were sourced from Academic Search Complete, CINAHL with Full Text, Health Source: Nursing/Academic Edition, MEDLINE, Psychology and Behavioral Sciences Collection and PsycINFO databases; and searches were limited to English language papers.

Chapters 4-9 present updates to the systematic reviews in Chapter 2 and 3 and the findings of two empirical studies that were conducted to address the overall aim of this thesis, as well as a detailed overview of the methodology of these studies. The aim of the Chapter 4 was to provide an update to the systematic
reviews presented in Chapter 2. Chapter 5 presents an update to the systematic review of current intervention programs that were designed specifically for men who were suffering from depression during the perinatal period found in Chapter 3. Chapter 5 also evaluates the effectiveness of the current intervention programs using the grading and recommendations assessment, development and evaluation (GRADE) approach (Brożek et al., 2009; Guyatt et al., 2011). This chapter is followed by a detailed outline of the general methodology of the current thesis (Chapter 6). The aim of the first empirical study (Chapter 7) was to investigate the inter-relationships between depressive, anxiety and stress symptoms as these variables are known to co-exist in men during their partner’s pregnancy. In this chapter the differences in findings between men and their partners, and between first-time fathers and non-first-time fathers will also be presented. This study was submitted to the Journal of Reproductive and Infant Psychology and was accepted for publication in May 2015. The aim of the second empirical study (Chapter 8) was to examine the creation, transmission, and maintenance of distress (depression, anxiety and stress as composite affects) that is unique between an individual and his partner (dyads) (Pearlin, 1989) during pregnancy (reciprocal influence). This chapter also presents the findings on the moderating effect of both men’s and their partner’s perceived social support on levels of distress symptoms. This study was submitted to the Journal of Reproductive and Infant Psychology in June 2015. Chapter 9 provides a general discussion of the findings from all the studies and the contributions this thesis makes to the literature. Chapter 9 also addresses the strengths, limitations, and implications of the findings of this thesis.
References


*Australian and New Zealand Journal of Psychiatry, 41*(9), 718-725.


Chapter 2

Correlates of depressive symptoms in fathers pre- and post birth: A systematic review

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Abstract

**Background:** Contemporary research findings suggest that depression during the ante- and postnatal periods is a significant problem not only for women but also for many men. This paper provides a conceptual and methodological review of the literature on cross-sectional and prospective correlates of depressive symptoms in men during both pregnancy and the postpartum period. **Methods:** The search, via several electronic databases, was limited to English papers published between January 1996 and August 2009, and identified 30 relevant articles. **Results:** The most common correlate of paternal depressive symptoms pre- and post birth was having a partner with elevated depressive symptoms or depression; poor relationship satisfaction was also frequently associated with elevated depressive symptoms or depression in men. **Limitations:** There were significant methodological limitations of existing studies, including small sample sizes; the use of cross-sectional designs; varied measures of depression; focus on depression in the postpartum only; and in the few longitudinal gestational studies, the inclusion of only one assessment point. The limitations of the current systematic review include the inclusion of only papers written in English and potential publication bias, where studies with null findings are less likely to be published. **Conclusion:** The scientific study of predictors of men's depressive symptoms pre and post birth remains in its infancy. Given the implications of clinical depression in men both during the gestational and postpartum periods, further systematic investigation of direct and indirect predictors of elevated depressive symptoms in men during this time is warranted. **Keywords:** Father; Men; Antenatal depression; Postnatal depression; Pregnancy, Postpartum.
Introduction

Antenatal and postnatal depression is a well-recognised health issue in women. Antenatal depression affects approximately 12 to 20% of expectant mothers (Leigh & Milgrom, 2008) and depression after birth affects about 10 to 15% of women (Tammentie et al., 2004). Antenatal depression affects a woman's ability for self-care and may also contribute to other problems such as inadequate nutrition, drug or alcohol abuse and poor antenatal clinic attendance (Leigh & Milgrom, 2008). Postnatal depression may commonly result in a predisposition to fret over the newborn's health and wellbeing (Henshaw & Cox, 1995), and the mother–infant relationship may be affected (Milgrom et al., 2008b). Both antenatal depression and postnatal depression are typified by persistent sadness or a moderated ability to experience pleasure, irritability, feelings of low self-esteem and manifest anxiety (Milgrom & McCloud, 1996). Sufferers often are constantly fatigued, as well as having alterations in sleep patterns and appetite. According to the Diagnostic and Statistical Manual of Mental Disorders IV (APA, 2000), postnatal depression is no different from other types of depressive conditions in terms of symptomatology.

There is a prevalent belief that only women are affected by depression during pregnancy and the postpartum period and, as a consequence, most research to date has focused on mothers. However, there is evidence that men are also affected by depression in the antenatal and postnatal periods (e.g., Fletcher et al., 2006; Matthey et al., 2003). Men can experience their partner's pregnancy and the birth of a new baby as a stressful time filled with new challenges and adjustment to routines (Condon, 2006). These stressful changes can lead to depression for men in similar ways that it does for some women (Solantaus & Salo, 2005).
Fletcher et al. (2006) found that the rate of diagnosed depression in new fathers at six weeks postpartum was around 2% to 5%. Other researchers have reported that this rate of diagnosis can be as high as 10% (e.g., Ballard & Davies, 1996; Lunn, 2008).

Both maternal and paternal depressions following childbirth can also have detrimental effects on a couple's relationship, the parent–child relationship, and on children's development (e.g., Cornish, McMahon, & Ungerer, 2008; Deater-Deckard et al., 1998; Kane & Garber, 2004; Paulson, Dauber, & Leiferman, 2006; Ramchandani, Stein, Evans, & O'Connor, 2005; Ramchandani et al., 2008a; Ramchandani et al., 2008b). Likewise, depression during the antenatal period has negative effects on men as it does for women. Best estimates for the prevalence rate of depression during pregnancy vary widely for men (as well as for women) across published studies to date due to small sample sizes and different instruments, ranging from diagnostic interviews to screening tools. For example, Areias et al. (1996), using semi-structured interviews, reported that 4.8% of men (out of 42 men) in their study were depressed during their partner's pregnancy, while Boyce et al. (2007) and Condon et al. (2004), using the General Health Questionnaire (GHQ, Goldberg, 1978), reported that 18.6% of the men in their study (out of 312) were considered cases for depression during pregnancy (≥5 on the GHQ). Buist et al. (2003), using a score of greater than 10 on the Edinburgh Postnatal Depression Scale to indicate depression (EPDS, Cox, Holden, & Sagovsky, 1987), showed that 12% of their sample of 294 men were distressed at 26 weeks pregnancy and 8.7% at 36 weeks pregnancy. In contrast, in a large cohort study, Ramchandani et al. (2008a) reported a lower prevalence of 2.3%
men showing elevated depressive symptoms (≥12 on the EPDS) at 18 weeks pregnancy.

To date, the correlates of depressive symptoms in men post childbirth have been reviewed in two literature reviews (Ballard & Davies, 1996; Schumacher, Zubaran, & White, 2008) and one integrated literature review (Goodman, 2004). All three reviews revealed that having a depressed partner, or a partner with a high level of depressive symptoms, was a strong correlate of elevated symptoms of depression in fathers in the postpartum. Having an unsupportive marital relationship, paternal unemployment (Ballard & Davies, 1996), immaturity, as well as unplanned pregnancy (Schumacher et al., 2008) were also factors that were found to be associated with elevated paternal depressive symptoms, or a diagnosis of clinical depression, post birth.

To our knowledge, there has been no systematic review that has focused on correlates of depressive symptoms in men during pregnancy and after the birth of the baby. Given the critical period of both pregnancy and the postpartum for the development of depression in men, and the fact that a better understanding of the development of depression in fathers both during the antenatal and postnatal periods is clearly warranted, we have undertaken a systematic conceptual and methodological review of the literature on correlates of depressive symptoms in expectant fathers pre- and post birth.

**Method**

**Search strategy**

Prior to commencing the review, a search of databases (e.g. Academic Search Premier, Health Source: Nursing/ Academic Edition) revealed no
systematic review conducted on correlates of depressive symptoms in fathers pre- and post birth. Articles were sourced from five databases: Medline, PsychINFO, Academic Search Premier, Health Source: Nursing/Academic Edition, and CINAHL. The search was limited to English language papers published between January 1996 and August 2009, and used terms from within the title and abstracts as outlined in Box 1. In addition, a lateral approach involving a review of reference lists in papers identified was undertaken.

*Box 1.*

Search terms and strategy

| Father (s) OR men OR paternal
| Combined with each of the following:
| Depression
| Antenatal depression/depressive symptoms OR prenatal depression/ depressive symptoms
| Pregnancy OR birth
| Baby OR postpartum

\[= OR\]

Initially, 907 articles were identified and the abstracts were read by the first author to assess suitability. Studies were excluded if they did not include men or fathers as participants, were not specific to either pregnancy or the first year post birth, were literature review papers, and did not measure either clinical depression or depressive symptoms. This resulted in 64 articles, all of which were read by authors (KYW and HS) in their entirety. A further 37 studies were
rejected because they met one of the above exclusion criteria, and one paper was rejected because it was a meta-analysis concerned with the magnitude and direction of covariation between depression in men during the postpartum and their children's functioning, not correlates of paternal depression post birth (Kane & Garber, 2004); 26 articles remained that were relevant to the current review. All authors read these 26 articles and agreed collectively on the data to be extracted across each of the studies.

Results

Details of the included studies, their design, sample size, and main outcome findings are summarised in Tables 1 and 2. Given that researchers across the studies set different criteria for the classification of “depression” and/or used different measures to assess levels of depressive symptoms or different tools to diagnose clinical depression, we have added a column to Tables 1 and 2 that provides the criterion used in each study. Furthermore, for ease of presentation of the findings, the term “depression” is used throughout the Results section below, even when the measure employed by researchers was not a diagnostic tool.

Qualitative study focused on the postpartum period

Of the 26 empirical studies, only one was a qualitative study. In Davey et al.'s (2006) study, men's subjective experiences of postnatal depression and their participation in a six-week group treatment program specifically designed for men was examined. The men in this study were partners of women who had been clinically diagnosed with postnatal depression in the first year postpartum. The diagnoses were made using clinical interviews and a range of self-report tools.
The treatment program, attended by the men, included psycho-educational and cognitive behavioural components including information about postnatal depression and maternal mood disorders; exploration of personal belief systems surrounding fathering; relaxation and stress management strategies; communication skills and conflict resolution training; information on cognitive behavioural models of depression; and cognitive restructuring techniques. Men reported experiencing their partner's postnatal depression as overwhelming, isolating, stigmatizing, and frustrating due to the miscommunications that arose within the environment of postnatal depression. Changing roles and expectations of men in Australian society were emphasised as a possible contribution to heightened levels of stress and depression by the men during focus group interviews after the treatment program. The men also felt that their usual functioning and coping skills were not adequate in handling their depression during the postnatal period, and that there was a lack of support and help available to them specifically. As a result of their participation in the treatment program, men reported in the focus group interviews, that levels of depression and stress were lowered (Davey et al., 2006); however, an objective measure of depressive symptoms was not taken post intervention to validate these perceptions.

Cross-sectional studies

Eleven of the 26 empirical studies were cross-sectional in design. Details of the main aim, sample, design, methodology and findings of these studies are summarised in Table 1. Only one of these studies examined the antenatal period. Couple comorbidity was reported in the prenatal period by Field et al. (2006). Men whose pregnant partners were depressed experienced significantly higher
levels of anxiety and depression. A similar effect was found in pregnant women who were coupled with a depressed partner.

Table 1. Summary of Cross-Sectional Studies

<table>
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<tr>
<th>Authors and country of study</th>
<th>Main aim/research questions</th>
<th>Sample</th>
<th>Design</th>
<th>Methodology (including measures used)</th>
<th>Criteria used to define depression</th>
<th>Main findings</th>
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<tr>
<td>Bielawska-Batorowicz, E., and Kossakowska-Petrycka, K. (2006) Poland</td>
<td>The aim was to investigate the prevalence and correlates of depressive mood in men during postpartum.</td>
<td>80 primiparous couples.</td>
<td>Couples were sent questionnaires to complete 3 months post birth.</td>
<td>Fathers: Questionnaires included measures of depressive symptoms, personality and neuroticism, social support, marital satisfaction, and prenatal expectations concerning life with a baby. Mothers: questionnaires included measures of depressive symptoms and marital satisfaction. Depressive Symptoms: The Edinburgh Postnatal Depression Scale (EPDS) was completed by fathers and mothers. Participants scoring ≥ 13 on the EPDS were considered depressed. (EPDS: screening tool).</td>
<td></td>
<td>Postnatal depression in men was associated with: the level of their partner's depression ($r = .76, p &lt; .001$), the discrepancy between prenatal expectations and experiences related to family and social life after childbirth ($r = -0.68, p &lt; .001$), and low satisfaction with the marital relationship ($r = -0.65, p &lt; .001$). Men's neuroticism and age were not related to paternal postnatal depression.</td>
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<td>Bronte-Tinkew, J., Moore, K. A., Matthews, G., and Carrano, J. (2007) USA</td>
<td>The aim was to examine the sociodemographic correlates of symptoms of depression in men and the association between depression and men's involvement with their infants.</td>
<td>2,139 resident fathers in the Fragile Families and Child Well-being 12 Month Father Survey.</td>
<td>Data analysed at the 12 month post birth time point..</td>
<td>Questionnaires included measures of father engagement, father's aggravation/stress in parenting, father–mother relationship quality, coparental relationship supportiveness, depression, sociodemographic characteristics, substance use, criminal history, and child characteristics detailing the child’s gender (female children are omitted from the study). Depression: The Composite International Diagnostic Interview–Short</td>
<td>Participants reporting 3 or more symptoms of father engagement, father's aggravation/stress in parenting, and depression, sociodemographic characteristics, substance use, criminal history, and child characteristics are considered to have major depression. (CIDI-SFMD: diagnostic tool). Race (7.0% Non-Hispanic Blacks and 7.7% Hispanics as compared to 6.8% who are Non-Hispanic Whites), marital status (6.5% prevalence rate as compared to 2.7% in those who were married, 1.6% in those who were never married or 0.6% in those who were cohabiting), and employment status (14.3% as compared to 8.3% in those who were employed) were associated with major depression in men at 12 months postpartum.</td>
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The aim was to study the relationship between paternal mood and infant temperament.

98 fathers of newborn babies (only 48 completed the depression-screening measures).

Participants were screened at 4 to 6 weeks postpartum: Questionnaires includes measures of depression and anxiety. At 6 months postpartum: Questionnaires includes measures of depression and anxiety, infant temperament, couple relationship dynamics, father–child interaction and father attitudes, alcohol use, and stressful life events.

Depressive symptoms: The Hospital Anxiety and Depression Scale (HADS), EPDS and the Brief Patient Health Questionnaire (Brief PHQ) were the measures of depression completed by the men.

Participants scoring >10 on the Brief PHQ were considered depressed. (Brief PHQ: diagnostic tool).

The EPDS and the HADS were just used for comparison purposes. (Both EPDS and HADS: screening tools). Participants scoring >10 on the Brief PHQ were considered depressed. (Brief PHQ: diagnostic tool).

Fathers who scored higher on depression, had more traditional attitudes towards fathering, and had increased recent life events, reported a higher infant fussiness scores. Better couple relationship quality was related to lower fussiness scores. The experience of adverse recent life events was also related to paternal depression in this study and fathers of non-white ethnicity were found to be more depressed than Caucasian fathers in this study (ratio of 4:1).

The aim was to investigate psychological correlates of depression in men and their partners in the first postnatal year.

193 couples (92 men completed all assessments)

Structured interviews and questionnaires were completed by both parents independently.

Interviews of the women occurred on the day after admitting into hospital or during their day hospital attendance, or 1 to 6 months postpartum for those women attending early childhood centres.

Men were interviewed after the women’s interviews.

Both parents: Questionnaires included measures of depression, personality, and marital satisfaction.

A structured interview was used to obtain demographic information; the type, source and frequency of social supports; detailed obstetric, perinatal and psychiatric history; drug and alcohol use; and history of childhood abuse and current domestic violence.

Depression: The EPDS was the measure of depression completed by fathers and mothers.

Fathers: The revised Beck Depression Inventory (BDI) and the General Health Questionnaire-30 (GHQ-30) were completed by fathers only.

The men who scored ≥ 11 on the EPDS, ≥ 10 on the BDI, and ≥ 5 on the GHQ were considered depressed. (EPDS, BDI and GHQ: screening tools).

Postnatal depression in men was associated with: the state of the marriage or de facto relationship, the perception of the partner’s personality style, the partner’s unresolved issues (e.g., past sexual abuse), maternal postnatal blues, the partner’s coping capacity (e.g., postnatal anxiety after a previous pregnancy, infant temperamental problems), and the partner’s view of the relationship with them ($R^2 = .59, p < .001$ on the EPDS and $R^2 = .62, p < .001$ on the BDI).

Depression in men was also found to positively correlate with depression in the women ($r = .34, p < .001$ on the revised Beck Depression Inventory (BDI, Beck et al., 1979) and $r = .23, p < .05$ on the GHQ (Goldberg, 1978).

For women, the main correlates of maternal postnatal depression their own personality, as well as perinatal experiences (such as baby blues) and infant temperament problems.

Field, T. M., Diego, M., Hernandez-
<table>
<thead>
<tr>
<th>Reif, M., Figueiredo, B., Deeds, O., Contogeorgos, J., et al. (2006) USA</th>
<th>depression and other mood states in both depressed and non-depressed pregnant women and their depressed and non-depressed partners.</th>
<th>second trimester of pregnancy.</th>
<th>Depression: The Center for Epidemiological Studies-Depression (CES-D) scale was used as a measure of depression in both parents. CES-D were considered depressed. (CES-D: screening tool).</th>
<th>anxiety and a higher degree of daily hassle compared to non-depressed fathers. When comparing depressed fathers to depressed mothers, fathers experienced slightly lower anxiety and depression, but higher anger and daily hassles. Men experienced higher levels of anxiety, anger and daily hassles compared to women. Women with a depressed partner experienced higher levels of anxiety and depression as compared to women with a partner who is not depressed. Men with a depressed partner experienced higher levels of anxiety and depression compared to men with a partner who is not depressed.</th>
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<tbody>
<tr>
<td>Gao, L.-L., Chan, S. W.-C., and Mao, Q. (2009) Mainland China</td>
<td>The aim was to compare the prevalence of maternal and paternal depression postnatally and its relationship with perceived stress and social support in first-time parents.</td>
<td>130 couples</td>
<td>Data were collected from the participants at 6 to 8 weeks postpartum</td>
<td>Maternal and paternal depression scores and perceived stress did not differ significantly. Fathers reported lower levels of perceived social support. Participants who reported higher perceived social support had fewer depressive</td>
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The aim was to determine the occurrence of psychological difficulties in first-time parents, including depression, panic disorder, acute adjustment disorder with anxiety, and phobia. Participants completed a variety of self-report measures at 6–8 weeks postpartum. A home interview was also done at week 6 where the men and women were interviewed separately using the Diagnostic Interview Schedule (DIS): Depression and Anxiety modules (Panic, Phobia, and Generalised Anxiety Disorder/Adjustment disorder with anxiety).


408 women and 356 men who were expecting their first child.

Participants who reported a higher perceived stress were more depressed ($r = .58, p < .01$).

Maternal and paternal depression were associated ($r = .37, p < .01$).

The DIS, the EPDS, the CES-D and Profile of Mood States were used to determine the presence of depression, panic disorder, acute adjustment disorder with anxiety and phobia. The results indicated that there were no difference in the rate of depression, panic disorder, acute adjustment disorder with anxiety and phobia between the men and women.

65.6% of the women who had a history of anxiety disorder had postnatal depression in this study compared to only 29.4% of the women who only had a history of depression who also had postnatal depression. There was no significant difference in the rate of history of mental disorders in men who were postnatally depressed.

For women who met the criteria for postnatal depression, anxiety, or both of these, about 1 in 10 of their partners also met the criteria.

For men who met the criteria for postnatal depression, anxiety, or both of these, their
<table>
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<tr>
<th>Study</th>
<th>Country</th>
<th>Objective</th>
<th>Sample Size</th>
<th>Methods</th>
<th>Participants</th>
<th>Findings</th>
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<tr>
<td>Pinheiro, R. T., Magalhaes, P. V. S., Horta, B. L., Pinheiro, K. A. T., da Silva, R. A., and Pinto, R. H. (2006)</td>
<td>Brazil</td>
<td>The aim was to describe the prevalence of, and factors associated with, postnatal depression in men</td>
<td>A population-based random sample of 386 couples.</td>
<td>Participants were assessed from the 6th to the 12th weeks postpartum.</td>
<td>Questionnaires included measures of sociodemographic characteristics, alcohol misuse and depressive symptoms.</td>
<td>Postnatal depression in men was not associated with sociodemographic variables, but was significantly associated with alcohol-related disorders.</td>
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<td>Roberts, S. L., Bushnell, J. A., Collings, S. C., and Purdie, G. L. (2006)</td>
<td>New Zealand</td>
<td>The aim was to compare the psychological health of men whose partners had postnatal depression (index group) with men whose partners were not postnataally depression (comparison group).</td>
<td>58 men in the index group and 116 in the comparison group.</td>
<td>Participants completed the assessments when their children were less than 13-months-old.</td>
<td>Questionnaires included measures of depression, anxiety, non-specific psychological impairment, alcohol use, and symptoms of aggression.</td>
<td>Men whose partners had postnatal depression had more symptoms of depression, aggression and non-specific psychological impairment, and had higher rates of depressive disorder, non-specific psychological problems and problem fatigue than men whose partners were not postnataally depressed.</td>
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<tr>
<td>Authors</td>
<td>Country</td>
<td>Study Design</td>
<td>Sample Size</td>
<td>Methods</td>
<td>Findings</td>
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<td>Wang, S.-Y., and Chen, C.-H. (2006)</td>
<td>Taiwan</td>
<td>The aim was to compare the differences in stress, social support, self-esteem, and depression in fathers and mothers during the postpartum period.</td>
<td>83 postnatal couples.</td>
<td>Participants were recruited 2 to 3 day after childbirth and assessed at 6 weeks postpartum. Questionnaires included measures of stress, social support, self-esteem, and depression. Depression: The BDI was the measure of depression completed by the women and men. The men who scored &gt; 10 on the BDI were considered depressed. (BDI: screening tool).</td>
<td>There was a higher rate of postnatal depression in women than in men. For those men who were first-time fathers, social support was perceived to be lesser than their partners, but both parents experienced similar levels of depression. There were gender specific predictors of postnatal depression. High stress levels were linked to postnatal depression in women, whereas low self-esteem was linked to the condition in men.</td>
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<tr>
<td>Zelkowitz, P., and Milet, T. H. (1997)</td>
<td>Canada</td>
<td>The aim was to investigate the perceptions of stress and support in the postpartum period for two groups of fathers: those whose wives were postnatally depressed (the index group) and those whose wives were not postnatally depressed.</td>
<td>50 men whose spouses had postnatal depression and 50 men whose spouses were not postnatally depressed.</td>
<td>Participants completed assessments around 6 weeks postpartum.</td>
<td>Men in the Index group reported more stress, particularly from work (42% of the index group as compared to 14% from the control group, ( p &lt; .01 )) and economic pressures (20% of the index group as compared to 6% of the control group, ( p &lt; .05 )). Index men were less likely to report support from in-laws, other relatives, and friends (40% (index) versus 60% (control); 44% (index) versus 66% (control); 38% (index) versus 62% (control).</td>
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respectively, all at \( p < .05 \)).

Stress, especially work-related stress, and not low support, was associated with more negative perceptions of the marriage, the parental role, and infant behaviour by fathers regardless of group.

In the cross-sectional studies that examined the postnatal period, several correlates were identified. The most common correlate of depression experienced post birth by men was having a partner with depression (Bielawska-Batorowicz & Kossakowska-Petrycka, 2006; Dudley et al., 2001; Gao et al., 2009; Matthey et al., 2003; Pinheiro et al., 2006; Roberts et al., 2006; Zelkowitz & Milet, 1997), and low social support (Gao et al., 2009; Roberts et al., 2006). Low satisfaction with the marital relationship /poor state of the marriage or relationship also emerged as a significant correlate in five of the studies (Bielawska-Batorowicz & Kossakowska-Petrycka, 2006; Bronte-Tinkew et al., 2007; Davé et al., 2005; Dudley et al., 2001; Zelkowitz & Milet, 1997).

Other less common correlates included being divorced/separated, being of an ethnic minority race, non-white ethnicity or unemployed (Bronte-Tinkew et al., 2007), a high discrepancy between prenatal expectations and experiences related to family and social life after childbirth (Bronte-Tinkew et al., 2007), parenting stress (Bronte-Tinkew et al., 2007), less father–child engagement (Bronte-Tinkew et al., 2007), higher perceived stress (Gao et al., 2009; Roberts et al., 2006) particularly from work and economic pressures (Zelkowitz & Milet, 1997), low self-esteem (Wang & Chen, 2006), having a partner with anxiety (Matthey et al.,
negative perceptions of the parental role and infant development (Zelkowitz & Milet, 1997), problem fatigue (Roberts et al., 2006), high levels of aggression (Roberts et al., 2006), perception of a difficult infant temperament (Davé et al., 2005), the experience of adverse recent life events (Davé et al., 2005), drug and alcohol misuse (Pinheiro et al., 2006), lower perceived social support (Wang & Chen, 2006), the partner's unresolved issues (e.g., past sexual abuse), postnatal blues, coping capacity (e.g., postnatal anxiety after a previous pregnancy and infant temperamental problems) and personality style (Dudley et al., 2001). Roberts et al. (2006) also found that men whose partners were depressed were more likely to have three or more comorbid psychological disturbances, including depressive disorder, anxiety disorder, hazardous alcohol use, problem fatigue, and general affective problems.

In addition to the correlates of paternal depression noted above, Matthey et al.'s (2003) findings showed that there was no apparent relationship between history of mental disorders and the development of postnatal depression in men. In contrast, whereas 66% of women who had a history of anxiety disorder developed postnatal depression, only 29.4% of women with a history of depression developed postnatal depression. This finding might suggest gender specific predictors for postnatal depression. Matthey et al. concluded that “replication of these pathway findings for women are required before too much hypothesising about why such a difference may exist is warranted” (pp. 144–145).

Longitudinal studies — during the gestational and postpartum periods

Fourteen studies were longitudinal through both the antenatal and postpartum periods. Three of these studies used the Avon Longitudinal Study of
Parents and Children dataset (Deater-Deckard et al., 1998; Ramchandani et al., 2008a; Ramchandani et al., 2008b), and only three papers identified risk factors that were associated with both depression during pregnancy and post birth in men (Castle, Slade, Barranco-Wadlow, & Rogers, 2008; Deater-Deckard et al., 1998; Johnson & Baker, 2004) Details of the main aim, sample, design, methodology and findings of these studies are presented in Table 2.

Table 2. Summary of Longitudinal Studies through the Antenatal and Postpartum Periods

<table>
<thead>
<tr>
<th>Authors and country of study</th>
<th>Main aim/research questions</th>
<th>Sample</th>
<th>Design</th>
<th>Methodology (including measures used)</th>
<th>Criteria used to define depression</th>
<th>Main findings</th>
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<tbody>
<tr>
<td>Areias, M. E. G., Kumar, R., Barros, H., and Figueiroedo, E. (1996) Oporto, Portugal</td>
<td>The aim was to compare and contrast correlates of paternal and maternal depression post birth.</td>
<td>54 primiparous mothers and 42 of their husbands. Participants assessed at 6 months antenatally and at 12 months postnatally and sub-samples of women and men (n = 24 and n = 12 respectively) were also assessed at 3 months postnatally.</td>
<td>Depression: Interviews (Schedule for Affective Disorders and Schizophrenia - SADS and Schedule for Affective Disorders and Schizophrenia - Lifetime – SADS-L) was used to ascertain depression. Questionnaires which included measures of life events, social adjustment, social support, personality, attributional style, obstetric and complications.</td>
<td>Rates of depressive disorder were diagnosed by SADS and SADS-L. (SADS and SADS-L: diagnostic tools).</td>
<td>Prevalence of depression antenatally was 16.7% (9 cases) in women and 2 cases in men (4.8%). 12 women had an onset of depression and 5 remained depressed (these 5 also had an onset of depression antenatally). However, only 2 men (4.8%) were depressed during the same period. 12 months postnatal, 12 more women and 10 men became depressed. Prevalence for the women was 53.7% and for the men 28.6%. Stressful life events, social support, personality traits and attributional styles were linked with occurrence of depression in women during pregnancy and postnatally shown by univariate analyses. The association between social</td>
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**The aim was to investigate the associations with men’s initial high levels of distress during pregnancy.**

- 312 first-time fathers completed their assessments (204 completed the study).
- Assessment done when the women were approximately 20 weeks pregnant and were then reassessed, together with their partners, at 3, 6 and 12 months after the baby was born.

**Questionnaires included measures of distress, general health, mental health, affect, alcohol use, quality of life, adjustment in relationships, social support, the dimensions of care and control between partners in an intimate relationship, and lifestyle and sexual functioning.**

**Distress: The General Health Questionnaire-28 (GHQ-28) was the measure of distress completed by the men.**

- Men scoring > 5 on the GHQ were considered distressed. (GHQ: screening tool).

Main variables that were associated with psychological distress were high levels of neuroticism, dissatisfaction with social support, poor marital relationship and an excess number of additional life events.

Men who had insufficient information about pregnancy and childbirth were also at risk of being distressed.

Transition into fatherhood corresponds with men’s perception of a huge drop in sexual relationship in terms of pleasure and the frequency of sexual activity.

Preponderance of change usually occurs antenatally, with only a minor improvement by the end of the first postpartum year.


**The aim was to investigate the occurrence of the condition in their partners, and postnatal depression were found in men.**


**The aim was to assess factors affecting transition to parenthood.**

- 294 first-time fathers (only 225 men completed at least 1 of the assessments).
- Participants completed a semi-structured interview to elicit demographic details at 26 weeks of their partner’s pregnancy and a number of self-report questionnaires that assessed their psychological status, the quality of their relationship, and the period of highest distress was at the first assessment in pregnancy and for most men, their anxiety decreased steadily postpartum.

Lower relationship satisfaction and gender role stress were associated with distress both antenatally and postpartum.
<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Participants</th>
<th>Methodology</th>
<th>Measures</th>
<th>Findings</th>
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<tr>
<td>Castle, H., Slade, P., Barranco-Wadlow, M., and Rogers, M. (2008)</td>
<td>United Kingdom</td>
<td>86 first-time mothers and 66 fathers</td>
<td>Participants were assessed in the 3rd trimester of pregnancy and at 6 weeks postpartum.</td>
<td>EPDS and the BDI short form were the measures of prenatal and postnatal distress completed by both men and women.</td>
<td>Distress found to affect the men’s attachment to their infants. During pregnancy, distressed men reported a significantly lower level of marital satisfaction, perceived lower care, and higher control by their partner. During pregnancy, distressed men had poorer relationship functioning, with poorer overall relationship quality and, continuing in the postnatal period, a greater feeling of being controlled by their partner.</td>
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<tr>
<td>Chien-Chung, H., and Warner, L. A. (2005)</td>
<td>USA</td>
<td>3,830 fathers (2,780 unmarried and 1,050 married) from the Fragile Families</td>
<td>Analysis of data at birth and 12 months postpartum.</td>
<td>CIDI-SF was used to screen for depression.</td>
<td>Men who were more positive attitudes towards emotional expression reported a higher perceived social support during pregnancy ($r = .30, p &lt; .05$), and also reported significantly lower levels of stress at six weeks postpartum. Perceptions of emotional support were decreased between pregnancy and the postpartum period.</td>
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</table>
and Child Wellbeing.

Depression: The Composite International Diagnostic Interview Short Form (CIDI-SF) and the CES-D were the measures of depression completed by the fathers. No cut-off scores were given. (CES-D: screening tool).

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The aim was twofold: (1) to estimate the prevalence of depression during pregnancy and 8 weeks after birth in fathers from different family structures and, (2) to explore the correlates of their depressive symptoms.

7,018 male partners of women (together with the women) in the Avon Longitudinal Study of Pregnancy and Childhood, a large representative community sample.

Fathers and mothers were assessed at 18 weeks gestation and then again 8 weeks post birth. Mothers also completed a questionnaire at 14 weeks gestation.

Fathers: at 18 weeks gestation completed a questionnaire including measures of depression, life events, social support, qualities of the partner relationship, and demographic information. At 8 weeks post birth, depression was measured again.

Mothers: at 14 weeks gestation, mothers completed a measure on socioeconomic status. At the other two time points they completed a depression measure.

Family structure. The mothers’ reports of household structure provided information on family structure and categorized men in the following family categories: traditional, stepfather, stepmother and single-mother.

Depression: The EPDS was the measure of depression completed by fathers and participants scoring ≥ 12 on the EPDS were considered depressed. (EPDS: screening tool).

Participants scoring ≥ 12 on the EPDS were considered depressed. (EPDS: screening tool).

There were 6,028 men in traditional families, 383 in stepfather and 39 in stepmother families, and 217 men had partners who were non-resident (single mothers).

Maternal and paternal depressive symptoms were significantly and positively correlated both before and after the birth (r = .26, p < .001).

Depressive symptoms were significantly lower for fathers in traditional families than both in stepfather and single mother families; this was the case during pregnancy and after the birth. Both during pregnancy and after the birth, men in step families had more than twice the rates of depressive symptoms than men in traditional families.

Correlates of higher levels of depressive symptoms in stepfathers.
mothers at each time point. included: less education, more significant life events ($r = .28$, $p < .001$), less social support ($r = -.22$, $p < .001$), a smaller number of social networks ($r = -.13$, $p < .001$), and more aggression in the partnership. Poor relationship with partner during pregnancy and in the postpartum was also found to be predictive of paternal depression postnatally ($r = .19$, $p < .001$).

| Johnson, M. P., and Baker, S. R. (2004) | 284 men (216 men’s partners had their child delivered and 68 men’s partner miscarried). | The aim was twofold: (1) to investigate if men’s coping response during pregnancy, at childbirth, or miscarriage predicted psychological outcomes during that period or 1 year postpartum, and (2) to determine if there were changes in the men’s coping repertoire. | Assessment was done in the beginning of the 2nd trimester of the men’s partners’ pregnancy, at childbirth or miscarriage, and 1 year postpartum or miscarriage. | Questionnaires included measures of stress, anxiety, coping and depression. Depression: The BDI was the measure of depression completed by the participants. The BDI was used to screen for depression. No cut-off scores were given. (BDI: screening tool). | Level of stress, anxiety and depression were the highest during childbirth or miscarriage (followed by pregnancy). Stress and anxiety fell to the lowest after 1 year postpartum. However, depression remained significantly high as compared to pregnancy even though the condition showed a decrease. Coping response at childbirth or miscarriage was the best long term predictor of psychological outcomes. Men relied more on approach-orientated coping during pregnancy and changed to avoidant-orientated coping during childbirth or miscarriage. |
| Leathers, S. J., Kelley, M. A., and Richman, J. A. (1997) | 108 primiparous couples. | The aim was to investigate the risk factors of social support from spouses ($r = -.58$, $p < .001$), low control (at work ($r = .51$, $p < .001$)) | Assessment was done in the 2nd trimester of pregnancy and the CES-D was used to screen for depressive symptoms. No cut-off scores were given. (CES-D: screening tool). | Questionnaires included measures of perception of control, perception of social support and depressive symptoms. Depression: The CES-D was the measure of depression completed by the participants. The CES-D was used to screen for depression. No cut-off scores were given. (CES-D: screening tool). | Low emotional support from spouses ($r = -.58$, $p < .001$), low control (at work ($r = .51$, $p < .001$)) |
The aim was to examine the role of personality and parental relationship as risk factors for postnatal depression in first-time mothers and fathers.

Participants were assessed antenatally (20–24 weeks gestation) and at 6, 12 and 52 weeks postpartum. Questionnaires included measures of mental health, partner support, quality of care received from their own parents, interpersonal sensitivity, and personality.

Depression: Fathers completed the BDI and GHQ-28 antenatally and at 12 months postpartum. Mothers completed the BDI antenatally and at 4 and 12 months postpartum, the EPDS at 6 weeks postpartum, and the GHQ-28 antenatally and at 12 months postpartum.

The EPDS (> 12), BDI (> 9) and GHQ (> 7) were used to screen for depression. (EPDS, BDI and GHQ: screening tools)

Men’s relationship with either his mother or father (having risk ratio of 4.0 and 3.8 respectively at six weeks postpartum) and his level of neuroticism ($\beta = 0.18, p < .01$) were associated with his mood level in the early postpartum stage.

By the end of the first year postpartum, couple comorbidity increased, with rates of distress being at their highest for both men and women.

Antenatal depression or distress predicted postnatal depression in both men and women.

Course of antenatal depression different for men and women.

For mothers and fathers who had psychopathologic symptoms antenatally, they experienced elevated levels of...
| Basel, Switzerland | depressive symptoms and stress and, (2) the differences between men and women in the course of depression and stress over time in regards to parental psychopathology and child difficulty. | and 18 months postpartum. | Depression: The German version of EPDS was the measure of depression completed by fathers and mothers at each time point. | Postnatal depressive symptoms lasting up to one year or longer. |

| Ramchandani, P. G., O’Connor, T. G., Evans, J., Heron, J., Murray, L., and Stein, A. (2008a) | The aim was to examine the associations between depression in men measured in the prenatal and postnatal periods and later behavioural and emotional and psychiatric problems in their child. | 13,228 men obtained from the Avon Longitudinal Study of Parents and Children (ALSPC). | Men were assessed in week 18 of their partners’ pregnancy and again at 8 weeks after the birth of their infant. | Participants scoring ≥ 12 on the EPDS were considered depressed. (EPDS: screening tool). |

| Bristol, UK | 13,228 men obtained from the Avon Longitudinal Study of Parents and Children (ALSPC). | The children were assessed at age 3.5 and 7 years old. | Questionnaires included a measure of depression. | Children of men who were depressed in both the antenatal and postpartum periods had the highest risks of subsequent psychopathology, which was measured by total problems at age 3 ½ years and psychiatric diagnosis at age 7 years. |

| | Questionnaires included measures of emotional and behavioural developmental disturbances via maternal reports at 3.5 years after birth. | | Children of men who were depressed in both the antenatal and postpartum periods had the highest risks of subsequent psychopathology, which was measured by total problems at age 3 ½ years and psychiatric diagnosis at age 7 years. |

| | At age 7, the Development and Well-Being Assessment (DAWBA) questionnaire was completed by parents (usually mothers) and teachers. | | No significant differences were found when antenatal and postnatal depression exposure were compared. |

| | Depression: The EPDS was the measure of depression completed by father at each time point. | | Compared to men who were not depressed, children of men who had only postnatal depression had higher rates of conduct problems at age 3 ½ years whereas children of men who had antenatal depression did not. |
Ramchandani, P. G., Stein, A., O'Connor, T. G., Heron, J., Murray, L., and Evans, J. (2008b) Bristol, UK

The aim was to investigate the relationship between postnatal depression in men and later psychiatric disorders in their children and also the predisposing factors for the postnatal depression.

10,975 men and their children obtain from the Avon Longitudinal Study of Parents and Children (ALSPC).

Men were assessed in week 18 of their partners' pregnancy and at 8 weeks, 8 months, and 21 months postpartum.

Their children were assessed at ages 6 years (81 months) and 7 years (91 months) by maternal and teacher report.

Questionnaires included measures of anxiety and depression.

Children: Questionnaires included measures of emotional and behavioural developmental disturbances via parental reports at 6 years (81 months) after birth.

At age 7, the Development and Well-Being Assessment (DAWBA) questionnaire was completed by parents (usually mothers) and teachers.

Depression: The EPDS was the measure of depression completed by father at each time point.

Participants scoring ≥ 12 on the EPDS were considered depressed. (EPDS: screening tool).

Postnatal depression in men was significantly associated with psychiatric disorder in their children 7 years later, particularly oppositional defiant/conduct disorders, after controlling for maternal depression and paternal educational level.

Having a history of severe depression (odds ratio = 6.07, \( p < .001 \)), and having high antenatal anxiety (odds ratio = 9.37, \( p < .001 \)) and depressive symptoms (odds ratio = 19.36, \( p < .001 \)) were the most significant predictors of postnatal depression in men.


The aim was to study the postpartum affective experiences of couples.

51 couples (26 expecting their first child and 25 expecting their second).

Participants were assessed one month pre- and then one month postpartum.

Questionnaires included measures of coping, marital satisfaction, stress, positive and negative affect, and depression.

Depression: The CES-D was the measure of depression completed by both parents at each time point.

Participants scoring > 16 on the CES-D were considered depressed. (CES-D: screening tool).

There was a significant correlation between depressive symptoms between the mothers and the fathers (\( r = .29, p < .05 \)).

Antenatal coping, parenting stress and affect significantly predicted postnatal depression in both men and women.

Parenting stress was also found to have negative implications for couples' functioning.
The fathers' parenting stress was also found to correlate significantly with all the variables measured in mothers, including positive affect ($r = .28$, $p < .05$), parenting stress ($r = .36$, $p < .05$), marital satisfaction ($r = .30$, $p < .05$), and depression ($r = .29$, $p < .05$).

The most common risk factors that were found to be associated prospectively with depression in men post birth were poor social support or perception of poor social support and low emotional support/perception of low emotional support (Boyce et al., 2007; Castle et al., 2008; Condon et al., 2004; Deater-Deckard et al., 1998; Leathers et al., 1997), neuroticism (Boyce et al., 2007; Condon et al., 2004; Matthey et al., 2000), increased adverse life events (Boyce et al., 2007; Condon et al., 2004; Deater-Deckard et al., 1998), having a poor relationship with partner or no romantic relationship (Boyce et al., 2007; Buist et al., 2003; Condon et al., 2004; Deater-Deckard et al., 1998), and the occurrence of depression in their partner (Areias et al., 1996; Deater-Deckard et al., 1998; Matthey et al., 2000; Soliday et al., 1999).

Other less common prospective risk factors that were found to be associated with paternal depression in the postpartum included having a lack of information/knowledge about pregnancy and childbirth and perception in pregnancy of a vast decline in the sexual relationship (Boyce et al., 2007; Condon et al., 2004), a man's relationship with either his mother or father (Matthey et al., 2000), gender role stress and a greater feeling of being controlled by one's partner (Buist et al., 2003), paternal anxiety and depression during pregnancy (Matthey et
al., 2000; Ramchandani et al., 2008b), history of severe depression (Ramchandani et al., 2008b), antenatal coping, parenting stress and affect (Soliday et al., 1999), low control at work and in the parenting role and low social gratification at work and in parenting (Leathers et al., 1997), and substance use at birth (Chien-Chung & Warner, 2005).

In addition to the prospective correlates noted above, Castle et al. (2008) showed that men's perceptions of emotional support decreased between pregnancy and the postpartum period. This decrease in the perceptions of emotional support may have been caused by a change in the way men appraised the two circumstances and viewed the postpartum period as more threatening. Castle et al. argued that perceived social support may, therefore, be protective for new fathers. The findings of Deater-Deckard et al.'s (1998) study also revealed that men in stepfamilies and those whose partners were single mothers had higher levels of depressive symptoms than men who were in traditional families before and after birth. Finally, coping responses or strategies were also found to be associated with depression in men during pregnancy and post birth. Johnson and Baker's (2004) findings revealed that the maladaptive coping response at childbirth or miscarriage was the best long term predictor of poor paternal psychological health outcomes like anxiety and depression.

**Discussion**

The current review identified correlates associated with paternal depression pre- and post-birth. According to the reviewed studies, having a depressed partner, poor quality relationship between the father and the mother, and low social support are the most common correlates of depression in men both during their
partners' pregnancy and in the postpartum period. Indeed, another theme that emerged in the studies reviewed suggest that there is a possible cumulative effect with an increase in depression in one partner possibly leading to an increase in depression in the other. This trend was revealed despite differences in the depression measurement tools used. That is, whereas Aries et al. (1996) used a clinical diagnostic tool to assess depression, screening tools were used by Deater-Deckard et al. (1998) (the EPDS) and Matthey et al. (2003; 2000) (the EPDS, the BDI and GHQ), and in each case partner's depression was found to be a potential risk factor for depression in men. The cause of this couple comorbidity has yet to be established; Deater-Deckard et al. (1998) suggested that each partner's psychosocial state directly influences the other partner's or that men and women who are vulnerable to depression are more likely to form relationships with each other.

The current review differs from other literature reviews that investigated depression in expectant and new fathers, in that the focus was on the postnatal and the antenatal period. To our knowledge, this is the first paper to systematically review the correlates and predictors of depression during the gestational and postpartum periods in men. Greater anger and anxiety, low positive and high negative affect during pregnancy (Buist et al., 2003), were found to be associated with depression post birth in men. Risk factors such as the lack of information about pregnancy and childbirth, poor social support (Boyce et al., 2007; Condon et al., 2004), gender role stress, greater feeling of being controlled by one's partner and poorer marital/partner relationships (Buist et al., 2003), were found to be predictive of paternal depression both pre- and post birth. Interestingly, while Boyce et al. (2007), Condon et al. (2004) and Matthey et al. (2000) found that
high levels of neuroticism were significant prospective correlates of paternal psychological distress, Bielawska-Batorowicz and Kossakowska-Petrycka's (2006) cross-sectional study indicated that neuroticism was not related to paternal depression. Evaluating potential risk factors for paternal depression pre- and post birth necessarily requires systematic investigation and this is best achieved using prospective longitudinal designs.

In addition, Boyce et al. (2007) and Condon et al. (2004) found that the transition into fatherhood corresponded with men's perception of a vast decline in the sexual relationship in terms of pleasure and the regularity of sexual activity. The preponderance of change usually occurred antenatally, with only a slight improvement by the end of the first postpartum year. These changes, their extent, and, in particular, their failure to recover, were unexpected by a large percentage (33% to 50%) of men in these studies.

The men in Boyce et al. (2007) and Condon et al.'s (2004) study also appeared ill-prepared for the impact of fatherhood on their lives, especially with regard to changes in their sexual relationships. Moreover, men who had insufficient information about pregnancy and childbirth were also at risk of being distressed; this was the case for some of the men in Boyce et al. and Condon et al.'s study. Fifty-two percent of the men in this study anticipated that they would be having more frequent intercourse after a year postpartum (presumably at pre-pregnancy levels); however, this did not happen in most cases. Being prepared and having sufficient information may help an individual cope with the transition to parenthood. In addition to having information and resources, the study by Boyce et al. and Condon et al. indicated that social support may also be a protective factor. That is, dissatisfaction with social support was also found to be
one of the main variables associated significantly with psychological distress in men during their partner's pregnancy in the study.

Boyce et al. (2007) and Condon et al. (2004) suggested that men may have lacked good role models for fathering as they had been raised in the era where men were less involved in the birth and child-rearing. They also found that the antenatal period was more stressful for men than the postnatal period. This might be due to the fact that some of the most important changes take place early in the pregnancy, such as coping with the change to a new lifestyle, change of social interactions, and preparing for parenthood. However, this finding contradicts the findings of Perren et al. (2005) who found that paternal depressive symptoms were highest in pregnancy and the first months postpartum, whereas feelings of psychosocial stress were highest one year after childbirth, particularly for fathers who had psychopathological symptoms antenatally. Such contradicting findings warrant further investigations. Knowing which period is most stressful for men can lead to new interventions being put in place to help men cope.

While depression during pregnancy was found to predict depression in men during the postpartum, the course of depression during pregnancy might be different for men and for women (Matthey et al., 2000). Initial analyses of the data from Matthey et al.’s study found only a small but significant relationship between depressive symptoms of men and women antenatally and in the postpartum. However, further analyses revealed that while the risk of depression in men and their partners was unrelated in the antenatal period, at 6 and 12 months postpartum there was a greater risk of depression in men whose partners were depressed. Additionally, risk factors for depression during the postpartum in men and women included antenatal mood and partner relationship. As noted by
Matthey et al., it may be that as a couple adjust to parenthood partner support becomes more salient and therefore has a greater impact on mood. This may explain the increased association between depression in men and women in the postpartum. Boyce et al. (2007) and Condon et al. (2004) also argued that there are gender specific risk factors for paternal depression during pregnancy that are either not present or operate to a lesser extent in women. Explanations for this gender difference included an under-reporting of depressive symptomatology by men, either due to a real difference in the experience of depression (Brems, 1995), poorer recall of symptoms by men (Wilhelm & Parker, 1994), or men having different symptoms than those assessed on diagnostic interviews or self-report measures (Wilhelm & Parker, 1993). The much greater rates of zero symptoms reported by the men compared with women in this study suggests that gender specific symptoms may be possible.

Finally, Ramchandani et al. (2008b) found that having a history of severe depression and having high antenatal anxiety and antenatal depression were the most significant predictors of depression in men postnatally. Ramchandani et al. were the first to report on anxiety during pregnancy as a risk factor of depression in men post birth, although this has been reported previously for women (e.g., Milgrom et al., 2008b; Skouteris, Wertheim, Rallis, Milgrom, & Paxton, 2009).

Several common limitations are evident in the studies reviewed. First, 11 of the 26 empirical studies reported on small sample sizes (ranging from 10 to 100 participants) (Areias et al., 1996; Bielawska-Batorowicz & Kossakowska-Petrycka, 2006; Bradley & Slade, 2011; Davé et al., 2005; Davey et al., 2006; Field et al., 2006; Kaplan, Sliter, & Burgess, 2007; Perren et al., 2005; Soliday et al., 1999; Wang & Chen, 2006; Zelkowitz & Milet, 1997). Using a small sample
limits the number of variables that can be investigated. This also potentially limits
the internal and external validity of the findings. Second, many of the studies used
cross-sectional designs (Bielawska-Batorowicz & Kossakowska-Petrycka, 2006;
Bradley & Slade, 2011; Bronte-Tinkew et al., 2007; Dudley et al., 2001; Field et
al., 2006; Gao et al., 2009; Kaplan et al., 2007; Matthey et al., 2003; Paulson et
al., 2006; Roberts et al., 2006; Zelkowitz & Milet, 1997). While interesting
correlational data have emerged from these studies, the cross-sectional design
does not permit directional and causal conclusions about variables to be made.
This, coupled with the limited number of longitudinal studies, which tend to use
small sample sizes, reduced the number of variables that could be investigated.
Third, the majority of studies reviewed were focused on identifying correlates or
risk factors of paternal depression post birth (Areias et al., 1996; Bielawska-
Batorowicz & Kossakowska-Petrycka, 2006; Boyce et al., 2007; Bronte-Tinkew
et al., 2007; Buist et al., 2003; Chien-Chung & Warner, 2005; Condon et al.,
2004; Davé et al., 2005; Davey et al., 2006; Dudley et al., 2001; Gao et al., 2009;
Leathers et al., 1997; Matthey et al., 2003; Matthey et al., 2000; Perren et al.,
2005; Pinheiro et al., 2006; Ramchandani et al., 2008a; Ramchandani et al.,
2008b; Roberts et al., 2006; Soliday et al., 1999; Wang & Chen, 2006; Zelkowitz
& Milet, 1997). Only four studies examined correlates or risk factors of
depression during pregnancy in men (Castle et al., 2008; Deater-Deckard et al.,
1998; Field et al., 2006; Johnson & Baker, 2004). Understanding the risk factors
of paternal depression during the antenatal period is just as important as
understanding the risk factors of paternal depression during the postpartum
period, especially given the prevalence of elevated depressive symptoms during
the time of pregnancy for men is as high as the prevalence of elevated depressive
symptoms post birth. Research with women (e.g., Milgrom et al., 2008b; Skouteris et al., 2009) has also suggested that the antenatal period is important for the development of postnatal depression; this might also be the case for men.

A further limitation is that the studies conducted through pregnancy had only one assessment point during gestation (e.g., Areias et al., 1996; Boyce et al., 2007; Condon et al., 2004; Deater-Deckard et al., 1998), and in the postpartum studies there were no more than three assessment points (e.g., Bielawska-Batorowicz & Kossakowska-Petrycka, 2006; Buist et al., 2003; Leathers et al., 1997). The limited number of assessments restricts the extent to which causal relationships between variables can be examined across time.

Finally, a range of different tools were used to screen for current depression in the reviewed studies. It is not possible to draw conclusions about risk factors for clinical depression when such screening tools are used because they measure depressive symptoms only; that is, they are not diagnostic measures of clinical depression. We used the term “depression” as did many researchers in their studies, despite measures assessing depressive symptoms being used. For example, while the aim of Bielawska-Batorowicz and Kossakowska-Petrycka's (2006) study was to investigate the prevalence and correlates of depression in men postnatally, the findings need to be interpreted with caution as the EPDS measures depressive symptoms only; whether or not clinical levels of depression were experienced by the mothers and fathers in Bielawska-Batorowicz and Kossakowska-Petrycka's study was not revealed by their data. Similarly, the GHQ, EPDS, HADS, CES-D and BDI were used in the reviewed studies. These measures also assess current depressive mood symptomatology and are not diagnostic tools (Bielawska-Batorowicz & Kossakowska-Petrycka, 2006; Boyce
et al., 2007; Buist et al., 2003; Castle et al., 2008; Condon et al., 2004; Davé et al., 2005; Deater-Deckard et al., 1998; Dudley et al., 2001; Field et al., 2006; Gao et al., 2009; Johnson & Baker, 2004; Leathers et al., 1997; Matthey et al., 2000; Perren et al., 2005; Pinheiro et al., 2006; Ramchandani et al., 2008a; Ramchandani et al., 2008b; Roberts et al., 2006; Soliday et al., 1999; Wang & Chen, 2006). Given different sample sizes and diagnostic instruments used and the limitations noted here, it is not surprising that the prevalence rates of depression during pregnancy in men varied widely across the studies reported here.

The use of the term “depression” when only levels of “depressive symptoms” were measured was also a limitation of many studies reviewed here (Bielawska-Batorowicz & Kossakowska-Petrycka, 2006; Davé et al., 2005; Dudley et al., 2001; Field et al., 2006; Gao et al., 2009; Johnson & Baker, 2004; Leathers et al., 1997; Matthey et al., 2000; Pinheiro et al., 2006; Ramchandani et al., 2008a; Ramchandani et al., 2008b; Wang & Chen, 2006); this limitation, coupled with the limitation of insufficient assessment time points through pregnancy and the postpartum is problematic as it may imply that paternal distress is enduring, yet the distress may indeed be transient (Matthey, 2010). This methodological issue is addressed by Matthey (2010) in a very recent paper, where he asks the question, are we overpathologising motherhood (and potentially fatherhood)? Matthey raised concerns about the use of self-report mood scales to estimate probable rates of perinatal depression in women (and men). He argued that in research published to date “many women (and possibly men) are being incorrectly identified as having clinically significant distress, or have risks that predict they may develop this level of distress” (p. 264). The findings of our
review accord with Matthey’s concerns. It is therefore, recommended that in future research, a distinction be made between clinical depression and current depressive symptomatology, and that the results be explicitly referred to only in the context of the time frame in which depression was examined (e.g. pregnancy or postpartum; transient or enduring distress). Furthermore, it may be that differential predictors of transient depressive symptoms and clinical depression can be distinguished, which would further improve our understanding of the development of depression during pregnancy and the postpartum in men and potentially assist clinicians to provide targeted interventions. Despite the methodological limitations however, our findings highlight the importance of relationship factors to depressive symptoms in men, not just during the postnatal period, but during pregnancy as well.

Finally, in searching for articles, only papers that were in English were selected. Due to this, important studies might have been overlooked that would otherwise inform our current knowledge of depression in men around pregnancy and in the postpartum. There is also the possibility publication bias where studies with null findings are less likely to be published.

In conclusion, to date most studies have only explored uni-dimensional associations between potential correlates and/or risk factors for elevated depressive symptoms in men during pregnancy and the postpartum. Therefore, a complete model of the development of depressive conditions in men during the ante- and postnatal periods, which is multifactorial and inclusive of bio-psycho-social variables, is needed (Ross et al., 2004). Previous research has been informative but has also been limited in terms of theory building. Hence, a more rigorous and systematic investigation of direct and indirect (mediators and
predictors of depressive symptoms in fathers pre- and post birth is warranted. Future research needs to extend the work conducted to date by adopting prospective longitudinal designs, increasing the time points of assessment through pregnancy and the postpartum to ensure the measurement of variables is more systematic and rigorous, and ensuring a suitable sample size to be able to assess both the direct and mediating / moderating effects of potential risk factors.

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**Conflict of interest**

There is no conflict of interest.
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Ramchandani, P. G., Stein, A., O'Connor, T. G., Heron, J., Murray, L., & Evans, J. (2008b). Depression in men in the postnatal period and later child


Chapter 3

Fathers’ mental health in during the ante- and postnatal periods:

Knowledge, recommendations and interventions

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Abstract

This paper discusses what we know about paternal depression during the perinatal period and if there are any effective interventions for it. Available prevalence estimates suggest that depression experienced by men perinatally may be elevated and specific and/or related to this significant life stage. Currently, there is a paucity of research evaluating how depression during the perinatal period manifests differently in men than women and if men cope with their depression in ways different to women. There is also a lack of studies comparing the risk factors of paternal depression during the perinatal period and the risk factors for general depression in men. Studies showed that paternal perinatal depression not only affects the men, but their children as well. On reviewing the studies on interventions, it is clear that further randomised controlled trials (RCTs) of interventions are needed to establish efficacious and cost-effective treatment protocols for men.
While there are a number of reports of depressive symptoms in men during the pre- and post-birth periods (Eberhard-Gran, Tambs, Opjordsmoen, Skrondal, & Eskild, 2003; Fletcher et al., 2006; Matthey et al., 2003; Munk-Olsen, Laursen, Pedersen, Mors, & Mortensen, 2006), it is not clear whether the prevalence of depression for men is increased during these significant life stages; whether depression during the pre- and post-birth periods differs from depression experienced by men generally; and whether depression associated with childbirth for men has distinctive clinical features that differ from those experienced by women. Furthermore, while there is preliminary evidence of poor outcomes for infants whose fathers are depressed, the full impact of a father’s poor mental health has yet to be determined (Eberhard-Gran et al., 2003; Hendrick, Altshuler, Strouse, & Grosser, 2000; Munk-Olsen et al., 2006). An important and related issue is whether prevention and treatment programmes for paternal depression during the ante- and postnatal periods are effective and whether improvement in depression leads to improved outcomes for offspring. Hence, this paper reviews what the current literature reveals about:

- the prevalence of depression in men during the perinatal period
- whether depression at this time for men is similar to depression experienced by women
- the risk factors of paternal depression during the perinatal period compared with risk factors for depression at other times
- the effects of depression in men during pregnancy and post-birth on child development
the effectiveness of intervention programmes targeting prevention and/or treatment for men experiencing depression during the perinatal period.

The literature reviewed in the next four sections was sourced from the reference lists of three recent systematic reviews of perinatal depression (Fisher et al., 2012; Hanson, Hunter, Bormann, & Sobo, 2009; Wee et al., 2011) and two recent meta-analyses (Kane & Garber, 2004; Paulson & Bazemore, 2010a); and the publication databases of the Australian Bureau of Statistics (ABS) and Growing Up in Australia: The Longitudinal Study of Australian Children (LSAC). The literature has not been reviewed systematically because previous systematic reviews have been conducted (Wee et al., 2011). This paper synthesises the information from several recent reviews and databases to address its overall aim. In contrast, for the last section pertaining to the prevention and treatment of depression in men perinatally, a systematic review was conducted because, to the authors’ knowledge, this literature has never been reviewed previously.

Prevalence of depression in fathers during the perinatal period

The reported prevalence rates for paternal depression during the perinatal period are very variable across studies. A recent meta-analysis of depression during this period in 28,004 fathers, across 43 studies in a range of high-income countries, reported an overall rate of paternal depression between the first trimester and 1 year postpartum as 10.4% (Paulson & Bazemore, 2010a), significantly higher than that reported among men in the general US population of approximately 4.8% (Kessler et al., 2003a) or the Australian estimate of 3.1%
(Australian Bureau of Statistics (ABS), 2007). The prevalence rates in the meta-analysis may be an overestimate, as the depression was determined largely by questionnaire cut-off scores, rather than more conservative diagnostic interviews (Paulson & Bazemore, 2010a; Paulson & Bazemore, 2010b) such as the Composite International Diagnostic Interview (CIDI) (Kessler & Ustun, 2004) used by the Australian Bureau of Statistics and the study conducted by Kessler et al (Kessler et al., 2003a).

Based on data collected from Australian fathers with children aged 0–5 years (n=3471) in the LSAC, Giallo et al (2012) reported that, during the first year post-birth, 18.4% (accrued prevalence rate of 3 to 12 months post-birth) of fathers were depressed and fathers with infants were 1.38 times more likely to be psychologically distressed compared to the general Australian adult male population—all males, fathers and not, aged 18 to 85; data from the 2007 Australian National Survey of Mental Health and Wellbeing (NSMHWB) (ABS, 2007). These results should be interpreted cautiously as the Kessler 6 (K6) scale (Kessler et al., 2003b), which is a quantifier of non-specific psychological distress, was the only measure used in Giallo et al.’s study, whereas data from the NSMHWB were collected using the World Mental Health Survey Initiative version of the CIDI (Kessler & Ustun, 2004).

Other estimates of paternal depression using self-report tools to assess symptoms of depression are also higher than population estimates. For example, Madsen and Juhl (2007) reported that 5% of their sample of 549 fathers were depressed when the Edinburgh Postnatal Depression Scale (EPDS) was used, and 3.4% indicated depression when the Gotland Male Depression Scale (GMDS) was used (6.5%, 34 of 524, were depressed when both measures were used).
Overall, available prevalence estimates suggest that depression experienced by men perinatally may be elevated and related to this significant life stage. It also appears that the prevalence rate of depression in men during the perinatal period is more pronounced in low-income countries/communities than high income countries/communities (Tran, Tran, & Fisher, 2012), though the reasons for this difference are yet to be determined for men. There is, however, a strong body of evidence (Abiodun, 2006; Aderibigbe, Gureje, & Omigbodun, 1993; Fisher et al., 2012) covering known factors (e.g., poverty, and chronic social adversity like family violence) for the more pronounced prevalence rate of depression in women in low-income countries during the perinatal period. These factors could also be associated with the elevated prevalence rate of depression in men in low-income countries. Further research adopting clinical interviews (to differentiate between depressive episode and symptoms) and taking into account place of residence, is needed in order to estimate the prevalence of clinically significant depression in men during the ante- and postnatal periods.

**The manifestation of perinatal depressive symptoms in men and women**

Irrespective of the prevalence, there is a paucity of research related to the experience of depression in fathers. What remains unclear is whether there are any differences between paternal and maternal depression experienced during the perinatal periods. Madsen (2011), after interviewing 150 fathers, suggested that some symptoms of depression during the perinatal period (e.g., deep feeling of abandonment and powerlessness) experienced by the sexes are similar; however, symptoms such as outbursts of anger, alcohol and substance abuse, may be more frequently manifested in men.
Another differential gender-based risk factor in the postnatal period was found by Wang and Chen (2006). They showed that depressive outcomes post-birth were associated with high levels of perceived stress in women and with low self-esteem in men, and noted that fathers tended to under-report depressive symptoms. They suggested that this may be due to either a real difference in the experience of depression, poorer recall of symptoms by men, or because men’s depressive symptoms are different than those specified in diagnostic interviews or self-report measures. This would seem to be the only study to show an association between depression post-birth and low self-esteem in men, albeit other studies unrelated to childbirth, have previously reported this association (e.g., Ormel, Oldehinkel, & Vollebergh, 2004; Shahar & Davidson, 2003). However, it is important to note that Wang and Chen’s study is cross-sectional — observing one specific point in time — and, therefore, the direction of the relationships between variables should not be inferred. Further research is needed to confirm that this association is also robust for the perinatal period.

Other studies, unrelated to childbirth, have also indicated that depression manifests differently in men than women (Brownhill, Wilhelm, Barclay, & Parker, 2002; Grigoriadis & Robinson, 2007; Winkler, Pjrek, & Kasper, 2006) and that men cope with their depression differently (Brownhill et al., 2002; Veskrna, 2010). For example, men in general may be reluctant to disclose emotional difficulties and restrict emotions (Gaylin, 2000; Heifner, 1997) and have a negative attitude towards seeking help (Good & Mintz, 1990; Good & Wood, 1995) due to cultural expectations. With a small sample of 14 men clinically diagnosed with depression, Heifner (1997) found, through interviews, that the male gender role identity affected the expectations that men had about
depression. These men reported that they needed to be strong, successful, in control, capable of handling their own problems without help, and that they needed to conceal emotions. Similarly, Good and Mintz’s (1990) study with 401 male university students showed that men who identified more closely with the cultural expectations of the male role were more likely to have depression and were less inclined to seek counselling services. These findings suggest that such cultural expectations of the male role could place men at an increased risk of depression during the perinatal period. The perinatal period presents parents with unique pressures, such as perceived expectations to be a ‘good parent’, dramatic changes in lifestyle, relationship changes, financial pressures and sleep deprivation. It is possible that men who are expecting or have recently fathered a child, may identify strongly with gender role expectations to provide financially for their family and this may lead to increased psychological stress. Future research is needed to examine this assumption empirically.

**Risk factors of paternal depression during the perinatal period versus risk factors for depression at other times**

So why might men more frequently become depressed during their partner’s pregnancy and post-birth than at other times in their lives? Limited research is available, but Condon (2006) suggested that men can experience their partner’s pregnancy and the birth of a new baby as a stressful time filled with new challenges and adjustment to routines. These stressful changes can lead to depression for men in similar ways that it does for some women (Solantaus & Salo, 2005).
A systematic review of the literature performed for the PREDICT study (King et al., 2006)—an international study to address this risk estimation of depression—identified a list of 39 common risk factors for general depression in men and women, such as anxiety, sexual and emotional relationships with partners, and adequacy of social support from family and friends. These risk factors are similar to those found by a recent systematic review of the literature on cross-sectional and prospective correlates of depressive symptoms in men during the perinatal period by Wee et al (2011). However, the effects of these risk factors may be different for depression in men in general and specifically in perinatal depression. For instance, having a non-professional occupation and living alone has the most significant impact on men’s depression in general (Stegenga et al., 2012), whereas having a partner who is depressed is consistently found to have a moderate association with depression in men during the perinatal period (Paulson & Bazemore, 2010a; Paulson et al., 2006). Further research is needed to investigate whether similar risk factors, that are listed in both the PREDICT study (King et al., 2006) and the systematic review by Wee et al (2011) have different effects on general depression and paternal perinatal depression. It can be speculated that factors such as the elevated stress that comes with living with and caring for a spouse who is mentally ill, in addition to stresses that come with the arrival of a newborn can lead to a higher risk for depression in men during the perinatal period.

The importance of relationship factors during the perinatal period and other life stages have been shown by numerous studies (e.g., Boyce et al., 2007; Buist et al., 2003; Condon et al., 2004; Deater-Deckard et al., 1998). The pressures and practicalities of parenting can often lead to substantial changes in
the intimate relationship. Condon et al.’s (2004) study of first-time fathers found that distress in men during the antenatal period was associated closely with a perceived poor marital relationship. They also found that transition into fatherhood corresponded with a perception of a ‘vast decline’ in the sexual relationship. The reported preponderance of change in intimate relationships occurred prenatally with only a slight improvement by the end of the first postpartum year. These changes, their extent, and, in particular, their failure to recover, were unexpected by a large percentage of men in Condon et al.’s study. However, caution does need to be exercised when reviewing these results as couples seeking to conceive would usually have a higher frequency of intercourse; and thus, to describe a ‘vast decline’ in sexual relationship in the perinatal period might not be an accurate comparison. However, we currently do not have information about whether it is an actual or perceived report of a decline in frequency of intercourse or what has been measured. Also, intimacy is not all about sexual relationship — it is a dimension of trust, safety and, most importantly, the giving and receiving of affection. Cox et al (1989) found that couples, irrespective of their individual psychological adjustment, who were in a close relationship, characterised by warmth and affection before the birth of their child, would generally make adjustments into parenthood more readily. It is possible that couples who have a good relationship would not view that their intimate relationship has been altered even with a decline in sexual intercourse as other dimensions of their intimate relationship, like trust and affection, might not have decreased. Therefore, other aspects of intimate relationships need to be explored including the possibility of changed levels of affection by men, which could potentially increase or decrease at this time. Nevertheless, the reduction in
the frequency of sexual intercourse in the postpartum period could be a source of
intimacy might not only be a source of distress, but may also be a symptom of
depression (loss of libido), as with reduced motivation and fatigue (APA, 2000),
and this may also have contributed to the reported reduced sexual activity. In the
context of these relationship changes, men may be reluctant to express their
depressive and related symptoms due to concern about their partner’s needs or
fear of ridicule, given the typical emphasis given to the needs of mother and child
(Meighan, Davis, Thomas, & Droppleman, 1999).

The interplay between depression, anxiety and stress is also important.
Anxiety and stress have been found to co-exist frequently with depression in
pregnancy and in the postpartum in men (Figueiredo & Conde, 2011; Gao et al.,
2009; Johnson & Baker, 2004; Matthey et al., 2003; Moss, Skouteris, Wertheim,
Paxton, & Milgrom, 2009; Skouteris et al., 2009; Wang & Chen, 2006). Forsyth
et al’s (2011) study of the experiences of 48 Australian men with pregnant
partners found that more than half expressed worries about their partner’s pain,
the possibility that their baby might have an abnormality and not being able to
provide financially for their family. Similarly, a review by Hanson et al (2009)
found that fathers frequently expressed fear for the safety of the mother and child,
anxiety and fear about observing their partner in pain, feelings of helplessness,
lack of knowledge about the birthing process, and concerns about risks of
interventions such as operative delivery, limited finances and parenting skills.
These factors contributing to anxiety and stress are specific to the perinatal period
as opposed to other life stages (Wolitzky-Taylor, Castriotta, Lenze, Stanley, &
Craske, 2010).
Though several studies have found anxiety to frequently co-exist with depression pre- and post-birth in men (e.g., Buist et al., 2003; Johnson & Baker, 2004; Matthey et al., 2003), there is only one study to date (Ramchandani et al., 2008a) to have shown an association between anxiety experienced by men during their partner’s pregnancy and depression after the birth of the child. In fact, Ramchandani et al (2008a) found that having high anxiety and depressive symptoms during pregnancy were the most significant predictors of depression in men in the postpartum period. This reflects the research with women which also identifies a strong correlation between antenatal anxiety and postnatal depression (Milgrom et al., 2008b; Skouteris et al., 2009).

Identifying the risk factors for depression in men during the perinatal period, and having a better understanding of what roles anxiety and stress play in causing depression may help differentiate perinatal depression from depression in men generally. This may in turn answer whether manifestation of depression in men during the perinatal periods is different to other times. Additionally, comparing risk factors for men and women (Milgrom et al., 2008b) during the perinatal period may inform interventions aimed at the couple.

Depression in men during pregnancy and post-birth, and child development

Paternal depression pre- and post-birth has been found to have a detrimental effect not only on a couple’s relationship but on the parent-child relationship and on children’s development (Deater-Deckard et al., 1998; Fletcher, Feeman, Garfield, & Vimpani, 2011; Kane & Garber, 2004; Paulson et al., 2006; Paulson, Keefe, & Leiferman, 2009; Ramchandani et al., 2005; Ramchandani et al., 2008a; Ramchandani et al., 2011; Ramchandani et al., 2011;
2008b). For example, children of fathers who reported depressive symptoms 8 weeks after the birth of their child were found to have more than double the rate of emotional and behavioural problems as their peers at age 3.5 years (Ramchandani et al., 2005). The same children were found to have higher levels of psychiatric disorder 7 years later, compared to children whose fathers did not report depression following the birth of the child, even after controlling for maternal depression and paternal educational level (Ramchandani et al., 2008a). This study is part of the Avon Longitudinal Study of Parents and Children (ALSPAC). Participants, when their partners were due to deliver their baby between 1 April 1991 and 31 December 1992, were recruited around the Bristol area of the UK (every pregnant woman in the county of Avon was eligible to participate). Data were taken from 10,975 men and 8,401 children. In another study, Fletcher et al (2011) found that paternal depression post-birth was associated with gender-specific effects. They found that paternal depression was associated with hyperactivity in boys and emotional problems in girls 4 to 5 years after birth. This is an Australian study, with the sample of 2620 drawn from the Longitudinal Study of Australian Children (LSAC). The total LSAC population is around 10,000 children who were recruited in different age bands. The researchers recruited from the cohort of children aged 3–19 months at the first wave of data collection (2004), 2–3 years old at the second wave (2006), and 4–5 years old in the third wave (2008). In order to ensure a similar level of exposure to paternal presence, the researchers limited their sample to two-biological-parent families that were still intact 4 years after the initial wave of data collection (n=2620). However, the mechanisms behind the effects of depression in men on their children’s development are unclear.
Paulson et al’s (2006) study of 5089 two-parent families examined the impact of depressed parents’ interactions with their child (at 9 months postpartum). While the greatest association between depressed affect and interaction with one’s child was found for women, depression in fathers was related to a reduced likelihood of playing with their child outside and of the mother regularly telling stories to their child. In a subsequent study, Paulson et al.’s (2009) study of 4109 fathers discovered that paternal, but not maternal, depression (measured at 9 months postpartum) was associated with a reduction in children’s expressive language development at 2 years of age. It was argued that because fathers tend to spend less time engaging in reading activities with their children, a further decrease in time spent reading to their children may significantly affect their children’s language development. These studies showed that paternal perinatal depression not only affects the men, but their children as well. Therefore, it is vital that intervention programmes are in place to help perinatally depressed fathers and their families cope. This is especially important in low-income countries or communities where depression is more prevalent (Tran et al., 2012). The likelihood of parents in these communities having literacy difficulties is also higher, thus further exacerbating the reduction in children’s expressive language development.

**Prevention and treatment of depression in men**

There is sufficient evidence that a proportion of men suffer depression during the pre- and post-birth periods and that such depressive affect may have significant detrimental effects. Evaluating the effectiveness of intervention programmes for men experiencing depression pre- or post-birth, is warranted.
Due to unawareness of a review of this literature, a review was undertaken here. A search of Academic Search Complete, CINAHL with Full Text, Health Source: Nursing/Academic Edition, MEDLINE, Psychology and Behavioral Sciences Collection, and PsycINFO databases, where papers were limited to English language papers published between January 1900 and July 2012, revealed that there were only four such studies (Feinberg & Kan, 2008; Hynd, Skeffington, & Cooke, 2007; Salonen, Kaunonen, Astedt-Kurki, Jarvenpaa, & Tarkka, 2008; Thome & Skuladottir, 2005) (Figure 1). The search terms used were:

- antenatal, pregnan*, perinatal, postnatal, postpartum, childbearing, child-bearing, childbirth or afterbirth
- depress*, distress or anxiety
- women, woman, mother*, mum* or parent*
- men, man, father* or dad*
- screening, treatment, program* or intervention*.
**Figure 1: Flow chart diagram for literature search.**

- Records identified through database searching (n = 397)
- Additional records identified through search via Google (n = 3)

  Records after duplicates removed (n = 307)

  Records excluded (n = 127)
  - Studies did not focus on depression, stress or anxiety during pregnancy or the postpartum or fathers were not the main target of the interventions

  Records screened (n = 145)
  - Full-text articles assessed for eligibility (n = 18)

  Full-text articles excluded, with reasons (n = 14)
  - Did not include men as part of the invention, but as a moderator for reducing symptoms, n = 2
  - Did not include men as part of the invention, only for focus group, n = 2
  - Protocol paper, n = 1
  - Review paper, n = 1
  - Qualitative paper, n = 2
  - Descriptive paper, n = 2
  - Other, n = 4

  Studies included in qualitative synthesis and review (n = 4)
The four studies demonstrated very variable outcomes: one reported on significance in the reduction of depressive symptoms in mothers and not in fathers even though the symptoms were measured in both parents (Hynd et al., 2007); one reported a significant decrease in depressive symptoms in both mothers and fathers (Thome & Skuladottir, 2005); one reported a non-significant decrease in both mothers and fathers (Salonen et al., 2008); and one had a significant decrease in depressive symptoms in the mothers but not in fathers (Feinberg & Kan, 2008). Of the four studies, two used family therapy (Feinberg & Kan, 2008; Thome & Skuladottir, 2005) one used group psychotherapy (Hynd et al., 2007) and one did not describe the type of psychotherapy used (Salonen et al., 2008). Given the mixed outcomes of the interventions, it is not possible to identify which type of psychotherapy is effective for the treatment of perinatal depression in men.

It is notable that no studies to date have examined the efficacy of treatment of perinatal depression in men using Cognitive Behavioural Therapy (CBT). While the Australian Clinical Guidelines recommend the use of CBT for the treatment of postnatal depression in women based on evidence of effectiveness, there are no such specific recommendations for men (beyondblue, 2011; Dennis & Hodnett, 2007).

The studies reviewed had limitations. First, three of the four studies did not use a randomized controlled design (Hynd et al., 2007; Salonen et al., 2008; Thome & Skuladottir, 2005), making it unclear whether the results were due to treatment effects, occurred by chance or factors other than the intervention (e.g. individuals who show improvements due to their child sleeping better as they grow older/mature). Secondly, there was a recruitment bias, with three of the four
studies (Hynd et al., 2007; Salonen et al., 2008; Thome & Skuladottir, 2005) using a sample of convenience, limiting the generalisability of the findings. Thirdly, there was a problem with imprecision. One of the four studies had few measurement time points (1 and 4 respectively; see Table 1) in their interventions (Thome & Skuladottir, 2005) and one of the four studies did not specify a fixed assessment time point in their intervention programme (Salonen et al., 2008). With only four studies on interventions for treating paternal depression during the ante- or postnatal periods, it is not possible to draw any conclusive findings or recommendations.
Table 1. Interventions designed to prevent depression, anxiety and/or stress in fathers and mothers and/or fathers only

<table>
<thead>
<tr>
<th>Study and Research Aims/ Questions</th>
<th>Theories/ Underlying Principles</th>
<th>Sample Mean age (SD) / Design</th>
<th>Delivery of Intervention</th>
<th>Time Points of Interventions</th>
<th>Measures Used for data collection</th>
<th>Findings/ Outcomes</th>
</tr>
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<tbody>
<tr>
<td>Feinberg &amp; Kan, 2008, USA</td>
<td>Theory/ Principle: Based on the Internal structure and ecological context of coparenting (Feinberg, 2003)</td>
<td>Participants: Resided in rural areas, towns, and small cities. 82% of couples were married, and 91% of mothers and 90% of fathers were non-Hispanic White. The remaining participants were African American, Asian, Hispanic, or other ethnicity</td>
<td>A series of 8 classes, delivered before and after birth to the treatment group</td>
<td>8 classes between 22 weeks gestation to 6 months after birth</td>
<td>Coparenting: A scale developed by the researchers.</td>
<td>Intervention effects on depression and anxiety in fathers were not significant. Intervention effects on depression and anxiety in mothers were significant (B = -.195, p &lt; .01, effect size = 0.56; and B = -.1218, p &lt; .05, effect size = 0.38 respectively)</td>
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<tr>
<td>Hynd, Skoffington, &amp; Cooke, 2007, Western Australia</td>
<td>Theory/ Principle: None specified</td>
<td>Participants: Parents experiencing postnatal stress and depression and recruited from Armadale Community Health Service or the Gosnells Women’s Health Service</td>
<td>2.5 hour group sessions</td>
<td>A 9 week intervention program to treat PND</td>
<td>Mothers attended all 9 sessions</td>
<td>Mothers: There was a significant decrease in EDPS scores from pre-test to post-test 1 (t (34) = 5.38; p &lt; .001) and between pre-test and post-test 2 (t (39) = 6.51; p &lt; .001). There was also a significant decrease in DSI scores from pre-test to post-test 1 (t (39) = 4.745; p &lt; .001) and between pre-test and post-test 2 (t (39) = 5.38; p &lt; .001).</td>
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<td>communicatio...</td>
<td>Intervention N = 62 (26 from Armadale and 37 Gosnells); Control N = 0. Mean age (SD): Not given. Median age for both groups was 25-29 years. Design: quasi-experimental with only an experimental group to whom the intervention was delivered. attended three 2.5 hour sessions during weeks one, five and nine</td>
<td>Jones, &amp; Rappaport, 1987), and the Family Adaptability and Cohesion Scale II (FACES II) (Olson, Portner, &amp; Lavac, 1993). Mothers completed the Edinburgh Postnatal Depression Scale (EPDS) (Cox et al., 1987), the Self Esteem Questionnaire (SEQ) (Sorensen, 1998) and the Social Support Scale (SSS) (Macdonald, 1998), in addition to the questionnaire s that were completed by fathers.</td>
<td>test 2 (t(136) = 4.970; p &lt; .001) Fathers: There was no significant effect of the intervention on depressive symptoms and anxiety.</td>
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<td>Salonen, Kaunonen, Astedt-Kurki, Jarvenpaa, &amp; Tarkka, 2008 Finland To describe the development of an internet-based intervention that provided preventively-oriented support and information for new mothers and fathers and to compare the participants and hospitals at baseline</td>
<td>Theory/Principle: Parent–Child Interaction Model (Barnard, 1994) Participants: Recruited from 2 public university hospitals to represent families in a variety of life situations in urban and suburban areas in southern Finland Sample Size: Intervention N = 469 mothers and 307 fathers; Control N = 394 mothers and 218 fathers. Mean age (SD): Intervention: mothers = 30.7 (5.0); fathers = 32.0 (5.8) Control: mothers = 29.8 (5.2); fathers = 31.8 (5.3). Design: quasi-</td>
<td>Online intervention in the treatment hospital Website focused on 6 themes: (1) for mothers; (2) for fathers; (3) for infant; (4) life as a couple and family; (5) what to do when parents are in trouble and (6) support for the family Not specified</td>
<td>Depressive symptoms: EPDS (Cox et al., 1987) Other questionnaire s were also used to measures parent, infant and environmenta l attributes No significant differences between the intervention group and the control group in regards to depressive symptoms</td>
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Thome & Skuladottir, 2005
Iceland
To evaluate the effectiveness of a family-centred intervention for sleep problems of infants in relation to parents’ distress

Note: Distress was measured by the following: (1) fatigue and resulting symptom distress; (2) Parenting Stress (3) anxiety; and (4) depressive symptoms

<table>
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<tr>
<th>Theory/Principle:</th>
<th>Participants:</th>
<th>Fatigue and symptom distress:</th>
<th>Parental stress, depressive symptoms, state anxiety symptom distress and fatigue all decreased significantly 2 months after the intervention in both parents</th>
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<td>behaviourist and social learning theory (Leeson, Barbour, Romanuk, &amp; Warr, 1994; Messer &amp; Parker, 1998; Minde et al., 1993) and psychoanalytic theory (Daws, 1989)</td>
<td>Parents whose infants were hospitalized due to sleep problems Reykjavik, Iceland</td>
<td>Intervention N = 33 mothers and 30 fathers; Control N = 0. Mean age (SD): mothers = 30.0 (5.3); fathers = 32.7 (6.4).</td>
<td>T-test of data before and after intervention: Mothers: Parenting stress p &lt; 0.001; Depressive symptoms p &lt; 0.001; State anxiety p &lt; 0.05; Symptom distress p &lt; 0.001; Fatigue p &lt; 0.001</td>
</tr>
<tr>
<td>Design: quasi-experimental with only an experimental group to whom the intervention was delivered.</td>
<td>Face to face sessions with paediatric nurses</td>
<td>2 to 4 hours face to face sessions with a paediatric nurse for each night of the 4 nights their infant was in hospital.</td>
<td>Fathers: Parenting stress p &lt; 0.05; Depressive symptoms p &lt; 0.05; State anxiety p &lt; 0.05; Symptom distress p &lt; 0.001; Fatigue p &lt; 0.001</td>
</tr>
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</table>

\(^{i}\)No additional information, other than to whom these six themes were focused on, was given.

\(^{ii}\)No definition of “in trouble” was given by the researchers.
In order to design effective treatment programmes for men suffering from depression during the perinatal periods, a much better understanding of whether paternal perinatal depression is significantly different from depression at any other life stages is needed. It is necessary to establish whether there are differences between the manifestation of paternal depression during the perinatal period and depression in men at other life stages. Further research is also needed to identify the contributing factors of depression, anxiety and stress that may be unique to the perinatal period to assist in the development of effective programmes.

Conclusion

There is a paucity of research examining the prevalence, nature and risk factors of paternal depression perinatally using diagnostic measures and tools specific for men. It is also clear that further RCTs of interventions are needed to establish efficacious and cost-effective treatment protocols for these men, particularly as paternal depression appears to contribute negatively to child development. It is interesting to note that all the interventions reviewed are treatment programmes and not preventive programmes. It is important to consider that men are less likely to present for mental health treatment (e.g., Mansfield, Addis, & Mahalik, 2003; Moller-Leimkuhler, 2001), suggesting that it is important to reduce the stigma associated with paternal depression and to have preventive programmes in place. For example, Veskrna (2010) suggested that educating men about their masculine gender socialisation and its potential impact on behavioural and affective symptoms may be useful as a preventive measure. Similarly, promoting help-seeking behaviour as a way to improve occupational
outcomes or the health of one’s partner or child may be useful for men who perceive their depression as a sign of weakness (O’Brien, Hunt, & Hart, 2005; Veskrna, 2010).

**Key points**

- Further research is needed in order to estimate the prevalence of clinically significant depression in men during the ante- and postnatal periods
- Given the pressures uniquely associated with the perinatal period, it is possible that men who are expecting, or have recently fathered a child, may identify strongly with gender role expectations to provide financially for their family and this may lead to increased psychological stress
- Identifying the risk factors for depression in men during the perinatal period, and having a better understanding of what roles anxiety and stress play in causing depression may help us differentiate perinatal depression from depression in men generally
- Studies showed that paternal perinatal depression not only affects the men, but their children as well
- In order to design effective treatment programmes for men suffering from depression during the perinatal periods, we need a better understanding whether paternal perinatal depression is significantly different from depression at any other life stages
References


Chapter 4 – Update to the Systematic Review (Wee et al., 2011)

An update to the systematic review (Wee et al., 2011)

Since Wee et al.’s (2011) paper, a systematic review (Bradley & Slade, 2011) and an integrated review (Edward, Castle, Mills, Davis, & Casey, 2015) have been published. Bradley and Slade (2011), in an attempt to investigate mental health issues in fathers in the first year postpartum, reviewed 39 articles, 21 of which focused on depression in fathers during the postpartum period. Their review revealed that during the first six weeks after-birth, 1 to 8% of fathers were depressed, and between 5 to 6% of fathers were depressed at 3 to 6 months postpartum. Risk factors identified were similar to those found in Wee et al.’s (2011) review, and included neuroticism, depression in men during the antenatal period, having other psychological problems (like high levels of anxiety), experiencing stressful life events, having low confidence about coping, parenting stress, parenting style of their own parents, personality, immature defence style (coping strategies), experiences of the birth, socio-economic and demographic factors (e.g., being less than 30 years of age; having low education), partner’s depression, poor quality of relationship with their partner, low social support, and their opinion of their baby (viewing their baby’s behaviours as less positive or having the view that their baby’s traits were below their expectations prior to the birth). The findings of their review also revealed that paternal depressive symptoms impact on fathers’ interactions with their children, their partners’ interactions with their children and their children’s behaviour. This is also consistent with what was found in the systematic review by Wee et al. (2011).
Edward et al.’s (2015) integrated review reviewed 63 articles in an attempt to investigate postnatal depression in fathers and to present potential screening and referral options. The review revealed that the risk factors for postnatal depression in fathers were similar to those found in Wee et al.’s (2011) and Bradley and Slade’s (2011) reviews. This included depression with having an unsupportive relationship, being unemployed, a personal history of depression and/or anxiety, maternal depression during pregnancy, older age, low levels of marital satisfaction, financial/life stressors, a feeling of incongruity between expectations of parenthood and the realities, lack of outside social supports for parenting, poor social functioning, dissatisfaction with partner support, poor communication between the parents, gender of the child for some cultures, adaptation impaired paternal/newborn bonding, and/or feelings of exclusion from maternal/newborn bonding. Of these risk factors, partner’s depression and personal history of depression were found to be the strongest predictor of paternal postnatal depression. Edward et al. also found that fathers and mothers had different knowledge and beliefs about the symptoms and causes of postnatal depression. Most women attributed postnatal depression to biological rather than psychosocial causes. Similar to what was found in Wee et al.’s review, Edward et al.’s integrated review also revealed that paternal postnatal depression can have a detrimental effect on the relationship between men and their partners, between the parent and child, and also has a negative effect on children’s development.

Given that it has been four years since Wee et al.’s (2011) systematic review was published, and that there have been no other systematic reviews published on depression in men during both the ante- and postnatal period, an update of the systematic review (Wee et al., 2011) was undertaken. Articles for
the updated review were sourced from the same databases and using the same search terms and criteria that were outlined in the first review paper (see Chapter 2). The search was for articles published between September 2009 and April 2015 (the search for articles ended August 2009 in the first review paper).

The search yielded 3369 articles and the Abstracts were read to assess suitability. Studies were excluded as per exclusion criteria specified in the first review paper. This resulted in 54 articles, all of which were read in their entirety. A further 43 studies were rejected because they included one of the exclusion criteria, leaving 11 articles that were relevant for the current review. Of the 11 empirical papers, five adopted a cross-sectional design that focused on paternal depression during the postpartum (Bergström, 2013; Cockshaw, Muscat, Obst, & Thorpe, 2014; Mao et al., 2011; Nishimura & Ohashi, 2010; Serhan et al., 2013). The remaining six studies were longitudinal in design; one assessed participants antenatally (Skjothaug, Smith, Wentzel-Larsen, & Moe, 2015); three assessed participants antenatally and during the postpartum period (Gawlik et al., 2014; Hanington, Heron, Stein, & Ramchandani, 2012; Ngai & Ngu, 2015), and the other two assessed participants in the postpartum period only (Don & Mickelson, 2012; Roubinov, Luecken, Cnic, & Gonzales, 2014).

Cross-sectional studies

Details of the main aim, sample, design, methodology and findings of the five cross-sectional studies are summarised in Table 1 below.
<table>
<thead>
<tr>
<th>Authors and country of study</th>
<th>Main aim/research questions</th>
<th>Sample</th>
<th>Design</th>
<th>Methodology (including measures used)</th>
<th>Criteria used to define depression</th>
<th>Main findings</th>
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<tbody>
<tr>
<td>Bergström, M. (2013) Sweden</td>
<td>The aim was to explore the associations of paternal age, socio-demographic characteristic, and antenatal psychological well-being with depressive symptoms in Swedish first-time fathers.</td>
<td>812 first time fathers who participated in antenatal education classes during the partner’s pregnancy.</td>
<td>Men completed questionnaires 3 months post-birth.</td>
<td>Depressive Symptoms: The Edinburgh Postnatal Depression Scale (EPDS) (Cox et al., 1987) was completed by the men.</td>
<td>Participants scoring ≥ 11 on the EPDS were considered depressed. (EPDS: screening tool).</td>
<td>10.3% of the men experienced depressive symptoms. Younger men were (Aged less than 29yrs) more likely to be at risk of suffering from depressive symptoms than older men. Low education, low income, poor relationship quality with partner, and financial concern were identified as risk factors as well.</td>
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<tr>
<td>Cockshaw, W. D., Muscat, T., Obst, P. L., &amp; Thorpe, K. (2014) Brisbane, Australia</td>
<td>The aim was to examine the relationships between infant behaviours, parenting belief systems and early paternal postnatal depression</td>
<td>219 Fathers recruited through mothers of infants aged 0 to 24 weeks (median 7 weeks) at general medical practices and child health clinics in Brisbane, Australia.</td>
<td>Questionnaires were distributed when participants were attending postnatal clinics at hospitals and community based clinics (exact time point not reported). Questionnaires were returned through reply-paid postage.</td>
<td>Measures were adapted from the Avon Longitudinal Study of Parents and Children (ALSPAC). All measures were completed by fathers except infant temperament, for which both parents’ report are used. Depressive Symptoms: EPDS was used to measure depression</td>
<td>No criteria were defined for the EPDS. Negative life events and infant feeding problems were associated significantly with depression in men. The relationship between negative life events and infant feeding problems were not moderated by the father’s regulation beliefs.</td>
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<tr>
<td>Author(s)</td>
<td>Location</td>
<td>Aim</td>
<td>Participants</td>
<td>Methods</td>
<td>Findings</td>
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<tr>
<td>Mao, Q., Zhu, L. x., &amp; Su, X. y.</td>
<td>Fujian Province, China</td>
<td>The aim was to examine the differences in the prevalence of depression and its risk factors between new mothers and fathers post-birth.</td>
<td>Participants completed questionnaires at 6-8 weeks post-birth when they attended their postnatal health check-ups at the hospitals.</td>
<td>The EPDS, the Perceived Stress Scale (Cohen, Kamarck, &amp; Mermelstein, 1983) and the Social Support Rating Scale (Xiao &amp; Yang, 1987) were used to measure depression, perceived stress and social support respectively</td>
<td>12.5% of men were depressed. No significant differences in prevalence found between men and their partners. Men also had similar stress levels as their partners. Perceived stress, low social support and partner’s depression were associated significantly with depression in men. Men’s depression was also associated significantly with their preference for a male baby.</td>
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<tr>
<td>Nishimura, A., &amp; Ohashi, K.</td>
<td>Japan</td>
<td>The aim was to explore risk factors of depression in fathers at 4 weeks post-birth.</td>
<td>Participants were given questionnaires at their 1 month postpartum health check-ups at the hospitals. Questionnaires were returned within a week.</td>
<td>The CES-D (Radloff, 1977) and the EPDS were used to assess depression in fathers and mothers.</td>
<td>No significant association was found between paternal and maternal depression. A cut-off of ≥ 16 on the CES-D were found to be depressed. Depression in men was found to be associated with employment status, history of psychiatric treatment, and unintended pregnancy.</td>
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<tr>
<td>Serhan, N., Ege, E., Ayrancı,</td>
<td>Turkey</td>
<td>The aim was to examine whether participants scoring ≥ 13 on the EPDS were considered depressed.</td>
<td>Participants scoring ≥ 13 on the EPDS were used to assess depression in fathers and mothers.</td>
<td>A cut-off of ≥ 8 and ≥ 9 on the EPDS were used for the fathers and mothers respectively.</td>
<td>1.8% of the fathers were depressed.</td>
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the prevalence of depression and its risk factors between mothers and fathers post-birth. Health centre in western Turkey.

Mean age (SD) = 31.9 years (5.02) for fathers and 28.61 years (4.89) for mothers. 47.3% of the mothers and 73.6% of the fathers had a tertiary education.

Income: Not reported.

Comparing these studies to the studies reviewed by Wee et al. (2011) and Bradley and Slade (2011), there were similarities in the correlates found across all studies conducted to date. Correlates such as paternal age (men who were younger than 30 years of age), low education, low income, poor relationship quality with partner, financial concern (Bergström, 2013), employment status (Nishimura & Ohashi, 2010; Serhan et al., 2013), partner’s depression, perceived stress, social support (Mao et al., 2011), history of psychiatric treatment (Nishimura & Ohashi, 2010), and experiencing negative life events (Cockshaw et al., 2014), were found to be consistent with the risk factors found in Bradley and Slade’s review and Wee et al.’s review.

Interestingly, several contradictions were revealed when comparing the correlates found in the new reviewed studies to correlates found in the studies reviewed by Bradley and Slade (2011) and Wee et al. (2011). Nishimura and Ohashi (2010) found that paternal and maternal depression were not associated significantly; the reason for this finding remains unclear. However, given that Nishimura and Ohashi’s study was a cross-sectional, it is possible that an association between paternal and maternal depression emerges, as suggested by
numerous studies (e.g., Areias et al., 1996; Bradley & Slade, 2011; Deater-Deckard et al., 1998; Matthey et al., 2000; Soliday et al., 1999), after the 4th week postpartum.

Serhan et al. (2013) also found that paternal and maternal depression were not significantly associated. Additionally, they found that low education and low income were not associated significantly with paternal depression. Again, this latter finding contradicts the findings of Bradley and Slade’s (2011) review and Wee et al.’s (2011) review.

Three new correlates were found in the updated review: a preference for a male baby (Mao et al., 2011), an unintended pregnancy (Nishimura & Ohashi, 2010) and infant feeding problems (Cockshaw et al., 2014). The preference for a male baby and its association with depression in men post-birth might have had a cultural connection in China with its one child policy (Westley & Choe, 2007). Similarly, the correlate of an unintended pregnancy may be culturally driven in Japan. The relationship between infant feeding problems and paternal depression could be explained by fathers feeling a sense of helplessness for being unable to provide direct instrumental support, and thus feel excluded (Mitchell-Box & Braun, 2012). Fathers would often view themselves as the main source of support for their partner and would feel responsible for sharing the childcare load (Boyce et al., 2007; Cockshaw et al., 2014); therefore, the incongruence between the father’s ability to participate and his perception of the ideal father role might exacerbate his levels of depressive symptoms.

There are two significant methodological limitations of the five studies above: 1) the use of cross-sectional designs and 2) the focus on depression during the postpartum period only. Cross-sectional studies do not permit causal
relationships to be tested. Likewise, the focus on just the postpartum period is limiting.

Longitudinal studies

Six of the 11 empirical studies were longitudinal in design. One assessed participants antenatally (Skjothaug et al., 2015); three assessed participants antenatally and during the postpartum period (Gawlik et al., 2014; Hanington et al., 2012; Ngai & Ngu, 2015), and the other two assessed participants in the postpartum period only (Don & Mickelson, 2012; Roubinov et al., 2014). Details of the main aim, sample, design, methodology and findings of these studies are presented in Table 2 below.

Table 2. Summary of Longitudinal Studies through the Antenatal and Postpartum Periods

<table>
<thead>
<tr>
<th>Authors and country of study</th>
<th>Main aim/research questions</th>
<th>Sample</th>
<th>Design</th>
<th>Methodology (including measures used)</th>
<th>Criteria used to define depression</th>
<th>Main findings</th>
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<tbody>
<tr>
<td>Don, B. P., &amp; Mickelson, K. D. (2012) USA</td>
<td>The aim was to explore how spousal support and relationship satisfaction affected the association between maternal and paternal postpartum depression.</td>
<td>92 heterosexual couples from a year-long longitudinal study called Baby Transitions in Marital Exchanges (aka Baby T.I.M.E.). Mean age = 29.99 years for fathers and 28.06 years for mothers. SD for both parents not reported. 75% of participants had a tertiary education. 72.2% of participants had a household income of USD$60,000 or more per annum.</td>
<td>Assessments were done at 1 and 9 months postpartum.</td>
<td>Depressive symptoms: a shortened version of the Postpartum Depression Screening Scale (PDSS; Beck &amp; Gable, 2000). Both men and their partners also completed measures of positive spousal support, perceived negative spousal interactions, and relationship satisfaction.</td>
<td>No criteria were defined.</td>
<td>Relationship satisfaction and perceived spousal support decreased over time. Negative spousal interaction increased over time. Depression in both men and women was highest soon after birth and decreased over time. Levels of depression were significantly different between 1 and 9 months postpartum. Women reported significantly higher levels of depression than...</td>
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</table>

The aim was to provide an estimate of the prevalence of paternal perinatal depression in a German community sample and to explore the link between paternal perinatal depression and partnership satisfaction, birth-related concerns and concerns about the future. 102 German-speaking fathers. Mean age = 35.8 years (SD = 6).

Assessment was done between the second and third trimester, and at 3-4 weeks postpartum. Depressive symptoms: Participants completed the German version of the EPDS. Anxiety: 20-item state subscale of the Spielberger State/trait anxiety inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970).

Birth and future concerns: Study purpose constructed questionnaire.

Scores ≥ 9 on the EPDS were to identify probable cases of minor and major depression in fathers. Participants scoring ≥ 48 on the STAI were considered to have high anxiety levels (STAI; screening tool).

The prevalence of elevated depressive symptoms among fathers was 9.8 % antenatally and 7.8 % postnatally. Antenatal relationship quality, antenatal depressive symptoms, and birth concerns were significantly associated with and explained 47 % of the variance in paternal depressive symptoms in the postpartum period.

Analyses showed no significant differences between EPDS scores of first-time and non-first-time fathers. No significant differences were also found between fathers with and without an academic profession.

Hanington, L., Heron, J., Stein, A., & Ramchandani, P. (2012) UK

The aim was to investigate the effects of marital conflict on the association between 14 541 couples obtain from the Avon Longitudinal Study of Parents and Children (ALSPC).

Assessment was done during the second trimester and at 8 months postpartum. Parents completed the EPDS and a marital conflict scale (the scale was developed by the participants scoring ≥ 13 on the EPDS were considered depressed.

Prevalence rate of ante- and postnatal depression were significantly higher in mothers than in fathers. At Time
Postnatal parental depression and adverse child outcomes.

Demographic details of both mothers and fathers were not reported. Child outcomes were assessed at 42 months. Researchers for the purposes of the ALSPAC study).

Child outcomes were assessed using the Rutter revised pre-school scales (Elander & Rutter, 1996).

Point 1, 13.8% of the mothers and 4% of the fathers were depressed. At Time Point 2, 8.8% of the mothers and 2.9% of the fathers were depressed. Both fathers and mothers reported significantly higher levels of marital conflict postpartum than they did before the birth of their child.

Marital conflict partially mediated the relationship between postnatal depression in both men and their partners and child outcomes. Marital conflict was also found to be an independent risk for adverse child outcomes.

Both maternal and paternal depression and marital conflict in the antenatal period were both associated with adverse child effects which persisted after partial out postnatal depression and marital conflict.

Ngai, F.-W., & Ngu, S.-F. (2015) Hong Kong The aim was to examine 1) the association of prenatal family sense of coherence, stress, social support and family, and marital functioning, with postnatal depression in mothers and fathers; 2) the effects caused by any

<table>
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<tr>
<th>Fathers: prevalence rates of depressive symptoms were 7.0% (n=14) during pregnancy and 10.5% (n=21) and at 6 months postpartum.</th>
<th>Mothers: prevalence rates of depressive symptoms were 15.5% (n = 31) during pregnancy and</th>
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<td>Mean age of the couples = 33.4 years (SD = 4.6).</td>
<td>Participants also completed measures of sense of coherence in the family,</td>
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<td>A convenience sample of 200 childbearing couples attending the antenatal clinic of a regional hospital.</td>
<td>Depressive symptoms/psychological distress: General Health Questionnaire (GHQ; Goldberg, 1978).</td>
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<tr>
<td>Assessment was done during pregnancy (actual time period not reported) and at 6 months postpartum.</td>
<td>Participants scoring ≥ 4/5 on the GHQ were considered depressed. (GHQ: screening tool).</td>
</tr>
<tr>
<td>Participants scoring ≥ 4/5 on the GHQ were considered depressed. (GHQ: screening tool).</td>
<td>Participants also completed measures of sense of coherence in the family,</td>
</tr>
<tr>
<td>84% of couples were expecting their 1st child.</td>
<td>Fathers: prevalence rates of depressive symptoms were 7.0% (n=14) during pregnancy and 10.5% (n=21) and at 6 months postpartum.</td>
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changes in these factors from pregnancy to postpartum; and 3) the association between maternal and paternal depressive symptoms at 6 months postpartum.

99.8% of participants had at least a secondary level of education. Median household income = HK$34,699 (US$4,449) per month. Social readjustment, support network and the availability of social support, and satisfaction with family life and overall happiness with family life and marital functioning.

11.5% (n = 23) and at 6 months postpartum. Prevalence of depressive symptoms was significantly higher in mothers than fathers ($\chi^2 = 6.4$, $p < .05$) during pregnancy. No significant difference in the prevalence of depressive symptoms between mothers and fathers at 6 months postpartum.

Low levels of family sense of coherence, a high level of antenatal depressive symptoms, and partner's depressive symptoms were significantly associated with an increase in depressive symptoms for both mothers and fathers at 6 months postpartum. Low levels of social support was significantly associated with increased levels of depressive symptoms for mothers, but not for fathers.


The aim was to explore the prevalence and predictors of postnatal depression among low-income Mexican American men.

92 self-identified Mexican American men (low income) whose partners were part of a larger study of maternal and infant health (no details of this large study reported). Mean age = 31.3 years ($SD$ = 7.5).

15.2% of participants had

Assessment was done at 15 and 21 weeks postpartum (via telephone interviews).

Depressive symptoms: The EPDS was completed by the fathers at both 15 and 21 postpartum.

Enculturation/acculturation: At the 15 week postpartum, fathers completed the Acculturation Rating Scale for Mexican Participants scoring $\geq 10$ on the EPDS were considered depressed.

9% of fathers (n = 8) were depressed at both the 15 and 21 weeks postpartum.

Analyses revealed that unemployment status, having fewer biological children, poor marital relationship quality, and lower orientation to Anglo culture predicted higher.
87% of participants had a household income of USD $40,000 or less per annum.

Marital relationship quality and fathers' employment status were reported by the mothers.

Marital relationship quality and fathers' employment status were reported by the mothers.

No significant association was found between paternal and maternal depression.

No significant association was found between paternal and maternal depression.

The aim was to examine: 1) the association between adverse childhood experiences and pregnancy-related anxiety and depression in men during pregnancy; and 2) if this association varies across pregnancy.

The EPDS was completed by the participants at T2-T5.

Pregnancy-Related Anxiety: The short version of the Pregnancy-Related Anxiety Questionnaire (PRAQ; Van den Bergh, 1990) was completed by the participants at T2-T5.

Depressive symptoms: The EPDS was completed by the participants at T2-T5.

No criteria were defined.

Analyses showed significant associations between adverse childhood experiences, pregnancy-related anxiety and depression in men across pregnancy. Specifically, fathers who had more adverse childhood experiences, reported more pregnancy-related anxiety as compared to fathers who had fewer adverse childhood experiences at all time points in pregnancy, except at T5, while also reporting more depressive symptoms across pregnancy.

Four of the six longitudinal studies (Don & Mickelson, 2012; Hanington et al., 2012; Ngai & Ngu, 2015; Roubinov et al., 2014) compared data between fathers and mothers, but only three of these studies (Don & Mickelson, 2012; Hanington et al., 2012; Ngai & Ngu, 2015) reported on prevalence rates of
depression in both genders. Overall, these three studies found that depression in mothers was significantly higher than in fathers. This is consistent with the studies reviewed by Bradley and Slade (2011) and Wee et al. (2011). These three studies also revealed that maternal and paternal depression were significantly associated. Furthermore, this association was found to be mediated partially by positive spousal support and relationship satisfaction (Don & Mickelson, 2012) and marital conflict (Hanington et al., 2012). No significant association was found between paternal and maternal depression in Roubinov et al.’s (2014) study.

Comparing these studies (Don & Mickelson, 2012; Gawlik et al., 2014; Hanington et al., 2012; Ngai & Ngu, 2015; Roubinov et al., 2014; Skjothaug et al., 2015) with the studies reviewed by Bradley and Slade (2011) and Wee et al. (2011), there were similarities in the risk factors for paternal postnatal depression found across all studies conducted to date. These included poor marital relationship quality (Don & Mickelson, 2012; Gawlik et al., 2014; Roubinov et al., 2014), antenatal depressive symptoms (Gawlik et al., 2014; Ngai & Ngu, 2015), depression in partner (Ngai & Ngu, 2015), unemployment status (Roubinov et al., 2014), and concerns about the birthing process (Gawlik et al., 2014).

While reviewing these studies, new risk factors for paternal postnatal depression were also found; these include: low levels of family sense of coherence (Ngai & Ngu, 2015), having fewer biological children, and lower orientation to the Anglo culture (for Mexican American men) (Roubinov et al., 2014). Ngai and Ngu (2015) argued that parents with a strong family sense of coherence are more prone to experience a sense of certainty, stability and meaningfulness in the family, view the stresses of parenthood as challenges, and
are more driven to use coping resources and seek support when facing the stresses of new parenthood, which in turn increase their overall psychological well-being and decrease the risk of postnatal depression. Similar to the findings of Wee et al.’s (2011) systematic review, Roubinov et al. (2014) found that the lack of knowledge/experience would increase distress. Roubinov et al. argued that fathers with fewer biological children have less experiences and knowledge about the challenges that a newborn brings and therefore are less prepared for these challenges, which in turn increase their risk of distress.

As mentioned above, only one of the studies assessed participants antenatally (Skjothaug et al., 2015). Skjothaug et al. found that adverse childhood experiences were associated significantly with antenatal anxiety and depression in fathers.

Similar to one of the limitations identified by Wee et al.’s (2011) systematic review, five of the above studies (Don & Mickelson, 2012; Gawlik et al., 2014; Hanington et al., 2012; Ngai & Ngu, 2015; Roubinov et al., 2014) had very limited assessment points (all these five studies had only two assessment points). Only Skjothaug et al.’s (2015) study had a total of five assessment time points.

Summary

The update to the first published systematic review revealed 11 new articles; of these, five adopted a cross-sectional design that focused on paternal depression during the postpartum, and six studies were longitudinal in design. These 11 studies revealed very similar risk factors of paternal perinatal depression as those found in Wee et al.’s (2011) systematic review, with little focus placed
on the antenatal period. The limitations of these studies were also similar to those found in Wee et al. (2011).
References


The Little in Norway Study (LIN-study) (2010). *A longitudinal population study of infant vulnerability and plasticity from pregnancy to age 18 months (2010).* The research Council of Norway: Project No. 196156.


Chapter 5 – Update to the Review of Wee et al. (2013), and Evaluating the Effectiveness of Interventions

This chapter presents: (1) an update to the review presented in Chapter 3, and (2) the findings of the evaluation of the effectiveness of current intervention programs that were designed specifically for men who were suffering from depression during the perinatal period. The evaluation was done using the grading and recommendations assessment, development and evaluation (GRADE) approach (Brożek et al., 2009; Guyatt et al., 2011).

Background

In Wee et al. (2011) and Wee et al. (2013) presented in Chapter 2 and 3 respectively, the discussion about how depression during pregnancy and after birth affects not only mothers, but fathers as well, and how this can have detrimental effects on a couple’s relationship, the parent-child relationship, and on children’s development have been presented. While we do not fully comprehend the development of depression in men during the perinatal period or the risk factors that are associated with it, we do know, from prevalence rates for depression in men during this period, that paternal depression during the perinatal period does not happen by chance and is not confined to certain cultures or territories (Paulson & Bazemore, 2010a; Wee et al., 2013; Wee et al., 2011).

Additionally, anxiety and stress are often comorbid with depression in pregnancy and in the postpartum (Gao et al., 2009; Johnson & Baker, 2004; Matthey et al., 2003; Soliday et al., 1999; Thome & Arnardottir, 2013; Thome & Skuladottir, 2005; Wang & Chen, 2006) and these psychological states have been found to be risk factors for the development of depression (Gao et al., 2009;
Ramchandani et al., 2008b; Roberts et al., 2006; Wang & Chen, 2006). Matthey et al. (2003) argued that not addressing anxiety and stress through pregnancy and the postpartum may leave both fathers and mothers vulnerable to depression. Therefore, there is a need to identify and evaluate the effectiveness of interventions for reducing depression and the related factors, anxiety and stress. Current interventions designed to assist with depression during pregnancy and after birth, and/or anxiety and stress, have focused primarily on women (Rowe, Holton, & Fisher, 2013; Vogel, 2011).

Update to the systematic review on intervention

To my knowledge, the second review paper published here (Wee et al., 2013) was the only study that systematically identified and reviewed intervention studies, published between January 2000 and July 2012, that focused on fathers exclusively or on both fathers and mothers. This review was informed by the PRISMA statement (Moher et al., 2009). No other papers, according to my knowledge, have since been published on this subject matter.

Given that it has been two years since Wee et al.‘s (2013) review was published, and that there have been no other reviews published on studies investigating the effects of interventions designed to prevent or treat depressive symptoms, and/or anxiety and stress, in fathers only or in both fathers and mothers during the perinatal period, an update of Wee et al.‘s (2013) review was undertaken. Articles for the updated review were sourced from the same list of databases and using the same search terms and criteria that were outlined in Wee et al. (2013) (see Chapter 3). The search was for articles published between
August 2012 and April 2015 (the search for articles ended July 2012 in the second systematic review).

The search yielded 183 articles and the Abstracts were read to assess suitability. Studies were excluded as per exclusion criteria specified in Wee et al. (2013) (see Chapter 3). This resulted in 2 articles, both of which were read in their entirety. One study was further rejected because the fathers were not included as part of the invention, but as a moderator for reducing symptoms in the mothers, leaving only one article (Thome & Arnardottir, 2013) that was relevant for the current review.

Thome and Arnardottir (2013) aimed to assess the effects of an antenatal family nursing intervention for distressed men and their partners on depressive symptoms, anxiety, self-esteem, and dyadic adjustment. Thirty-nine expectant mothers (Mean age = 27 years; SD = 5.1), and their partners (Mean age = 30 years; SD = 5.6), attending antenatal care at community health centres in Iceland who were found to be distressed by midwives were recruited. The theory underlining their intervention was based on the Calgary Family Nursing Assessment and Intervention Model (Wright, 2005; Wright & Leahey, 2005; Wright, Watson, & Bell, 1996), and the design of the intervention was quasi-experimental that had a lack of random assignment of study participants and had only an experimental group to whom the intervention was delivered. The intervention, for mothers, was in the form of four weekly or monthly home visits by a nurse depending on the starting point of the intervention in the second or third trimester. During the home visits, the nurse would pose questions that were supposed to promote mutual cooperation between the family and the nurse, and to facilitate change or adjustment to a health problem. During the first and last visit,
the fathers were included in the conversations with the nurse. The inclusion of fathers in the discussion was meant to help couples to discern new ways of seeing a problem, to accept differences between partner’s views, and to find solutions to problems. Measures that were used for data collection were the Edinburgh Postnatal Depression Scale EPDS (Cox et al., 1987), the State-Anxiety Inventory (STAI) (Spielberger, 1983), the Rosenberg’s Self-esteem Scale (RSES) (Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995) and the Adjustment Scale (DAS) (Spanier, 1976). Analysis showed that the men and women differed significantly on all the measures, except the DAS, before the intervention (EPDS: \( t_{(50)} = 9.51, p < .001 \); STAI-trait: \( t_{(48)} = 2.93, p < .005 \); STAI-state: \( t_{(49)} = 5.95, p < .001 \); RSES: \( t_{(49)} = -4.37, p < .001 \) and DAS: \( t_{(39)} = -.71, p < .47 \). Analysis also showed that there was a significant difference in couples’ depressive symptoms (\( \chi^2 = 30.4, p < .001 \)), Trait and State anxiety (\( \chi^2 = 43.65, p < .001 \) and \( \chi^2 = 13.38, p < .001 \) respectively), self-esteem (\( \chi^2 = 17.02, p < .001 \)), and the quality of dyadic adjustment (\( \chi^2 = 16.17, p < .001 \)) after the intervention. Further analysis revealed significant improvement, in both mothers and fathers, on all indicators after the intervention; couples’ improvement was interrelated with regard to depressive symptoms, State anxiety, and the quality of dyadic adjustment (statistics not reported by Thome and Arnardottir). Education and household income details of the participants were not reported.

**Data analysis using the grading and recommendations assessment, development and evaluation (GRADE) approach**

In order to evaluate the effectiveness of the interventions, reported in the Wee et al.’s (2013) review presented in Chapter 3 and the additional study found
in the above review update, for reducing depression, anxiety and stress, or risk factors for them, the GRADE approach (Brożek et al., 2009; Guyatt et al., 2011) was used. A total of five studies were evaluated.

According to the GRADE approach (Brożek et al., 2009; Guyatt et al., 2011), the overall quality of the evidence of the relevant studies was assessed using five key factors which decrease quality of evidence: *limitations* (risk of bias), *inconsistency*, *indirectness*, *imprecision* and *publication bias*, as well as three factors that increase quality of evidence: *large magnitude of effect*, *plausible confounding* and *dose-response gradient* (see Table 1).

**Table 1. Definitions of GRADE quality of evidence key areas (Brożek et al., 2009; Guyatt et al., 2011)**

<table>
<thead>
<tr>
<th>Key areas</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factors which can decrease quality of evidence</strong></td>
<td></td>
</tr>
<tr>
<td>Limitations of design</td>
<td>Any risk of biases such as selection bias and measurement bias as well as inappropriate handling of confounding factors and attrition</td>
</tr>
<tr>
<td>Inconsistency</td>
<td>Any inconsistent results pertaining to associations across studies, suggesting differences in cause-effect relationships. These differences may arise as a result of populations, risk factors and outcomes. Depending on the magnitude of the discrepancy between results will result in quality of evidence being downgraded 1 or 2 points.</td>
</tr>
<tr>
<td>Indirectness</td>
<td>When the question being addressed by the authors</td>
</tr>
</tbody>
</table>
of a systematic review is different from the available evidence. This can be in regards to population, risk factor or outcome.

<table>
<thead>
<tr>
<th>Imprecision</th>
<th>This occurs when results of studies include few participants, resulting in wide CI’s around the estimate of effect.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication bias</td>
<td>The understatement or overstatement of the underlying effect, be it beneficial or harmful, due to selective publication of studies. This results by the investigators who fail to report studies where, typically, there is no effect.</td>
</tr>
</tbody>
</table>

| Large magnitude of effect    | A result of methodologically strong studies, a very large and consistent magnitude of association may be yielded, that is; the larger the effect, the stronger the evidence. |
| Factors which increase quality of evidence | Plausible confounding Plausible biases result in underestimating the associate effect. That is, the exposure effect may be larger than the data suggests. |
| Dose-response gradient       | When a situation is presented in which all plausible biases would decrease the magnitude of the effect. |

There are four judgements to the overall quality of the evidence of studies using the GRADE approach: high, moderate, low and very low. Starting with a
total of four points, a point is deducted for each of the factors found which can
decrease quality of evidence. A point is added for each of the factors found which
increase quality of evidence.

Reduction of depressive symptoms

Interestingly, of the five studies that measured depressive symptoms, one
only reported findings in mothers and not in fathers even though depressive
symptoms were measured in both parents (Hynd et al., 2007). Hynd et al. found a
significant decrease in depressive symptoms, from pre-test (first session of the
intervention) to post-test 1 (end of the nine weeks intervention) and between pre-
test and post-test 2 (three months post intervention), in the mothers. Two reported
a significant decrease in depressive symptoms in both mothers and fathers
(Thome & Arnardottir, 2013; Thome & Skuladottir, 2005); one reported a non-
significant decrease in both mothers and fathers (Salonen et al., 2008); and one
had a significant decrease in depressive symptoms in the mothers and not in
fathers (Feinberg & Kan, 2008). It is also interesting to note that the studies
(Feinberg & Kan, 2008; Hynd et al., 2007; Thome & Arnardottir, 2013; Thome &
Skuladottir, 2005) that reported a significant reduction in depressive symptoms in
one or both of the parents had relatively small sample sizes (ranged between 62 to
169) compared to the study (Salonen et al., 2008) that had a large sample (1388)
size that reported a non-significant finding in both parents.

The measures of depressive symptoms used varied across the studies and
this might have influenced the results. For example, the Edinburgh Postnatal
Depression Scale (EPDS) has been found to have a positive predictive value of
approximately 60 per cent (Milgrom, Mendelsohn, & Gemmill, 2011) but is not a
diagnostic tool. Given the limitations in design (not all RCTs) (-1), the inconsistency of findings reported (-1), imprecision (particularly small sample sizes in three studies (Hynd et al., 2007; Thome & Arnardottir, 2013; Thome & Skuladottir, 2005)) (-1), and publication bias (failure to report findings in one of the studies (Hynd et al., 2007)) (-1), the quality of evidence, according to the GRADE guidelines, for the reduction of depressive symptoms is very low.

Reduction of anxiety

Of the five studies, only three measured anxiety (Feinberg & Kan, 2008; Thome & Arnardottir, 2013; Thome & Skuladottir, 2005). Interestingly, the two studies that reported a significant decrease in depressive symptoms in both mothers and fathers (Thome & Arnardottir, 2013; Thome & Skuladottir, 2005), also reported a significant decrease in anxiety in both mothers and fathers. Also, the study that reported a significant decrease of depressive symptoms in the mothers and not in fathers (Feinberg & Kan, 2008), reported a significant decrease in anxiety in the mothers and not in fathers. As reported in the above, these studies had relatively small sample sizes. Given the limitations in design (not all RCTs) (-1), the inconsistency of findings reported (-1), and imprecision (small sample size) (-1), the overall quality of evidence for the reduction of anxiety is very low.

Reduction of stress

Of the five studies, only two measured stress (Hynd et al., 2007; Thome & Skuladottir, 2005) (see Table 1 in Chapter 3). However, the types of stress measured were different. Hynd et al. measured the variable in the form of daily
stress, while Thome and Skuladottir measured parenting stress. Again, as they did in the reporting of results for depressive symptoms, Hynd et al. did not report on significance for the reduction of stress in fathers even though it was measured. They reported a significant decrease in daily stress, from pre-test to post-test 1 and between pre-test and post-test 2 in the mothers. Also, as in the findings of depression and anxiety, Thome and Skuladottir also reported a significant decrease in stress in both mothers and fathers. Given the limitations in design (not all RCTs; and the different type of stress measured) (-1), imprecision (small sample size) (-1) and publication bias (failure to report findings) (-1), the overall quality of evidence for the reduction of stress is very low.

Summary

In summary, with only five studies on interventions for depression, anxiety and stress in fathers, and the fact that the quality of evidence for the reduction of depressive symptoms, anxiety and stress is very low, it is not possible to draw any conclusive findings or recommendations. Therefore there needs to be more research on designing effective intervention programs that not only cater for mothers, but fathers as well in reducing or preventing depression, stress and anxiety. It was beyond the scope of this thesis to consider how theory affected the design, and subsequently the outcomes of the interventions. However, the theoretical basis on which interventions are designed should also be considered in future research.
References


Chapter 6 – Methods

Procedure

The Deakin University Human Research Ethics Committee (refer to Appendix A) approved this research. Male participants along with their pregnant partners, who were 12 to 17 weeks pregnant, were recruited from Preggibellies (Professional pregnancy exercise programs based in Melbourne, Sydney and Brisbane), through flyers posted in obstetrician and general medical practitioner clinics, and through advertisements in local papers, and university newsletters. These advertisements and flyers (refer to Appendix B) outlined the purpose of the study, the frequency and type of data collection, as well as the contact details for the project manager. The time period of 12 to 17 weeks gestation enabled participants to consider the pregnancy certain (threat of miscarriage having subsided) prior to volunteering. The initial data collection started when participants were in their 18 weeks gestation.

Those interested in participating contacted the project manager, who then emailed the cover letter, plain language statements, and consent forms (refer to Appendix C) to them. These documents provided participants with information regarding the names of the researchers and their contact details, the approximate time it would take to complete the questionnaire (5 – 25 minutes) at each of the three time points, and the areas the questions would enquire about. In addition, information on confidentiality, consenting to the research project, as well as the possible benefits and risks of participating in this study were provided.

Data were collected at approximately 18 weeks gestation (T1) (mean=18.44, SD=1.62), at 25 weeks gestation (T2) (mean=26.01, SD=2.44) and 33 weeks gestation (T3) (mean=34.16, SD=2.16) (see Appendix D to I for the
respective questionnaires at each of the time points). At each time point, a secured web address for online questionnaires was emailed to participants who opted to complete the questionnaires electronically. For those (n=15 couples) who preferred hard copy questionnaires, these were posted (code-numbered for confidentiality) to the participants to be completed and returned in reply-paid envelopes. To protect the anonymity of the participants, they were assigned an ID number for use when answering the questionnaires online. Participant names, contact details and ID number were contained in separate documentation. Email reminders were sent to participants who did not complete the questionnaires within a week of each data collection time point.

Participants

Initially, 159 fathers and their partners, who could complete English language questionnaires, gave expression of interest to participate, however data were only obtained from 150 fathers. Of the 150 couples that participated in the current study, only 96 fathers and 113 mothers completed all the three antenatal time points. Twenty-one fathers and 14 mothers were missing one time point; 20 fathers and 13 mothers were missing 2 time points; and 13 fathers and 10 mothers missing were missing 3 time points (these participants were still included in the data set as they have partners that have completed all time points, and thus these missing data can be replaced using MI (Fulkerson et al., 2010)).

At the T1, the mean age of male participants was 34.07 ($SD = 5.23$; range = 21–56) years and mean age of female participants was 31.49 ($SD = 4.35$; range = 19–42). Most participants were Australian-born (74.0%), tertiary educated (78.0%); 58.0% reported an annual household income over AUD$105,000
(USD$109,200) and 4.0% below AUD $45,001 (USD$46,801). The participants were mostly married (72.7%) or in de facto relationships (21.3%). Participants also provide information on parity (see Table 1).

Table 1
Participants’ parity information

<table>
<thead>
<tr>
<th>Current Birth</th>
<th>1st Child</th>
<th>2nd Child</th>
<th>3rd Child</th>
<th>4th Child</th>
<th>5th Child</th>
<th>6th Child</th>
<th>7th Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of couples (N = 150 couples)</td>
<td>91 (60.7%)</td>
<td>23 (15.3%)</td>
<td>12 (8.0%)</td>
<td>3 (2%)</td>
<td>3 (2%)</td>
<td>0</td>
<td>3 (2%)</td>
</tr>
</tbody>
</table>

Note: 21 (14.0%) couples did not give information about parity

Materials

As observed in the six sets of questionnaires, three sets each for men and women (Appendix D to I), data was collected for a wide range of paternal and maternal variables. However for the purpose of this thesis, Empirical Study 1 and 2 were limited to the variables summarised in Table 2 and 3.

Table 2
Paternal variables collected

<table>
<thead>
<tr>
<th>Measures</th>
<th>18 weeks (T1)</th>
<th>25 weeks (T2)</th>
<th>33 weeks (T3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic Data</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression Anxiety &amp; Stress Scales-Short Form (DASS-21)</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Multidimensional Scale of Perceived Social Support (MSPSS)</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pittsburgh Sleep Quality Index (PSQI)</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td>Approximate time complete:</td>
<td>20 mins</td>
<td>5 mins</td>
<td>10 mins</td>
</tr>
</tbody>
</table>
Table 3

*Antenatal maternal variables collected*

<table>
<thead>
<tr>
<th>Measures</th>
<th>18 weeks (T1)</th>
<th>25 weeks (T2)</th>
<th>33 weeks (T3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic Data</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Depression Anxiety &amp; Stress Scales-Short Form (DASS-21)</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Multidimensional Scale of Perceived Social Support (MSPSS)</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Approximate time complete:</td>
<td>10 mins</td>
<td>5 mins</td>
<td>5 mins</td>
</tr>
</tbody>
</table>

*Demographics questionnaire*

Participants reported study-specific questions about age, education, income, marital status, and parity (see Appendix D for more information).

*Depressive, anxiety and stress symptoms*

The 21-item self-report Depression, Anxiety and Stress Scales (DASS) (Lovibond & Lovibond, 1995) were used to assess depressive, anxiety, and stress symptoms in both men and women. The DASS is rated on a four-point scale ranging from ‘not at all’ (=0), to ‘very much, or most of the time’ (=3). There are seven items in each of the three scales. The depression scale assesses lack of interest or involvement, hopelessness, self-deprecation, devaluation of life, dysphoria, anhedonia, and inertia. The anxiety scale assesses skeletal muscle effects, autonomic arousal, subjective experience of anxious affect, and situational anxiety. The stress scale assesses nervous arousal, being easily upset or agitated, irritable or over reactive, difficulty relaxing, and impatient. By summing item scores, depression, anxiety, and stress scores of each seven items can be derived. The DASS has demonstrated good internal consistency; and concurrent validity with other scales designed to discriminate between depression and
anxiety (Antony, Bieling, Cox, Enns, & Swinson, 1998; Lovibond & Lovibond, 1995). In our sample Cronbach's $\alpha$ for the 21-item DASS completed by the men was .86-.91; .79-.83; and .88 for depressive, anxiety and stress symptoms, respectively, across the three time points, and for women was .80-.90; .75-.80; and .82-.87 for depressive, anxiety and stress symptoms, respectively, across the three time points.

**Social support**

Perceived social support was assessed via the Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet, Dahlem, Zimet, & Farley, 1988). The MSPSS is a 12-item self-report questionnaire that provides assessment of three sources of support: family (FA), friends (FR), and significant other (SO) over the last eight weeks; and can be combined to give a global score of social support. Each question is answered by the participants on a 7-point Likert-type scale ranging from “very strongly disagree” to “very strongly agree”. Four items are dedicated to measure each of the three perceived social support sources. The MSPSS has demonstrated test–retest reliability and construct validity (Zimet et al., 1988; Zimet, Powell, Farley, Werkman, & Berkoff, 1990). The global score of the MSPSS was used in the current analysis; Cronbach's $\alpha$ for the MSPSS global score of the male participants (at T1) was .84. Cronbach's $\alpha$ for the MSPSS global scores of the female participants (at T1) was .72.

**Sleep quality**

The Pittsburgh Sleep Quality Index (PSQI) (Buysse, Reynolds, Monk, Berman, & Kupfer, 1988) measured sleep quality during the previous month and
was used to assess the sleep quality of the current participants. The PSQI includes the domains of: Subjective Sleep Quality, Sleep Latency, Sleep Duration, Habitual Sleep Efficiency, Sleep Disturbances, Use of Sleep Medications, and Daytime Dysfunction. The scores of each domain add up to give a global sleep quality score. The global sleep quality score of the PSQI was used in the current analysis. The PSQI has demonstrated internal homogeneity, consistency (test-retest reliability), and construct validity (Buysse et al., 1988). The PSQI has also been proven to be reliability in numerous studies (Backhaus, Junghanns, Broocks, Riemann, & Hohagen, 2002; Beck, Schwartz, Towsley, Dudley, & Barsevick, 2004; Carpenter & Andrykowski, 1998; Knutson, Rathouz, Yan, Liu, & Lauderdale, 2006). Given that the items in the PSQI are non-continuous in nature, Cronbach's $\alpha$ was not calculated.

Data analyses

Data screening

Prior to running statistical analyses, the data were screened for inaccuracies in data entry, missing values, internal consistency and the assumptions of regression using SPSS 21 FREQUENCIES, SPSS RELIABILITY ANALYSIS and SPSS REGRESSION. Missing data were missing at random (Little's MCAR test, $\chi^2 = 4526.990, p=1.00$) and were replaced using multiple imputation (MI) (Rubin, 1987) in SPSS 21. Estimates were results combined across 50 data sets. Of note, the level of variability across the imputed datasets was extremely small (the adequacy of the imputation was also checked by computing the relative efficiency of each parameter estimate). All variables'
except sleep quality’s, internal consistency was evaluated by Cronbach’s alpha (See Materials section).

Multicollinearity and singularity of variables were also examined. Multicollinearity was measured using the method suggested by Belsely et al. (1980 as cited in, Tabachnick & Fidell, 2007) Multicollinearity is present when a variable has an index score of 30 or above, in conjunction with having 2 or more variance proportion values greater than .50. No multicollinearity issues were found between all the variables used in the current project. Also, the VIF statistics and tolerance values, in regression, revealed that there was no multicollinearity.

**Empirical Study 1**

For Study 1, data was collected using the DASS, the MSPSS and the PSQI. Log transformations were applied to the DASS and the MSPSS before analysis to address skewness and kurtosis. Changes in depressive, anxiety and stress symptoms over time in both men and their partners were assessed using one-way repeated measures ANOVAs.

The prospective model of depressive, anxiety and stress symptoms was assessed by Crossed-Lagged SEM analyses (Campbell & Kenny, 1999; Finkel, 1995; Marsh & Yeung, 1997) using Mplus 7 (Muthén & Muthén, 1998-2012). The analyses tested if the variables regressed on both their own lagged score and the lagged score of the other variable at the previous time points. Specifically, the analyses tested: 1) whether depressive symptoms at each time point predicted depressive symptoms at the subsequent point and anxiety and stress symptoms individually at each time point predicted subsequent anxiety and stress symptoms (see Figure 1 and 2 in Chapter 7); 2) if depressive symptoms prospectively
predicted anxiety and stress symptoms: depressive symptoms at each time point was correlated with anxiety and stress symptoms at the next time point with anxiety and stress symptoms at the earlier time point partialled out; and 3) if earlier anxiety and stress symptoms predicted later depressive symptoms after controlling for earlier depressive symptoms. Analyses were repeated after partialling out partner’s depressive symptoms at all three time points; sleep quality at T1 and T3; and social support at T1. This was done in order to investigate if the mentioned variables had any effects on the inter-relationship between depressive, anxiety and stress symptoms.

The differences of the course of distress symptoms between men and their partners, and between first-time and non-first-time fathers, were also tested using invariance testing. Specifically, two multiple group models were run: 1) fathers versus mothers and 2) first-time fathers versus non-first-time fathers. With each analysis, the constrained model (where paths were constrained to equality across the two groups) was compared to the unconstrained model (where paths are free to vary between the two groups) using a chi-square difference test (Cheung & Lau, 2012). A significantly improved fit in the constrained model indicates at least paths do vary across groups. To pinpoint specific paths, Wald tests were done.

**Empirical Study 2**

For Study 2, data was collected using the DASS, and the MSPSS. Log transformations were applied to the DASS and the MSPSS before analysis to address skewness and kurtosis.
To examine the correlation of distress symptomatology between the men and their partners during the antenatal period, crossed-lagged path analyses (Campbell & Kenny, 1999; Finkel, 1995; Marsh & Yeung, 1997) using Mplus 7 (Muthén & Muthén, 1998-2012) were done. The analyses tested: 1) whether an individual’s distress symptoms at each time point predicted his partner’s distress symptoms at the subsequent point and vice versa; and 2) if perceived social support would moderate the effects of distress between men and their partners at each time point.
References


Chapter 7 – Empirical Study 1

The Inter-relationship between Depressive, Anxiety and Stress Symptoms in Fathers during the Antenatal Period

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Conflict of interest

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Word count of Abstract: 247

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Abstract

Objective: The aim of this study was to examine whether depressive symptoms predict anxiety and stress or whether anxiety and stress precede depressive symptoms in fathers during the antenatal period. Background: The findings of previous studies suggest that there is an association between paternal depression, anxiety and stress during the antenatal period. However, the temporal inter-relationship between these variables has yet to be investigated. Method: Data were collected from 150 expectant couples at approximately 18, 25 and 33 weeks gestation. Results: After accounting for the relative stability of depression, anxiety and stress over time, for men higher levels of anxiety earlier in pregnancy predicted higher levels of depression and stress in middle pregnancy, which predicted higher depression during late pregnancy. A similar relationship remained after partialling out the effects of partner’s depression, perceived social support, and sleep quality. Further analyses also revealed significant differences in the manifestation of distress symptoms between men and women, but not between first-time and non-first-time fathers. Conclusion: Our findings indicated a possible inter-relationship between depression, anxiety and stress for men antenatally. Our findings also showed that men who reported elevated depression, anxiety and stress earlier in the antenatal period, also reported elevated symptomology at later time points. Finally, the current findings revealed that antenatal paternal stress may play a key role in the development of depression and anxiety later in pregnancy. Therefore, it may be important to screen for early levels of antenatal stress in men, as well as depression and anxiety.

Key Words:

Depressive symptoms, anxiety, stress, men, fathers, antenatal, pregnancy
Despite the relative paucity of research into men’s depression during the antenatal period, in the postpartum period there is evidence that high levels of anxiety and stress are the strongest predictors of elevated depressive symptoms in men (e.g., Robertson et al., 2004; Wee et al., 2011); whether this is the case during the antenatal period for men is unknown. High levels of paternal depressive symptoms during the perinatal period have been shown to have detrimental effects on a couple’s relationship, on the parent-child relationship, and on children’s development (e.g., Fletcher et al., 2011; Kane & Garber, 2004; Kaplan et al., 2007; Paulson et al., 2009; Ramchandani et al., 2011). For example, children of fathers who were depressed at 8 weeks postpartum were found to have more than double the rate of emotional and behavioural problems than their peers at age 3.5 years (Ramchandani et al., 2005).

Findings from research with women revealed that antenatal depressive symptoms predicted the development of higher levels of anxiety symptoms during pregnancy and these anxiety symptoms, in turn, predicted higher levels of depressive symptoms after birth (Skouteris et al., 2009). Furthermore, in a study by Teixeira et al. (2009), it was found that both mothers and fathers had similar patterns of depressive and anxiety symptoms throughout pregnancy. The participants in their study had depressive symptoms that decreased throughout pregnancy while anxiety symptoms followed a U-shaped pattern (anxiety were high in early pregnancy and fell to their lowest levels in middle pregnancy and increased again towards childbirth). In contrast, Matthey et al. (2000) found that there was little association between paternal and maternal depressive symptoms during the antenatal period, suggesting that the course of depression might be different for fathers than for mothers.
Besides anxiety, stress has also been found to be associated with paternal depression during the perinatal period (Wee et al., 2011). In a postpartum study by Gao et al. (2009), it was found that perceived stress and low social support were associated significantly with depression scores greater than 13 on the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987). Their findings also indicated that in the postpartum period, the levels of paternal depression and stress did not differ significantly from the levels of maternal depression and stress.

**Purpose of current study**

Therefore the aim of the current study was to: 1) examine whether depressive symptoms predict anxiety and stress or whether anxiety and stress precede depressive symptoms; 2) examine the stability of depressive, anxiety and stress symptoms in men during their partner’s pregnancy; 3) to compare findings for men and their partners, and finally 4) to compare findings for first-time fathers and non-first-time fathers given the differences in antenatal mood symptoms between first-time and non-first-time fathers has yet to be explored. Partner’s depression, sleep quality and social support were controlled in all analyses as they have been found to be the most common correlates of both paternal and maternal antenatal depression (e.g., Buist et al., 2003; Castle et al., 2008; Field et al., 2006).

Given that paternal depression, anxiety and stress have been shown to be associated during the perinatal period, and that paternal anxiety and stress predict depression in men during this period (e.g., Field et al., 2006; Johnson & Baker, 2004; Matthey et al., 2003), it was hypothesised that paternal anxiety and stress
would predict depressive symptoms in men prospectively during the antenatal period, and that depressive symptoms would also prospectively predict anxiety and stress in men (see Figure 1). It was also hypothesised that paternal anxiety, stress and depressive symptoms at each time point would be predictive of that measure at the following time point (test of stability). Also, given that both mothers and fathers have been shown to experience similar patterns of distress symptoms throughout pregnancy (Teixeira et al., 2009), it was hypothesised that there would be no significant difference between the course of distress symptoms experienced by men and their partners during the antenatal period. However, it was hypothesised that there would be significant difference between the inter-relationship of distress symptoms of first-time fathers and non-first-time fathers. Although no studies to date, according to our knowledge, have compared distress symptoms between first-time fathers and non-first-time fathers, we argue that non-first-time fathers would have had more knowledge/information from previous experiences as compared to first-time fathers. Boyce et al. (2007) and Condon et al. (2004) found that having more information/knowledge about pregnancy and childbirth is protective against paternal distress. We also argue that non-first-time fathers would understand the challenges that a newborn baby brings. Another possibility that might cause a significant difference is non-first-time fathers having a previous traumatic experiences of partner’s labour and birth (cf. Bradley & Slade, 2011; Bradley, Slade, & Leviston, 2008).
Figure 1. Hypothesised model of the inter-relationships between men’s depressive, anxiety and stress symptoms during the antenatal period.

**Method**

**Participants**

Fathers ($N=150$) and their partners, who were 12 to 17 weeks pregnant, and could complete English language questionnaires were self-selected for participation in this study. This time period enabled participants to consider the pregnancy certain (threat of miscarriage having been reduced substantially) prior to volunteering. The participants were over the age of 18 years old.

**Setting**

Participants were recruited throughout Victoria, Australia, from Preggibellies (a pregnancy exercise program run by qualified physiotherapists),
obstetrician and general medical practitioner clinics, and advertisements in local papers and university newsletters.

**Design**

Data were collected at approximately 18 weeks gestation (T1) (mean=18.44, SD=1.62), at 25 weeks gestation (T2) (mean=26.01, SD=2.44) and 33 weeks gestation (T3) (mean=34.16, SD=2.16). Variables collected at each time point are summarised in Table 1.

**Measures**

**Demographics**

Participants reported study-specific questions about their age, education, income, marital status, and parity.

**Depressive, anxiety and stress symptoms**

The 21-item self-report Depression, Anxiety and Stress Scales (DASS; Lovibond & Lovibond, 1995) were used to assess distress symptoms in parents. The DASS has demonstrated good internal consistency and concurrent validity with other scales designed to discriminate between depression and anxiety (Antony et al., 1998; Lovibond & Lovibond, 1995). Cronbach's $\alpha$ for men was .86–.91; .79–.83; and .88 for depression, anxiety and stress, respectively, across the three time points, and for women was .80–.90; .75–.80; and .82–.87.
Social support

Perceived social support was assessed via the Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet et al., 1988). The MSPSS is a 12-item self-report questionnaire that provides assessment of support from family, friends, and significant other over the last eight weeks and can be combined to give a global score. The MSPSS has demonstrated test–retest reliability and construct validity (Zimet et al., 1988; Zimet et al., 1990). Global score was used in the current analysis; Cronbach's $\alpha$ was .84 and .72 for men and women respectively.

Sleep quality

The Pittsburgh Sleep Quality Index (PSQI) (Buysse et al., 1988) measured sleep quality during the previous month. The PSQI includes the domains of: Subjective Sleep Quality, Sleep Latency, Sleep Duration, Habitual Sleep Efficiency, Sleep Disturbances, Use of Sleep Medications, and Daytime Dysfunction. The scores of each domain add up to give a global score. The PSQI has demonstrated internal homogeneity, test-retest reliability, and construct validity (Buysse et al., 1988). The PSQI has also been shown to be reliable in numerous studies (e.g., Backhaus et al., 2002; Beck et al., 2004; Knutson et al., 2006). As the items in the PSQI are non-continuous in nature, Cronbach's $\alpha$ was not calculated.

Procedure

Following university ethics approval, participants were recruited. At each time point, a secured web address for online questionnaires was emailed to participants who opted to complete the questionnaires electronically. For those
(n=15 couples) who preferred hard copy questionnaires, these were posted (code-numbered for confidentiality) to the participants to be completed and returned in reply-paid envelopes. Email reminders were sent to participants who did not complete the questionnaires within a week of each data collection time point.

Data analysis

Missing data were missing completely at random (Little's MCAR test, $\chi^2=4526.990, p=1.00$) and were replaced using multiple imputation (MI) (Rubin, 1987) in SPSS 21. Estimates were combined across 50 imputed data sets. Of note, the level of variability across the imputed datasets was extremely small (the adequacy of the imputation was also checked by computing the relative efficiency of each parameter estimate). Log transformations were applied to the DASS and the MSPSS before analysis to address skewness and kurtosis. Changes in distress symptoms over time in participants were assessed using one-way repeated measures ANOVAs. Correlations between distress symptoms and other variables used in this study were also conducted to check for multicollinearity (see Table 2).

Our prospective model of depression, anxiety and stress was assessed by crossed-lagged path analyses (Campbell & Kenny, 1999; Finkel, 1995; Marsh & Yeung, 1997) using Mplus 7 (Muthén & Muthén, 1998-2012). The analyses tested if the variables regressed on both their own lagged score and the lagged score of the other variable at the previous time points. Specifically, the analyses tested: 1) whether depressive, anxiety and stress symptoms individually at each time point predicted subsequent depressive, anxiety and stress symptoms (see Figure 1); 2) if depressive symptoms prospectively predicted anxiety and stress
symptoms after controlling for anxiety and stress symptoms at the earlier time; and 3): if anxiety and stress symptoms prospectively predicted depressive symptoms after controlling for depressive symptoms at previous time points. Analyses were repeated after partialling out maternal depression at all three time points, sleep quality at T1 and T3, and social support at T1.

To test the difference of the course of distress symptoms between men and their partners, and between first-time and non-first-time fathers, invariance testing was used. Specifically, two multiple group models were run: 1) fathers versus mothers and 2) first-time fathers versus non-first-time fathers. With each analysis, the constrained model (where paths were constrained to equality across the two groups) was compared to the unconstrained model (where paths are free to vary between the two groups) using a chi-square difference test (Cheung & Lau, 2012). A significantly improved fit in the constrained model indicates at least paths do vary across groups. To pinpoint specific paths, Wald tests were done.

**Results**

Initially, 159 fathers consented to participate, however data were only obtained from 150 fathers. Of the 150 fathers who participated, only 96 fathers and 113 mothers completed all three time points. Twenty-one fathers and 14 mothers were missing one time point; 20 fathers and 13 mothers were missing 2 time points; and 13 fathers and 10 mothers missing were missing 3 time points (these participants were still included in the data set as they had partners who completed all time points, and thus the missing data were replaced using MI (Fulkerson et al., 2010)).
The mean age of fathers was 34.07 (SD=5.23; range=21–56) years and the mean age of mothers was 31.49 (SD=4.35; range=19–42). Most participants were Australian-born (74.0%), tertiary educated (78.0%); 58.0% reported an annual household income over AUD$105,000 (USD$109,200) and 4.0% below AUD $45,001 (USD$46,801). Participants were mostly married (72.7%) or in de facto relationships (21.3%). Participants also provided information on parity (see Table 3).

Changes in depressive, anxiety and stress symptoms over time

One-way repeated measures ANOVAs revealed that in men, a small but significant time effect was found for depressive symptoms, $F(2,298)=3.84, p<.05$, $\eta^2=.03$, with LSD post-hoc tests revealing depression scores were significantly (<.05) greater at T3 than at T1, but not significantly greater at T2 than at T1 ($p=.28$) (Table 3 shows mean scores). Similarly, a significant time effect was found for anxiety, $F(2,298)=3.69, p<.05$, $\eta^2=.02$. LSD post-hoc tests revealed that men did not report significantly more anxiety ($p=.06$) at T3 than at T1, but significantly more (<.05) at T2 than at T1 (Table 3 shows mean scores). No changes were found for stress, $F(1.89,282.30)=2.67, p=.10$, $\eta^2=.02$. (Greenhouse-Geisser statistics were reported as sphericity assumption was violated). Of note, the very small effect size for time revealed that depression, anxiety and stress scores were mostly stable over time (i.e., most of the sample scored in the “normal” range). The number of men in each depression, anxiety and stress category of the DASS is shown in Table 4.

In women, non-significant time effects were found for depressive symptoms, $F(1.84,274.38)=2.30, p=.13$, $\eta^2=.02$; for anxiety, $F(1.83,272.56)=2.45$,
\( p = .12, \eta^2 = .02 \); and for stress, \( F(1.89,281.23) = 2.91, p = .07, \eta^2 = .02 \). Greenhouse-Geisser statistics were reported for depression, anxiety and stress as sphericity assumption was violated. The number of women in each depression, anxiety and stress category of the DASS is shown in Tables 4. The small effect size for time revealed that women’s scores for depression, anxiety and stress were mostly stable over time.

*Prospective relationships between depression, anxiety and stress*

The specified base model (without partner’s depression, social support, and sleep quality as covariates) provided an acceptable fit to the current data, \( \chi^2 = 17.06(9), p = .048; \text{CFI} = .984; \text{RMSEA} = .077 \). This model was then rerun with the covariates added; this model fitted the data extremely well, \( \chi^2 = 32.42(27), p = .22; \text{CFI} = .988; \text{RMSEA} = .037 \).

Figure 2 shows the results from our model testing, supporting a stability model for depression, anxiety and stress over time in the base model. Depression, anxiety and stress at each time point were all associated significantly across the three time points. Furthermore, higher paternal anxiety scores at T1 were associated positively with depression and stress scores at T2, and higher paternal stress scores at T2 were associated positively with depression and anxiety scores at T3. Similar findings were replicated when the covariates were partialled out; however, higher paternal depression scores at T1 did not predict an increase in depression scores at T2. Other relationships were not significant. R-squared values for the observed variables are also reported in Figure 2.
Figure 2. Beta weights between men’s depression, anxiety and stress symptoms at T1 and T2 and between T2 and T3, after controlling for depression, anxiety and stress symptoms at the prior time point (in italics), and after also controlling for partner’s depression symptoms, perceived social support, and sleep quality at various time points (in bold). *p<.05; **p<.01; ***p<.001; solid paths were significant, dotted paths non-significant.

Differences between men and their partners (Group 1), and first-time and non-first-time fathers (Group 2)

In testing Group 1, Chi-square difference test (Cheung & Lau, 2012) revealed that the unconstrained model was a significantly better fit than the constrained model ($\Delta\chi^2=32.258$, df=18) indicating significant differences between the course of distress symptoms experienced by men and their partners. Wald tests revealed that the differences were in pathways from anxiety at T1 to T2’s...
depression and T2’s stress ($\gamma=.35, p=.026$ and $\gamma=4.60, p=.033$ respectively), T2’s anxiety to T3’s anxiety ($\gamma=-.33, p=.017$), and T2’s stress to T3’s stress ($\gamma=.35, p=.01$).

In testing Group 2, Chi-square difference test (Cheung & Lau, 2012) revealed that the unconstrained model was not a significantly better fit than the constrained model ($\Delta \chi^2=20.421, df=18$) indicating that there were no significant differences between the course of distress symptoms experienced by first-time and non-first-time fathers.

**Discussion**

Our findings indicated that higher levels of paternal depressive symptoms during the antenatal period did not predict paternal anxiety and stress symptoms. This finding is in contrast to the findings of Skouteris et al.’s (2009) study with women and Teixeira et al.’s (2009) study with both genders. Our findings also revealed that higher levels of paternal anxiety symptoms earlier on in the antenatal period prospectively predicted paternal depressive and stress symptoms around the middle of pregnancy, while higher levels of paternal stress around the middle of pregnancy predicted paternal depressive and anxiety symptoms during the late antenatal period. Anxiety levels were the lowest earlier on in the antenatal period and increased to their highest levels around the middle of pregnancy and remained quite stable until late pregnancy in men. Again, these findings contradict the findings of Skouteris et al.’s study that found anxiety were lowest in late pregnancy as compared to early or middle pregnancy in women. These findings also contradict the findings of Teixeira et al.’s study that found anxiety symptoms, in both parents, followed a U-shaped pattern throughout pregnancy.
Our findings also revealed that there were significant differences in the course of distress symptoms between men and their partners. Our results revealed that men and their partners differed in the association between anxiety symptoms earlier on in pregnancy and depressive and stress symptoms during middle pregnancy, in the association between anxiety symptoms around middle pregnancy and anxiety symptoms during late pregnancy, and in the association between stress symptoms during middle pregnancy and stress symptoms during late pregnancy. This further contradicts the findings of Teixeira et al.’s (2009) study that showed men and women having similar patterns of distress symptoms throughout pregnancy. These findings, however, are in accordance with the findings of other previous studies (e.g., Madsen, 2011; Matthey et al., 2000; Wang & Chen, 2006). These results are not surprising given that the symptoms of distress have also been shown to manifest differently in men and women during other life stages (e.g., Brownhill et al., 2002; Grigoriadis & Robinson, 2007; Winkler et al., 2006). For example, a study of 217 middle age depressed patients revealed that female patients had higher affective lability, while males patients had higher affective rigidity (Winkler et al., 2004). Brems (1995) argued that the gender differences in the experience of depression could be due to biological (e.g., genes, reproductive-related events in women), social (e.g., social roles, socioeconomic condition), and psychosocial factors (e.g., personality development, spousal abuse). This explanation for the gender differences, observed during the perinatal period and other life stages, was also supported by Grigoriadis and Robinson (2007) who suggested that the differences could be attributed to psychological, neurochemical, anatomic, hormonal, genetic, and
personality factors. Therefore, it appears that treatment of paternal perinatal distress cannot just be generalized from research with women to men.

The current findings also showed that depressive symptoms amongst men increased significantly over the antenatal period, albeit the effect size was small suggesting stability in depressive symptoms. These findings contradicted those reported by Teixeira et al. (2009), who revealed a decrease in fathers’ depression over their partner’s pregnancy. The current findings are, however, in accordance to the findings of studies with women (e.g., Heron, O’Connor, Evans, Golding, & Glover, 2004; Skouteris et al., 2009). It appears that psychopathology (measured as symptoms of depression, anxiety and stress) remain stable over the antenatal period. Men in our sample who reported elevated symptomology earlier on in the antenatal period, also reported elevated symptomology at later time points. A similar relationship remained after partialling out the effects of partner’s depression, perceived social support, and sleep quality, suggesting that anxiety and stress do contribute to later depressive symptoms over and above the effects of the covariates. The implication is that it is possible to target men who are at risk for depression during their partner’s late pregnancy, or even after-birth, given that elevated antenatal depression have been shown to be a risk factor for paternal depression in the postpartum (Wee et al., 2011), by screening for stress levels, not just depression and anxiety, earlier on in the antenatal period. Interestingly, and against our expectations, there were no significant differences in the course of distress between first-time and non-first-time fathers. The reason for not finding this expected difference needs to be investigated further. However, we suspect that one of the reasons could be due to our participants being predominantly tertiary educated, and thus were better informed about childbirth etc. To note, 14
percent of our sample did not provide information on parity. Our current finding implies that clinicians can indiscriminately treat first-time and non-first-time fathers who are antenatally distressed. Collectively, our findings suggest an interrelationship between depression, anxiety and stress in men during their partner’s pregnancy.

The current results also showed that 4 to 4.7% of the men, as compared to 9.3 to 12.7% of their partners, scored above the “normal” cut-off range on depression (see Table 4) at each time point which appears to be just higher than the Australian estimate of 3.1% (Australian Bureau of Statistics (ABS), 2007). These percentages are within the expected range found in a study sample examining perinatal mental health (Wee et al., 2013) and suggest that paternal depression experienced during this period do not occur by chance, in accordance with the findings of the meta-analysis by Paulson and Bazemore (2010a). It is also interesting to note that while the women in the current sample reported quite consistent levels of symptoms across the different subscales of the DASS at each time point, men reported higher levels of stress (6 to 8.7%) compared to other symptoms. This suggests that stress might have a key role in the development of paternal distress as current results showed high levels of stress in middle pregnancy predicting high levels of depressive symptoms in late pregnancy. It is also possible that men might be reluctant to be labelled as “depressed” (e.g., Gaylin, 2000; Heifner, 1997), but they might feel more comfortable admitting to being stressed. Therefore, it is important to screen for stress levels in men, and not just depression and anxiety in preventing/treating perinatal distress. Also, Madsen (2011) and Wang and Chen (2006) have argued that men’s distress affect might not be well represented in diagnostic interviews or self-report measures. For
example, Madsen has found that outbursts of anger, alcohol and substance abuse manifested more frequently in men who were distressed postnatally. Our findings are in accord with this argument as indicated by men reporting higher levels of stress compared to other distress symptoms. Therefore more research needs to uncover what best describe the distress affect men experience during the perinatal period.

Limitations of this study include the use of a convenience sample in which participants were predominantly tertiary educated and earning high family incomes, the self-report nature of obtaining data (internal validity issue; e.g., recall bias and social desirability bias), and no assessment of additional risk factors for paternal mental health during the perinatal period. We also acknowledge that we cannot be certain that the distress symptoms measured in our current study were specific to the antenatal period. These limitations may impact the generalisability and clinical application of our results. Specifically, the manifestation of mood symptoms might be different in a sample from lower educational backgrounds and earning lower family income as the challenges they face might be different. Tran, Tran, and Fisher (2012) have shown, in their study validating psychometric instruments for screening perinatal mental disorders in men in the north Vietnam, that the prevalence rate of paternal perinatal depression is more pronounced in low-income communities. The reasons for the difference have yet to be determined. However, finances have been shown to be one of the causes of anxiety and stress for fathers (Hanson et al., 2009).

In summary, the current findings indicate that there is a possible inter-relationship between depression, anxiety and stress for men during their partner’s pregnancy. Future research should consider exploring the prospective
relationships between these variables in the postpartum to determine if the association shown during pregnancy continues. Future research should also investigate what causes men to be vulnerable to distress. This in turn could help with the design of prevention/treatment programs which are currently lacking for men experiencing antenatal distress. Also, the current findings do seem to indicate that the manifestation of antenatal distress symptoms is different in men than in women, and that stress might have a key role in the development of distress in men perinatally. This is important as researchers/clinicians need to design/plan treatment programs for men that may be different from those designed for women, and also to screen for stress levels as well as depression and anxiety. This may provide important information about fathers’ antenatal wellbeing and direct interventions, reducing later psychological distress. This is important as reducing psychological distress in fathers would better the psychological outcomes for the mothers and infants as high levels of paternal perinatal distress have been shown to be associated to maternal distress and is detrimental to children’s development (Ramchandani et al., 2011).
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predictors of men's stress, anxiety and depression following pregnancy,


Table 1.  
*Paternal and maternal variables collected*

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*Paternal variables collected are indicated in **bold**; and in parentheses for their partners.*
### Table 2

Correlations between Depression, Anxiety and Stress (N = 150)

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*Correlations performed on transformed variables. *p < .05; **p < .01; ***p < .001; DEP = Depression subscale of the DASS (score range: 0–42); AN = Anxiety subscale of the DASS (score range: 0–42); STRESS = Stress subscale of the DASS (score range: 0–42); Partner DEP, Partner AN and Partner Stress = Partner's depression, anxiety and stress respectively as measured by the DASS (score range: 0–42); Social Sup = global score of the MSPSS (score range: 12–84); Partner SS = Partner’s global score of the MSPSS (score range: 12–84); Sleep = global sleep quality score of the PSQI (score range: 0–21); Partner Sleep = Partner’s global sleep quality score of the PSQI (score range: 0–21).
Table 3

Participants’ parity information

<table>
<thead>
<tr>
<th>Current Birth</th>
<th>1st Child</th>
<th>2nd Child</th>
<th>3rd Child</th>
<th>4th Child</th>
<th>5th Child</th>
<th>6th Child</th>
<th>7th Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of couples</td>
<td>91 (60.7%)</td>
<td>23 (15.3%)</td>
<td>12 (8.0%)</td>
<td>3 (2%)</td>
<td>3 (2%)</td>
<td>0</td>
<td>3 (2%)</td>
</tr>
</tbody>
</table>

(N = 150 couples)

Note: 21 (14.0%) couples did not give information about parity
Table 4
Number and percentage of men and their partners in each of the depression, anxiety and stress categories of the DASS

<table>
<thead>
<tr>
<th>Depression</th>
<th>Anxiety</th>
<th>Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>Mild</td>
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<tr>
<td>0-9</td>
<td>144 (96%)</td>
<td>131 (98.3%)</td>
</tr>
<tr>
<td>10-13</td>
<td>2 (1.3%)</td>
<td>9 (0.6%)</td>
</tr>
<tr>
<td>14-20</td>
<td>3 (2%)</td>
<td>64 (4.2%)</td>
</tr>
<tr>
<td>21-27</td>
<td>0</td>
<td>4 (2.7%)</td>
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<tr>
<td>28+</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Number and percentage of men in each of the depression, anxiety and stress categories of the DASS is in **bold**; and in *italics* for their partners.
Chapter 8 – Empirical Study 2

Effects of Perceived Social Support on Distress in Men and their Partners during the Antenatal Period

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Word count of Abstract: 314

Word Count: 4,505 (excluding Abstract, Key words and References)

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Abstract

Objective: The aim of this study was to examine whether men’s distress symptoms at early, mid and late pregnancy predicted their partner’s subsequent distress symptoms, whether women’s distress symptoms at early, mid and late pregnancy predicted men’s subsequent distress symptoms, and to investigate the moderating effects of social support on the relationship between men’s and their partner’s levels of distress. Background: Research, though relatively scarce, on paternal perinatal mental wellbeing has revealed that partner’s depression and low social support are associated with depression in both genders, and that depression, anxiety and stress often co-exist. Social support has also been found to moderate the effects between psychological symptoms. However, the moderating effect of social support on the relationship between men’s and their partner’s levels of distress has not been studied during the perinatal period. Method: Data were collected from 150 expectant couples at approximately 18, 25 and 33 weeks gestation. Results: The results revealed that higher levels of paternal distress at each time point did not predict higher levels of maternal distress at the following time point, and vice versa. However, men’s and their partner’s levels of distress symptoms were correlated at earlier and late pregnancy. Social support also did not significantly moderate the relationship between paternal and maternal levels of distress. However, paternal distress symptoms at each time point were found to be predictive of that measure at the following time point. Low levels of perceived social support in men earlier on in their partner’s pregnancy also positively predicted higher levels of paternal distress earlier on in their partner’s pregnancy. Conclusion: Our findings indicate that fathers should have a strong social support network during the antenatal period as having a good social support network
earlier on in their partner’s pregnancy might mitigate the levels of distress earlier in the antenatal period which in turn, might mitigate the levels of distress across the antenatal period.

**Key Words:**

Distress symptoms, social support, men, antenatal, pregnancy
**Introduction**

Studies assessing mothers’ and fathers’ mood affects during the perinatal period should be mindful that a parent’s emotional state is not independent of the other parent’s emotional state and characteristics (Peugh et al., 2013). Social contextual/dyadic dependence theories suggest that data collected from persons interacting within dyads are not independent, but are likely to be more correlated than data from individuals in different dyads (Peugh et al., 2013). A dyad is defined as a shared association between a pair of individuals (Peugh et al., 2013) or major social roles with which two persons are involved (Pearlin, 1989), for example, a married couple, a set of monozygotic or dizygotic twin, or a parent-child pair. Therefore, perinatal studies that use individualistic models might neglect interpersonal phenomena, such as interdependence and reciprocity between significant partners (Kahana & Young, 1990; Peugh et al., 2013; Pruchno, 1994; Thompson & Walker, 1982). Assuming independence when interdependence/dyadic dependence is present in the data can significantly bias findings and their interpretation (Gonzalez & Griffin, 1997; Peugh et al., 2013). Thus, analysing data on a dyadic level (dyadic analysis) allows for the creation, transmission, and maintenance of emotional states (e.g., psychological perinatal distress), that are uniquely attached to individuals within a dyad, to be examined (i.e., examining the reciprocal or interactive influences between individuals of a dyad) (DeLongis & O’Brien, 1990; Hammen, 1999; Holahan, Moos, & Bonin, 1999; Peugh et al., 2013). This is especially important for studies with men and their partners during the perinatal period.
**Significant risk factors: partner’s depression and anxiety**

Evidence supporting reciprocity of depressive symptomology in men and their partners can be found in the literature on depression during the perinatal period. A systematic review by Wee et al. (2011), on depression in men during the perinatal period, found that having a partner who is depressed is the most common significant correlate for depression in men during the perinatal period. In a study by Bielawska-Batorowicz and Kossakowska-Petrycka (2006), it was found that the levels of depression experienced by the male’s partner were correlated positively with depression in men post-birth ($r = .76, p < .001$).

Consistent with Bielawska-Batorowicz and Kossakowska-Petrycka’s (2006) findings, Gao et al. (2009) found that a man’s depression was positively and moderately associated with his partner’s depression. Additionally, high perceived stress and a lack of social support were positively and moderately associated with depressive symptom scores greater than 13 on the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987).

Another risk factor for depression in men during the perinatal period is anxiety (Wee et al., 2011). Field et al. (2006) found that men whose partners were depressed experienced significantly higher levels of anxiety and depression. A similar effect was found in women who were coupled with a depressed partner. To our knowledge, Field et al.’s study is the only study that has investigated the correlations between maternal and paternal depression during the antenatal period. In the postpartum period, Matthey et al. (2003) found that men who met the criteria for depression, anxiety or both, their female partner was two to three times more likely to also meet the criteria. Matthey et al. suggested that depression and anxiety might comorbid during the perinatal period in both men...
and women. It is important to note that Field et al.’s and Matthey et al.’s studies are cross-sectional in design which do not permit directional and causal conclusions about variables to be made.

**Comorbidity of depression, anxiety and stress – psychological distress**

Like anxiety, stress has been found to have a strong association with elevated depressive symptoms in men during the perinatal period (Wee et al., 2011; Wee, Skouteris, Richardson, McPhie, & Hill, 2015). In the antenatal period, it was found that, after accounting for the relative stability of depressive, anxiety and stress symptoms over time, for men higher levels of anxiety symptoms earlier on in pregnancy predicted higher levels of depressive and stress symptoms in middle pregnancy, which predicted higher depressive symptoms during late pregnancy (Wee et al., 2015). A similar relationship remained after partialling out the effect of partner’s depressive symptoms, perceived social support, and sleep quality in men. Therefore, Wee et al. (2015) concluded that perinatal studies should investigate psychological distress (i.e., depression, anxiety and stress as composite negative emotional affect) as opposed to examining a single mood affect (i.e., depression, anxiety or stress).

**Social support**

As discussed above, in the study by Gao et al. (2009), low social support does not only have a strong association with elevated depressive symptoms, but is also a common risk factor of depression in both men and women during the perinatal period (e.g., Castle et al., 2008; Gao et al., 2009; Leathers et al., 1997; Milgrom et al., 2008a; Wang & Chen, 2006; Wee et al., 2011). Low social
support has also been shown in meta-analytic studies (Beck, 1996, 2001; O'Hara & Swain, 1996) to be one of the six risk factors of postnatal depression in women which exert the largest effects (Milgrom et al., 2008a; Robertson et al., 2004). In addition, low social support has been found to be one of the most common correlates of depression in men around their partners’ pregnancy and in the postpartum period (Wee et al., 2011).

Social support has also been found to moderate the effects between psychological symptoms (e.g., Chen, Siu, Lu, Cooper, & Phillips, 2009; Honey, Morgan, & Bennett, 2003b; Lonergan, 2014; Moshe, Miriam, Jonathan, Patricia, & Paul, 2012; Uebelacker et al., 2013; Xu & Wang, 2012; Xu & Wei, 2013). Interestingly, not only does social support has a mitigating effect on concurrent depression, social support has been shown to have a mitigating effect on depression at later time points (Moshe et al., 2012; Uebelacker et al., 2013). However, the moderating effect of social support has received relatively little attention in the study of psychological distress during the perinatal period. In a study, unrelated to childbirth, social support was found to moderate the association between anxiety and depression in adult survivors of the Wenchuan earthquake (Xu & Wei, 2013). Results from interviews with 2080 survivors showed that social support mitigated the negative effects of anxiety and depression amongst the survivors, revealing that anxiety was associated significantly with depression, while higher levels of social support lessened depression. In another study, unrelated to childbirth, social support was found to moderate the relationship between dementia patients’ level of cognitive impairment and the mental wellbeing of the caregiver (Lonergan, 2014). Using longitudinal data collected from 643 Alzheimer’s patients and their family
caregivers, Lonergan found that the cognitive functioning of the care-recipients was associated significantly with the caregivers’ levels of depression; results also showed that caregivers who reported higher levels of satisfaction with their social support were less impacted by the cognitive functioning of care-recipient.

**Purpose of current study**

Given that the dyadic dependence theory suggests data collected from persons interacting within dyads are likely to be correlated (Peugh et al., 2013), and that social support has been found to moderate the effects between psychological symptoms, the aim of this study was to examine the reciprocal or interactive influences between men and their partners on distress (depression, anxiety and stress) symptomatology during the antenatal period, and whether individual-level (individual levels of social support) and dyadic-level characteristics (reciprocal influences) predict differences in distress symptoms. Specifically, the current study aimed to: 1) examine whether men’s distress symptoms at each time point would be predictive of their partner’s distress symptoms at the following time point and vice versa (see Figure 1); and 2) investigate the moderating effects of perceived social support on the relationship between men’s and their partner’s levels of distress symptoms (see Figure 2). As studies have shown that a partner’s distress symptoms are risk factors for distress in a parent during the perinatal period (Bradley & Slade, 2011; Mao et al., 2011; Paulson & Bazemore, 2010a; Wee et al., 2011), it was hypothesised that an increase in distress symptoms in men would significantly predict an increase in distress symptoms in their partner at the following time point and vice versa. Also, given that social support was found to moderate the reciprocal associations
between mental wellbeing between individuals (Lonergan, 2014), it was hypothesised that higher levels of perceived social support would buffer the reciprocal influences between men and their partners on distress.

Figure 1. Cross-lagged model of distress between men and their partners.

Method

Participants

Men (N=150) and their partners, who were between the 12th and 17th weeks gestation, and could complete English language questionnaires were self-selected for participation. This time period enabled participants to consider the pregnancy relatively certain (threat of miscarriage having subsided) prior to volunteering. The participants were over the age of 18 years old.

Setting

Participants were recruited throughout Victoria, Australia, from Preggibellies (a pregnancy exercise program run by qualified physiotherapists), obstetrician and general medical practitioner clinics and advertisements in local papers, and university newsletters. Data were collected from March 2010 to January 2012.
Design

We conducted a prospective longitudinal study through the antenatal period. Participants completed depressive, anxiety and stress symptoms measures at approximately 18 weeks gestation (Time Point 1; T1) (mean gestation weeks=18.44, $SD=1.62$), 25 weeks gestation (Time Point 2; T2) (mean gestation weeks=26.01, $SD=2.44$) and 33 weeks gestation (Time Point 3; T3) (mean gestation weeks=34.16, $SD=2.16$). Variables collected at each time point are summarised in Table 1.

Measures

Demographics

Participants reported study-specific questions about their age, education, income, marital status, and parity via a demographics questionnaire.

Distress symptoms

The 21-item self-report Depression, Anxiety and Stress Scales (DASS; Lovibond & Lovibond, 1995) were used to assess depressive, anxiety and stress symptoms in both men and women. The DASS has demonstrated good internal consistency and concurrent validity with other scales designed to discriminate between depression and anxiety (Antony et al., 1998; Lovibond & Lovibond, 1995). In our sample Cronbach's $\alpha$ for the DASS completed by men was .86–.91; .79–.83; and .88 for depressive, anxiety and stress symptoms, respectively, across the three time points, and for women was .80–.90; .75–.80; and .82–.87 for depressive, anxiety and stress symptoms, respectively, across the three time points.
Perceived Social support

Perceived social support was assessed via the Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet et al., 1988). The MSPSS is a 12-item self-report questionnaire that provides assessment of three sources of support: family (FA), friends (FR), and significant other (SO) over the last eight weeks and can be combined to give a global score of social support. The MSPSS has demonstrated test–retest reliability and construct validity (Zimet et al., 1988; Zimet et al., 1990). The global score of the MSPSS was used in the current analysis; Cronbach's $\alpha$ for the MSPSS global scores were .84 and .72 for men and women respectively.

Procedure

Following university ethics approval, men and their pregnant partners were recruited. At each time point, a secured web address for online questionnaires was emailed to participants who opted to complete the questionnaires electronically. For those (n=15 couples) who preferred hard copy questionnaires, these were posted (code-numbered for confidentiality) to the participants to be completed and returned in reply-paid envelopes.

Data analysis

Unit of analysis for the current study was expectant parent dyads. One hundred and fifty-nine men and their partners initially consented to participate, however data were only obtained from 150 couples. Of the 150 couples, only 96 fathers and 113 mothers completed all time points. Twenty-one fathers and 14 mothers were missing one time point; 20 fathers and 13 mothers were missing
two time points; and 13 fathers and 10 mothers missing were missing three time points. Participants with missing data were still included in the data set as they had partners who completed all time points, and thus the missing data were replaced using multiple imputation (MI) (Fulkerson et al., 2010). Missing data were missing completely at random (Little's MCAR test, $\chi^2=4526.990, p=1.00$) and were replaced using MI (Rubin, 1987) in SPSS 21. Estimates were results pooled across 50 imputed data sets. Of note, the level of variability across the imputed datasets was extremely small (the adequacy of the imputation was also checked by computing the relative efficiency of each parameter estimate). Log transformations were applied to the DASS and the MSPSS before analysis to address skewness and kurtosis. The scores of the Depression, Anxiety and Stress Scales were then standardized and averaged to produce a composite measure of negative emotional symptoms (i.e., distress) (Lovibond & Lovibond, 1995). Correlations between depressive, anxiety and stress symptoms, and social support were also conducted to check for multicollinearity (see Table 2).

The current prospective model of distress between men and their partners was assessed by crossed-lagged path analyses (Campbell & Kenny, 1999; Finkel, 1995; Marsh & Yeung, 1997) using Mplus 7 (Muthén & Muthén, 1998-2012). The analyses tested: 1) whether an individual’s distress symptoms at each time point predicted his partner’s distress symptoms at the subsequent point and vice versa (see Figure 1); and 2) if perceived social support would moderate the effects of distress between men and their partners at each time point (see Figure 2).
Figure 2. Cross-lagged model of distress, with social support as moderator, between men and their partners.

Results

The mean age of fathers was 34.07 (SD=5.23; range=21–56) years and the mean age of mothers was 31.49 (SD=4.35; range=19–42). Most participants were Australian-born (74.0%) and tertiary educated (78.0%). About half of the participants (58.0%) reported an annual household income over AUD$105,000 (USD$109,200), while 4.0% reported an annual household income below AUD
$45,001 (USD$46,801). Participants were mostly married (72.7%) or in de facto relationships (21.3%). Ninety-one (60.7%) of the couples were expecting their first child; 23 (15.3%) were expecting their second child; 12 (8%) were expecting their third child; while 9 (6%) were expecting their fourth, fifth and seventh child.

**Cross-lagged model of distress between men and their partners**

The specified base model (without social support as moderator) provided a very good fit to the current data, $\chi^2=8.73(5), p=.12; \text{CFI}=.987; \text{RMSEA}=.071$. This model was then rerun with the moderator added; this model provided an adequate fit to the current data, $\chi^2=59.18(32), p=.002; \text{CFI}=.918; \text{RMSEA}=.075$.

The results from the base model indicate that higher levels of distress in men at T1 is associated positively with higher levels of distress at T2, and higher levels of distress at T2 were also associated positively with higher levels of distress at T3 (see Figure 3). Similar results were found for women. In women, higher levels of distress T1 were associated positively with higher levels of distress at T2, and higher levels of distress at T2 were also associated positively with higher levels of distress at T3 (see Figure 3). Further testing shows men’s distress at a time point did not predict their partner’s distress at the following time point. However, analysis did show that men’s and their partner’s distress were correlated at T2 and T3 ($r = .16, p < .05; r = .23, p < .01$ respectively). Similar findings were observed when social support was added as moderator. There was no significant moderating effect of social support on the relationship between individuals’ and their partners’ distress each of the time points. However, with the added moderator, higher levels of distress in men at T2 significantly predicted higher levels of distress in their partner at T3 (see Figure 4); albeit this is
attributed to suppression\textsuperscript{6} that was caused by the inclusion of the moderator (cf. Cohen, 1988). The current results show no associations between men’s distress and their partner’s distress at every time point prior to the inclusion of social support. Also of note, there was very little $R^2$ changes between the base model and the model with the moderator added indicating that social support explained very little of the variance. Further analyses also revealed that low perceived social support (T1) significantly predicted higher levels of distress in men at baseline (T1). All other pathways were non-significant (see Figure 4).

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure3.png}
\caption{Unstandardized correlation coefficients between men’s distress symptoms and their partner’s distress. ***$p<.001$; solid paths were significant, dotted paths non-significant.}
\end{figure}

\textsuperscript{6} Suppression happens when the inclusion of a third variable (suppressor) strengthens the magnitude of the relationship between the independent variable and the dependent variable that is otherwise unrelated (MacKinnon, Krull, & Lockwood, 2000).
Figure 4. Unstandardized correlation coefficients between men’s distress symptoms and their partner’s distress with social support as moderator. *p<.05; **p<.01; ***p<.001; solid paths were significant, dotted paths non-significant.

Discussion

Research on paternal mental wellbeing during the perinatal period is relatively scarce; this is particularly so for the antenatal period. Although a few studies (e.g., Field et al., 2006; Wee et al., 2015) have found an association between paternal and maternal depression during the antenatal period, no studies
had examined if such an association exists between paternal and maternal distress (depression, anxiety and stress as composite negative emotional affect). Our current study is unique as it is the first study, to our knowledge, to examine whether men’s distress symptoms at each time point is predictive of their partner’s distress symptoms at the following time point and vice versa, and to examine the moderating effects of an individual’s perceived social support on the reciprocal influences between men and their partners on distress. This could have important implications for clinical interventions.

Inconsistent with the hypothesis that states that an increase in distress symptoms in men would significantly predict an increase in distress symptoms in their partner at the following time point, our findings revealed, against our expectations, that there were no significant reciprocal associations between men’s and their partner’s distress symptomatology. Higher levels of distress in men at each time point did not predict higher levels of distress in their partner at the following time point, and vice versa. However, men’s and their partner’s levels of distress symptoms were correlated at earlier and late pregnancy. This finding is consistent to the findings reported by Field et al. (2006) who found men’s levels of anxiety and depression were correlated to their partner’s depression. Our result is also consistent to the findings of Matthey et al.’s (2003) study that showed when the men in their study met the criteria for depression, anxiety or both, their partner was two to three times more likely to also meet the criteria. Further analyses also revealed that social support did not significantly moderate the relationship between men’s and their partner’s levels of distress symptoms. This finding contradicts the findings of various studies (e.g., Chen et al., 2009; Honey et al., 2003b; Lonergan, 2014; Xu & Wang, 2012; Xu & Wei, 2013) that found
social support to have moderated the effects between psychological symptoms. The reasons for the contradicting results between our study and the findings of other studies need to be investigated further. However, we speculate that the reasons for the differences in findings can be attributed to the use of different measures of social support, the different types of social support measured, and the different life stages at which social support was measured. These factors could have influenced the moderating effects of social support on distress as well as contributing to the lack of reciprocal relationships between men’s and their partner’s distress symptomatology. For example, in Xu and Wei’s (2013) study discussed above, the Social Support Rating Scale (SSRS; Xiao, 1993) was used to measure subjective support, objective support and support availability in adult survivors after the Wenchuan earthquake whereas in our current study, the MSPSS was used to measure social support from family, friends, and a significant other during the antenatal period. Therefore, the types of social support measured in our study might not be relevant to the experiences of distress during the antenatal period. The experiences of distress symptomatology have been shown to differ at different life stages (Wee et al., 2013; Wee et al., 2011); and this could have influenced the association between social support and distress during the antenatal period. Another reason for not finding a significant association between social support and distress, and the lack of reciprocal relationships between men’s and their partner’s distress symptomatology, might be due to our sample being from a non-clinical population. Results might be different with a clinical sample that have a much higher manifestation of distress symptoms.

However, our results showed that low levels of perceived social support in men earlier on in their partner’s pregnancy predicted higher levels of paternal
distress earlier on in their partner’s pregnancy. This finding is consistent with previous studies that showed low social support to be positively associated with distress in men during the perinatal period (e.g., Castle et al., 2008; Gao et al., 2009; Leathers et al., 1997; Milgrom et al., 2008a; Wang & Chen, 2006; Wee et al., 2011). This finding is important as our results also showed that distress symptoms in men at each time point were predictive of that measure at the following time point. This finding is also consistent with previous studies (e.g., Areias et al., 1996; Matthey et al., 2000; Ramchandani et al., 2008b) that also showed distress symptoms to be predictive of that measure across the perinatal period. The implication of this is that higher distress symptoms in men earlier on in their partner’s pregnancy will lead to higher symptomology during middle and late pregnancy in men. Therefore, it is important that fathers have a good social support network during the antenatal period as our results show that having low social support is a risk factor for distress earlier on in pregnancy which could lead to higher distress later on in their partner’s pregnancy. For men, having a good social support network earlier on in their partner’s pregnancy might mitigate the levels of distress earlier in the antenatal period which in turn, might mitigate the levels of distress across the antenatal period. Of note, information on social support was only collected at the initial assessment time point and not at other assessment time points. Given that the results showed that low social support in men did not predict higher levels of paternal distress at any other time points except at baseline, this might indicate that social support might vary across the antenatal period in men. Therefore more research is needed to determine if this is so for social support.
In our study, low perceived social support in women, however, was found
to have no significant association with women’s distress across the antenatal
period. The difference in the effects of perceived social support on men and
women could be explained by the differences in assigning importance to the
different types of social support by the gender. In a study that investigated the risk
factors of social gratification (positive response to social involvements), support,
control at work and in the parenting role, and mood in first-time couples, Leathers
et al. (1997) found that support from their bosses and social gratification at work
were comparatively less important for men than for women in mediating levels of
depression. This might indicate that social support in an individual’s personal life,
external to work, is more important for men than for women. Of note, Leathers et
al. measured social support in men and women in the postpartum using a
modified version of the Social Support Network Inventory (Flaherty, Gaviria, &
Pathak, 1983) that provides assessment of sources of support from spouse,
parents, boss and coworkers, and one additional significant other (a friend or
relative). Even though Leathers et al. use a different measure of social support,
and assessed their participants at a different period of time (postpartum) as
compared to our study, Leather et al.’s findings do indicate the differences in
assigning importance to the different types of social support by the gender. In our
current study, only data about social support from family, friends and a significant
other were collected; no data about social support from other sources were
collected. Therefore, our current findings suggest that, while low social support
might have been found to be a common risk factor of depression in men and
women during the perinatal period in other studies (e.g., Castle et al., 2008; Gao
et al., 2009; Leathers et al., 1997; Milgrom et al., 2008a; Wang & Chen, 2006;
Wee et al., 2011), the experience of social support might be different in men and women. The implication of this is that, while it is important to involve the social networks of men and women in preventing/treating distress during the antenatal period, it is vital to recognise that different types of social support may have different effects on distress in men and women during this period.

Limitations of the current study include the use of a convenience sample in which participants were predominantly tertiary educated and earning high family incomes, and the self-report nature of obtaining data (internal validity issue; e.g., recall bias and social desirability bias). These limitations may impact the generalisability and clinical application of our results. Specifically, as noted by Wee et al. (2015), the manifestation of distress symptoms might be different in a sample from lower educational backgrounds and earning lower family income as the challenges they face might be different. In a study by Hanson, Hunter, Bormann, and Sobo (2009), finances have been shown to be one of the causes of anxiety and stress for fathers.

In summary, the current findings indicate that there were no significant reciprocal influences between men and their partner on distress symptomatology (i.e., higher levels of distress in men at each time point did not predict higher levels of distress in their partner at the following time point, and vice versa. However, men’s and their partner’s levels of distress symptoms were correlated at earlier and late pregnancy). Social support also did not significantly moderate the relationship between men’s and their partner’s levels of distress symptoms. However, the current findings showed that paternal distress symptoms at each time point were predictive of that measures at the following time point. Our results further indicate that low levels of perceived social support in men earlier
on in their partner’s pregnancy were predictive of higher levels of paternal distress earlier on in their partner’s pregnancy. This finding is important as it indicates that fathers should have a good social support network during the antenatal period as having a good social support network earlier on in their partner’s pregnancy might mitigate the levels of distress earlier in the antenatal period which in turn, might mitigate the levels of distress across the antenatal period. The current results also do seem to indicate that the experience of social support might be different in men and women. This is important as clinicians who choose to involve the social networks of their patients while treating them for perinatal distress need to recognize that different types of social support might have different moderating effects on distress in men and women. As mentioned above, information on social support was only collected at the initial assessment time point and not at other assessment time points. Given that the results showed that low social support in men only predicted higher levels of paternal distress at baseline, this might indicate that social support might vary across the antenatal period in men. Future research should collect information on social support in men at various assessment points throughout the antenatal period to determine if the perception of social support does change over time in men, and to investigate the effects of social support on paternal distress during the antenatal period.
References


Table 1. 
*Paternal and maternal variables collected*

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*Paternal variables collected are indicated in **bold**; and in parentheses for their partners.*
Table 2
Correlations between variables used in current study (N = 150)

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*Correlations performed on transformed variables; **p < .01, *p < .05; DEP = Depression subscale of the DASS (score range: 0–42); AN = Anxiety subscale of the DASS (score range: 0–42); STRESS = Stress subscale of the DASS (score range: 0–42); Partner_Dp, Partner_An and Partner_Stress = Partner's depression, anxiety and stress respectively as measured by the DASS (score range: 0–42); Social Sup = global score of the MSPSS (score range: 12–84); Partner_SS = Partner’s global score of the MSPSS (score range: 12–84).
Chapter 9 – Summary and General Discussion

There is a prevalent belief that only women are affected by depression during pregnancy and the postpartum period, and, as a consequence, most research to date has focused on mothers. However, recent research has shown that men are affected by depression during the ante- and postnatal period as well (e.g., Bradley & Slade, 2011; Edward et al., 2015; Figueiredo & Conde, 2011; Fletcher et al., 2006; Matthey et al., 2003; Tuszyńska-Bogucka & Nawra, 2014; Wee et al., 2011). Prevalence rates of non-clinically diagnosed depression for men during their partner’s pregnancy and after birth, though variable, have been shown to be higher than that of the general population across many countries (Bradley & Slade, 2011; Edward et al., 2015; Paulson & Bazemore, 2010a; Tuszyńska-Bogucka & Nawra, 2014; Wee et al., 2013; Wee et al., 2011). The significantly higher rate of men experiencing elevated levels of depressive symptoms across many countries, as compared to men at other life stages, suggests that paternal depression during the perinatal period does not happen by chance and is not confined to certain cultures or territories. Studies have also shown that depression in men around the perinatal period has a detrimental effect on the relationship between men and their partners, between the parent and child, and also has a negative effect on children’s development (e.g., Deater-Deckard et al., 1998; Fletcher et al., 2011; Kane & Garber, 2004; Kaplan et al., 2007; Paulson et al., 2006; Paulson et al., 2009; Ramchandani et al., 2005; Ramchandani et al., 2008a; Ramchandani et al., 2011; Ramchandani et al., 2008b; Robertson et al., 2004; Sethna, Murray, Ntsi, Psychogiou, & Ramchandani, 2015).
Given that research findings have shown that some fathers do experience depression during the perinatal period, it is important that the risk factors for depression in men during this period are known. To date, most studies have just explored uni-directional associations between potential correlates and/or risk factors for depression during the ante-and postnatal period in men, with most studies focusing on identifying correlates or risk factors of paternal depression in the postpartum (Wee et al., 2011). Studies that were conducted through pregnancy had limited (most only have one collection time point) assessment points during gestation (e.g., Areias et al., 1996; Boyce et al., 2007; Condon et al., 2004; Deater-Deckard et al., 1998). Understanding the risk factors of paternal depression during the antenatal period is just as important as understanding the risk factors of depression in men in the postpartum period, given that the prevalence of elevated antenatal depressive symptoms is as high as the prevalence of elevated depressive symptoms in men during the postnatal period (Wee et al., 2011). Therefore, a complete model of the development of depressive symptoms during the perinatal period which is multi-factorial and inclusive of bio-psycho-social variables is needed for men. Previous research has been informative but has been limited in terms of theory building. Hence, a more rigorous and systematic investigation of direct and indirect (mediators and moderators) predictors of depression in men during the ante-and postnatal periods is needed.

Given the paucity of research, the focus of this thesis is on men’s depressive symptoms in the antenatal period. The overall aim is to extend the research conducted to date by adopting a prospective longitudinal design, increase the time points of assessment through pregnancy to ensure the measurement of variables is more systematic and rigorous. This broad aim was addressed across
two systematic reviews and two empirical studies. Given that there have not been other similar systematic reviews done, updates to the two reviews were undertaken. An evaluation of the effectiveness of current intervention programs that were designed specifically for men who were suffering from depression during the perinatal period was also done.

In this chapter, a discussion of the results addressing the overall aims of the thesis is presented. The implications of the findings are also presented. Furthermore, the strengths, limitations and suggestions for future research are discussed and the chapter concludes with a summary of the major findings.

**Major findings**

*Systematic reviews and evaluation of intervention programs*

Over the course of this PhD candidature, two systematic reviews (Wee et al., 2013; Wee et al., 2011) have been done and published (see Chapters 2 and 3). To my knowledge, the first of the two systematic reviews (Wee et al., 2011), was the first to focus on the correlates and predictors of depressive symptoms in men during *both* the ante- and postnatal period. This review is a systematic conceptual and methodological analysis of the literature on the correlates and predictors of depressive symptoms in expectant fathers pre- and post-birth. Twenty-six articles that were relevant to the review were identified. Of the 26 empirical papers, one was a qualitative study (Davey et al., 2006); 11 studies adopted a cross-sectional design, one of which focused on paternal depression during pregnancy (Field et al., 2006) and the rest on depression during the postpartum (Bielawska-Batorowicz & Kossakowska-Petrycka, 2006; Bronte-Tinkew et al., 2007; Davé et al., 2005; Dudley et al., 2001; Gao et al., 2009; Matthey et al., 2003; Pinheiro et
al., 2006; Roberts et al., 2006; Wang & Chen, 2006; Zelkowitz & Milet, 1997). The remaining 14 studies were longitudinal in design assessing participants both in the ante- and postnatal period (Areias et al., 1996; Boyce et al., 2007; Buist et al., 2003; Castle et al., 2008; Chien-Chung & Warner, 2005; Condon et al., 2004; Deater-Deckard et al., 1998; Johnson & Baker, 2004; Leathers et al., 1997; Matthey et al., 2000; Perren et al., 2005; Ramchandani et al., 2008a; Ramchandani et al., 2008b; Soliday et al., 1999). According to the reviewed studies, having a depressed partner, poor state or quality of the relationship between men and their partner, and low social support are the most common correlates of depression in men around their partners’ pregnancy and post-birth. Other risk factors such as the lack of information about pregnancy and childbirth, poor social support (Boyce et al., 2007; Condon et al., 2004), and gender role stress, were also found to be associated with paternal depression both pre- and post-birth. This systematic review (Wee et al., 2011) also revealed that the majority of the reviewed studies were focused on identifying correlates or risk factors of depression in men in the postpartum. There were only four studies that investigated correlates or risk factors of depression during pregnancy in men (Castle et al., 2008; Deater-Deckard et al., 1998; Field et al., 2006; Johnson & Baker, 2004). Furthermore, the studies conducted through pregnancy had only one assessment point (e.g., Areias et al., 1996; Boyce et al., 2007; Condon et al., 2004; Deater-Deckard et al., 1998), and in the postpartum studies there were no more than three assessment points (e.g., Bielawska-Batorowicz & Kossakowska-Petrycka, 2006; Buist et al., 2003; Leathers et al., 1997). This limits the extent to which causal relationships between variables can be studied across time. For a more in-depth discussion of the limitations found across the reviewed studies,
please see the published paper in Chapter 2. This systematic review also revealed that more research on men’s depression during their partner’s pregnancy is needed.

Given that it has been four years since Wee et al.’s (2011) systematic review was published, and that there have been no other systematic reviews published on depression in men during both the ante- and postnatal period, an update of the systematic review (Wee et al., 2011) was undertaken (see Chapter 4). The updated review yielded 11 articles that were relevant for the current review. Of the 11 empirical papers, five adopted a cross-sectional design that focused on paternal depression during the postpartum (Bergström, 2013; Cockshaw et al., 2014; Mao et al., 2011; Nishimura & Ohashi, 2010; Serhan et al., 2013). The remaining six studies were longitudinal in design; one assessed participants antenatally (Skjothaug et al., 2015); three assessed participants antenatally and during the postpartum period (Gawlik et al., 2014; Hanington et al., 2012; Ngai & Ngu, 2015), and the other two assessed participants in the postpartum period only (Don & Mickelson, 2012; Roubinov et al., 2014). When these studies were compared to the studies reviewed by Wee et al. (2011), there were similarities in the correlates found across all studies conducted to date (e.g., poor relationship quality with partner, partner’s depression, perceived stress, social support, unemployment status). Several contradictions were also revealed when comparing the correlates found in the new reviewed studies to correlates found in the studies reviewed by Wee et al. (2011). For example, paternal and maternal depression were found not to be significantly associated in two of the new reviewed studies (Nishimura & Ohashi, 2010; Serhan et al., 2013). However, given that these two studies were cross-sectional, it is possible that an association
between paternal and maternal depression would emerge, as suggested by numerous studies (e.g., Areias et al., 1996; Bradley & Slade, 2011; Deater-Deckard et al., 1998; Matthey et al., 2000; Soliday et al., 1999), later than at the point of their data collection.

Interestingly, new correlates and risk factors were also found in the updated review - a preference for a male baby (Mao et al., 2011), an unintended pregnancy (Nishimura & Ohashi, 2010), infant feeding problems (Cockshaw et al., 2014), low levels of family sense of coherence (Ngai & Ngu, 2015), having fewer biological children, and lower orientation to the Anglo culture (for Mexican American men) (Roubinov et al., 2014). The association between depression in men post-birth and the preference for a male baby (Mao et al., 2011) and an unintended pregnancy (Nishimura & Ohashi, 2010) might be culturally driven as these studies were done in China and Japan. The association between depression in men post-birth and lower orientation to the Anglo culture is also culturally driven. The relationship between infant feeding problems and paternal depression could be explained by fathers feeling a sense of helplessness for being unable to provide direct instrumental support, and thus felt excluded (Mitchell-Box & Braun, 2012). Fathers would often view themselves as the main source of support for their partner and would feel responsible for sharing the childcare load (Boyce et al., 2007; Cockshaw et al., 2014); therefore, the incongruence between the father’s ability to participate and his perception of the ideal father role might exacerbate his levels of depressive symptoms. Ngai and Ngu (2015) argued that parents with a strong family sense of coherence are more prone to experience a sense of certainty, stability and meaningfulness in the family, view the stresses ofparenthood as challenges, and are more driven to use coping resources and seek...
support when facing the stresses of new parenthood, which in turn increase their overall psychological well-being and decrease the risk of postnatal depression. Similar to the findings of Wee et al.’s (2011) systematic review, Roubinov et al. (2014) found that the lack of knowledge/experience would increase distress. Roubinov et al. argued that fathers with fewer biological children have less experiences and knowledge about the challenges that a newborn brings and therefore are less prepared for these challenges, which in turn increase their risk of distress.

Limitations found in the new reviewed studies were similar to the limitations identified in Wee et al.’s (2011) systematic review (i.e., the use of cross-sectional designs in five studies (Bergström, 2013; Cockshaw et al., 2014; Mao et al., 2011; Nishimura & Ohashi, 2010; Serhan et al., 2013), the focus on depression during the postpartum period (Bergström, 2013; Cockshaw et al., 2014; Don & Mickelson, 2012; Mao et al., 2011; Nishimura & Ohashi, 2010; Roubinov et al., 2014; Serhan et al., 2013), and very limited assessment points in the five of the six longitudinal studies (Don & Mickelson, 2012; Gawlik et al., 2014; Hanington et al., 2012; Ngai & Ngu, 2015; Roubinov et al., 2014)).

The second systematic review paper (Wee et al., 2013) that was published, to my knowledge, was the only study that systematically identified and reviewed intervention studies. This review was informed by the PRISMA statement (Moher et al., 2009). Only four articles that were relevant to the review were identified. On reviewing these studies on interventions, the four studies demonstrated very variable outcomes (see Chapter 3 for more details); it is also clear that further randomised controlled trials (RCTs) of interventions are needed to establish efficacious and cost-effective treatment protocols for men.
Given that it has been two years since Wee et al.’s (2013) review was published, and that there have been no other reviews published on studies investigating the effects of interventions designed to prevent or treat depressive symptoms, and/or anxiety and stress, in fathers only or in both fathers and mothers during the perinatal period, an update of Wee et al.’s (2013) review was undertaken (see Chapter 5). A large number of parenting interventions were initially found, however most were designed exclusively for mothers. Only one article (Thome & Arnardottir, 2013) that was relevant for the current review was found. This article together with the four articles found in the second published review were evaluated using the grading and recommendations assessment, development and evaluation (GRADE) approach (Brożek et al., 2009; Guyatt et al., 2011). The focus of the interventions in these studies varied widely. For example, one targeted depression through co-parenting (Feinberg & Kan, 2008), whilst another targeted management of infant sleep problems and parental distress (Thome & Skuladottir, 2005). Also, the findings from these studies were inconsistent. Not all the interventions produced a significant decrease in symptomatology. Of the five studies, only two reported a significant decrease in depressive symptoms in both mothers and fathers (Thome & Arnardottir, 2013; Thome & Skuladottir, 2005) and one a significant decrease in depressive symptoms in mothers but not in fathers (Feinberg & Kan, 2008). Another only reported on significance in mothers and not in fathers even though depressive symptoms were measured in both parents (Hynd et al., 2007). The studies reviewed are limited in terms of design (measurement), inconsistency of findings reported, imprecision (small sample sizes), and publication bias (failure to report findings in one study). These studies, collectively, do not provide a high level of
quality evidence for the reduction of depressive symptoms, anxiety and stress. Using the GRADE approach, the quality of evidence found across these five studies for the reduction of depressive symptoms, anxiety and stress is very low. When considering this low level of quality evidence, it should be noted that only a very small number of studies met the criteria of this review. The small number of studies available for review and their diversity also made comparisons difficult. Therefore it is not possible to draw any conclusive findings or recommendations; there needs to be more research on designing effective intervention programs that not only cater for mothers, but fathers as well in reducing or preventing depression, stress and anxiety.

Collectively, the reviews reveal that, to date, most studies have just explored uni-directional associations between potential correlates and/or risk factors for depression during the ante-and postnatal period in men, with most studies focusing on identifying correlates or risk factors of paternal depression in the postpartum. Studies that were conducted through pregnancy had limited (most only have one collection time point) assessment points during gestation. The reviews also show that there is a lack of effective intervention programs designed to prevent or treat perinatal distress in fathers.

*Empirical Study 1*

The purpose of the first empirical study (Study 1; see Chapter 7) was to examine the inter-relationships between depressive, anxiety and stress symptoms in men during their partner’s pregnancy. Specifically, this study aimed to 1) examine whether depressive symptoms predict anxiety and stress or whether anxiety and stress precede depressive symptoms; 2) examine the stability of
depressive, anxiety and stress symptoms in men during their partner’s pregnancy; 3) to compare findings for men and their partners, and finally 4) to compare findings for first-time fathers and non-first-time fathers given the differences in antenatal mood symptoms between first-time and non-first-time fathers has yet to be explored. Partner’s depression, sleep quality and social support were controlled in all analyses as they have been found to be the most common correlates of both paternal and maternal antenatal depression (e.g., Buist et al., 2003; Castle et al., 2008; Field et al., 2006).

The findings of Study 1 demonstrate that higher levels of paternal anxiety symptoms earlier on in the antenatal period prospectively predicted paternal depressive and stress symptoms around the middle of pregnancy, while higher levels of paternal stress around the middle of pregnancy predicted paternal depressive and anxiety symptoms during the late antenatal period. Anxiety levels were the lowest earlier on in the antenatal period and increased to their highest levels around the middle of pregnancy and remained quite stable until late pregnancy in men. A similar relationship remained after partialling out the effects of partner’s depression, perceived social support, and sleep quality. This suggests that anxiety and stress do contribute to later depressive symptoms over and above the effects of the control variables.

Further analyses also revealed significant differences in the manifestation of distress symptoms between men and women. The findings of Study 1 revealed that men and their partners differed in the association between anxiety symptoms earlier on in pregnancy and depressive and stress symptoms during middle pregnancy, in the association between anxiety symptoms around middle pregnancy and anxiety symptoms during late pregnancy, and in the association
between stress symptoms during middle pregnancy and stress symptoms during late pregnancy. These findings are in accordance with the findings of other previous studies (e.g., Madsen, 2011; Matthey et al., 2000; Wang & Chen, 2006). These results are not surprising given that the symptoms of distress have also been shown to manifest differently in men and women during other life stages (e.g., Brownhill et al., 2002; Grigoriadis & Robinson, 2007; Winkler et al., 2006). However, and against expectations, there were no significant differences in the course of distress between first-time and non-first-time fathers. The reason for not finding this expected difference needs to be investigated further. However, it was suspect that one of the reasons could be due to the participants being predominantly tertiary educated, and thus were better informed about childbirth etc.

Data from Study 1 also revealed that, while the women in the current sample reported quite consistent levels of symptoms across the different subscales of the DASS at each time point (see Table 4 in Chapter 7), the men seemed to report higher levels of stress (6 to 8.7%) as compared to other distress symptoms. This suggests that stress might have a key role in the development of paternal distress as current results showed high levels of stress in middle pregnancy predicting high levels of depressive symptoms in late pregnancy. It is also possible that men might be reluctant to be labelled as “depressed” (e.g., Gaylin, 2000; Heifner, 1997), but they might feel more comfortable admitting to being stressed. It can also be argued that men’s distress affect might not be well represented in diagnostic interviews or self-report measures. For example, Madsen (2011) has found that outbursts of anger, alcohol and substance abuse manifested more frequently in men who were distressed postnatally. The findings
of Study 1 are in accord with this argument as indicated by men reporting higher levels of stress compared to other distress symptoms.

**Empirical Study 2**

The aim of the second empirical study (Study 2; see Chapter 8) was to examine whether men’s distress symptoms at early, mid and late pregnancy predicted their partner’s distress symptoms, whether women’s distress symptoms at early, mid and late pregnancy predicted men’s distress symptoms, and to investigate the moderating effects of both men’s and their partner’s perceived social support on levels of distress symptoms (see Figure 1 & 2 in Chapter 8).

The findings of Study 2 demonstrate, against expectations, that there were no significant reciprocal influences between men and their partner on distress symptomatology. Higher levels of distress in men at each time point did not predict higher levels of distress in their partner at the following time point, and vice versa. However, men’s and their partner’s levels of distress symptoms were correlated at earlier and late pregnancy. This finding is consistent to the findings reported by Field et al. (2006) who found men’s levels of anxiety and depression were correlated to their partner’s depression. Our result is also consistent to the findings of Matthey et al.’s (2003) study that showed when the men in their study met the criteria for depression, anxiety or both, their partner was two to three times more likely to also meet the criteria. Further analyses also revealed that social support did not significantly moderate the relationship between men’s and their partner’s levels of distress symptoms. This finding contradicts the findings of various studies (e.g., Chen et al., 2009; Honey et al., 2003b; Lonergan, 2014; Xu & Wang, 2012; Xu & Wei, 2013) that found social support to have moderated
the effects of psychological symptoms. The reasons for the contradicting results between Study 2 and the findings of other studies need to be investigated further. However, it can be argued that the reasons for the differences in findings can be attributed to the use of different measures of social support, the different types of social support measured, and the different life stages at which social support was measured. These factors could have influenced the moderating effects of social support on distress. Another reason for not finding a significant association between social support and distress, and the lack of reciprocal relationships between men’s and their partner’s distress symptomatology, might be due to the current sample being from a non-clinical population. Results might be different with a clinical sample that have a much higher manifestation of distress symptoms.

However, the findings of Study 2 revealed that low levels of perceived social support in men earlier on in their partner’s pregnancy predicted higher levels of paternal distress earlier on in their partner’s pregnancy. This finding is consistent with previous studies that showed low social support to be positively associated with distress in men during the perinatal period (e.g., Castle et al., 2008; Gao et al., 2009; Leathers et al., 1997; Milgrom et al., 2008a; Wang & Chen, 2006; Wee et al., 2011). This finding is important as Study 2’s results also showed that distress symptoms in men at each time point were predictive of that measure at the following time point. This finding is also consistent with previous studies (e.g., Areias et al., 1996; Matthey et al., 2000; Ramchandani et al., 2008b) that also showed distress symptoms to be predictive of that measure across the perinatal period. Of note, information on social support was only collected at the initial assessment time point and not at other assessment time points. Given that
the results showed that low social support in men did not predict higher levels of paternal distress at any other time points except at baseline, this might indicate that social support might vary across the antenatal period in men.

In Study 2, low perceived social support in women, however, was found to have no significant association with women’s distress across the antenatal period. The difference in the effects of perceived social support on men and women could be explained by the differences in assigning importance to the different types of social support by the gender. In a study that investigated the risk factors of social gratification (positive response to social involvements), support, control at work and in the parenting role, and mood in first-time couples, Leathers et al. (1997) found that support from their bosses and social gratification at work were comparatively less important for men than for women in mediating levels of depression. This might indicate that social support in an individual’s personal life, external to work, is more important for men than for women. Of note, Leathers et al. measured social support in men and women in the postpartum using a modified version of the Social Support Network Inventory (Flaherty et al., 1983) that provides assessment of sources of support from spouse, parents, boss and coworkers, and one additional significant other (a friend or relative). Even though Leathers et al. use a different measure of social support, and assessed their participants at a different period of time (postpartum) as compared to Study 2, Leather et al.’s findings do indicate the differences in assigning importance to the different types of social support by the gender. In Study 2, only data about social support from family, friends and a significant other were collected; no data about social support from other sources were collected. Therefore, the findings of Study 2 suggest that, while low social support might have been found to be a common
risk factor of depression in men and women during the perinatal period in other studies (e.g., Castle et al., 2008; Gao et al., 2009; Leathers et al., 1997; Milgrom et al., 2008a; Wang & Chen, 2006; Wee et al., 2011), the experience of social support might be different in men and women.

Collectively, empirical Study 1 and 2 demonstrated that men do experience distress during their partner’s pregnancy. This is consistent with the findings of Wee et al.’s (2011; 2013) systematic reviews. The findings of these two empirical studies also suggest that distress symptoms experienced by men antenatally may be elevated and related to this significant life stage, and that there might be significant differences in the experience and manifestation of distress symptoms between men and women. Again, this is consistent with the findings of Wee et al.’s (2011; 2013) systematic reviews. The results of Study 1 and 2 further demonstrated that depression, anxiety and stress (distress symptoms) in men have a bi-directional relationship with one another across their partner’s pregnancy, and that distress symptoms are predictive of that measure across the antenatal period. Study 1 further revealed that the development of antenatal distress symptoms in men is multidimensional; and affects mothers and fathers, and first-time fathers and non-first-time fathers differently. What these results suggest is the need to study the development of distress in men during the perinatal period, and its correlates and risk factors using a multidimensional approach. This is especially so for studying the associations between social support and perinatal distress in men. Results from Study 2 suggest that different types of social support affect men and women differently. The results indicated that low social support from friends, family and a significant other affected the distress levels in men earlier on in pregnancy. However, no similar result was found for women
indicating that other types of social support might be more relevant in mitigating the effects of perinatal distress in women. The finding that social support does affect the levels of distress in men earlier on during their partner’s pregnancy is important as social support has been found to moderate the outcomes of the distress, and the appraisal of the stressful events and the use of coping behaviours during the perinatal period (Honey et al., 2003b).

Theoretical and practical implications

One of the major theoretical implications of the findings of this PhD project is that the findings support the argument for using the biopsychosocial perspective as a framework in understanding the processes underlying the development of, and risk factors associated with, paternal distress during the perinatal period. As investigating biological risk factors for depression in men during the perinatal period was beyond the scope of this thesis, this thesis mainly focused on the psychological and social aspects of this model when evaluating the development of elevated distress symptoms through the antenatal period for men. According to the findings of Wee et al.’s (2011; 2013) and the current updated systematic reviews, the risk factors for distress in men during the perinatal period are not just biomedical in nature. For example, having a depressed partner, poor state or quality of the relationship between men and their partner, neuroticism, maladaptive coping, and low social support are found to be associated with distress in men around their partners’ pregnancy and post-birth. From these findings, it is clear that the understanding of distress in men during the antenatal, and postnatal, period must be done through the framework of the biopsychosocial paradigm. Unlike the reductionistic view of the biomedical perspective that
suggest that the underlying cause of all illness or diseases is attributed to a virus, gene or developmental abnormality, or an injury, the biopsychosocial perspective posit that illness, including mental illness, is caused by biological, psychological (thoughts, emotions, and behaviours etc.), and social (socio-economical, socio-environmental, and cultural etc.) factors (Engel, 1977). However the biopsychosocial model is much more than just understanding the causation of illnesses, it is also about how psychological and social risk factors affects how an individual understands his/her illness, and thus affecting the course of treatment of that illness (Engel, 1980). This argument is supported in a meta-analysis of patients’ health beliefs, illness severity and patient adherence to clinical interventions (DiMatteo, Haskard, & Williams, 2007). The findings of this meta-analysis found that patients’ understanding of their illness and its threats, as well as obstacles in the patients’ social or cultural environment, would influence the patients’ health-promoting or treatment behaviours, such as seeking medical interventions, and medication taking (DiMatteo et al., 2007). Thus, the biopsychosocial model also recognises the individual’s subjective experience of an illness as an essential contributor to accurate diagnosis (Borrell-Carrió, Suchman, & Epstein, 2004). With accurate diagnosis, clinicians can provide better treatment care for fathers experiencing perinatal distress, and thus ensuring better health outcomes for the individuals. This is important as reducing psychological distress in fathers would better the psychological outcomes for the mothers and infants as high levels of paternal perinatal distress have been shown to be associated to maternal distress and is detrimental to children’s development (Fletcher et al., 2011; Kane & Garber, 2004; Kaplan et al., 2007; Paulson et al., 2009; Ramchandani et al., 2011). The finding of the systematic reviews is,
therefore, a step towards further understanding the complex relationship between the biopsychosocial risk factors of perinatal paternal distress and the subjective experience of perinatal distress in men.

Another major theoretical implication of the findings of this PhD project is that the findings contribute further to the argument of gender difference in distress during the perinatal period. From the current systematic reviews, it is revealed that the prevalence rate of perinatal distress is different in men than in women. The systematic reviews show that the prevalence rates for depression, as measured by various screening tools, across the perinatal period in women living in high-income countries are reasonably consistent across studies with findings indicating that between 12 and 20% (approximately 10% of pregnant women and 13% who have recently given birth) of women experience depression (with a commonly reported estimate of 13% (period prevalence)). Findings regarding the prevalence rates of non-clinically diagnosed depression for men during their partner’s pregnancy and in the afterbirth have been variable with studies reporting rates that range from 0.7 to 23.8% (antenatal prevalence rates range: 3.9 to 18.2%). Also, the findings of Empirical Study 1 and 2 suggest that there might be significant differences in the experience and manifestation of distress symptoms between men and women. The findings of Study 1 revealed that men and their partners differed in the association between anxiety symptoms earlier on in pregnancy and depressive and stress symptoms during middle pregnancy, in the association between anxiety symptoms around middle pregnancy and anxiety symptoms during late pregnancy, and in the association between stress symptoms during middle pregnancy and stress symptoms during late pregnancy. As mentioned above, these findings are in accordance with the findings of other
previous studies (e.g., Madsen, 2011; Matthey et al., 2000; Wang & Chen, 2006). Brems (1995) argued that the gender differences in the experience of depression could be due to biological (e.g., genes, reproductive-related events in women), social (e.g., social roles, socioeconomic condition), and psychosocial factors (e.g., personality development, spousal abuse). This explanation for the gender differences was also supported by Grigoriadis and Robinson (2007) who suggested that the differences could be attributed to psychological, neurochemical, anatomic, hormonal, genetic, and personality factors. The practical implication for this finding is that treatment of paternal perinatal distress cannot just be generalized from research with women to men. This is important as researchers/clinicians need to design/plan treatment programs for men that is different from those designed for women. In Study 2, the findings revealed that low levels of perceived social support in men earlier on in their partner’s pregnancy were predictive of higher levels of paternal distress earlier on in their partner’s pregnancy. However, the findings revealed that low levels of perceived social support in women earlier on in pregnancy did not predict higher levels of maternal distress earlier on in pregnancy. The difference in the effects of perceived social support on men and women could be explained by the differences in assigning importance to the different types of social support by the gender (Leathers et al., 1997). The practical implication of this is that, while it is important to involve the social networks of men and women in preventing/treating distress during the antenatal period, it is vital to recognise that different types of social support may have different effects on distress in men and women during this period.
General Limitations

There are several methodological limitations of this PhD project. One of the limitations is the use of a convenience sample. The use of a convenience sample can lead to the under-representation or over-representation of particular groups within the sample. In the current sample, the participants were predominantly tertiary educated and earning high family incomes. The manifestation of mood symptoms might be different in a sample from lower educational backgrounds and earning lower family income as the challenges they face might be different. For example, the lack of finances have been shown to be one of the causes of anxiety and stress for fathers (Hanson et al., 2009).

Another limitation is the self-report nature of obtaining data. Self-report nature of obtaining data can have internal validity issue (Hawkshead & Krousel-Wood, 2007). For example, inaccuracy in data can be caused by errors in self-observation, recall bias and social desirability bias of the participants. A further limitation is that no additional risk factors for paternal mental health during the perinatal period were assessed. For instance, the use of maladaptive coping strategies. Research has reported an association between postnatal depression and negative appraisal and maladaptive coping in women (e.g., Honey, Bennett, & Morgan, 2003a; Honey et al., 2003b). The way postnatally depressed mothers appraised and coped with stressful events was found to be different to non-depressed mothers (Honey et al., 2003b). Depressed women were found to be more prone to appraise stressful situations as more threatening and less controllable and were found to use more emotion-focused coping to deal with these situations. This could be true for fathers during the antenatal period.
Another limitation is that historical and developmental variables in the lives of fathers were not measured. In particular, no measurement of the fathers’ own experiences of being parented was done. According to the findings of Wee et al.’s (2013; 2011) reviews, the ways fathers parent their children can have negative effects on their children’s development such as their mental well-being and the ways they form relationships later in life. Therefore, it can be argued that the ways the men in this current PhD project were parented by their own fathers could have had an effect on their mental well-being during the perinatal period.

Lastly, it is not certain that the distress symptoms measured in the current project were specific to the antenatal period. Overall, these limitations may impact the generalisability and clinical application of our results.

Conclusions and Future Research

The overall aim of this thesis was to explore predictors of elevated depressive symptoms in men during their partner’s pregnancy and post-birth. This was achieved via two systematic reviews and two empirical studies. Updates to the two reviews and an evaluation of the effectiveness of current intervention programs that were designed specifically for men who were suffering from depression during the perinatal period was also done. According to the reviews, having a depressed partner, poor state or quality of the relationship between men and their partner, and low social support are the most common correlates of depression in men around their partners’ pregnancy and post-birth. The reviews also highlight that, to date, most studies have just explored uni-directional associations between potential correlates and/or risk factors for depression during the ante-and postnatal period in men, with most studies focusing on identifying
correlates or risk factors of paternal depression in the postpartum. Studies that were conducted through pregnancy had limited (most only have one collection time point) assessment points during gestation. The reviews also show that there is a lack of effective intervention programs designed to prevent or treat perinatal distress in fathers.

In the first empirical study, after accounting for the relative stability of depression, anxiety and stress over time, for men higher levels of anxiety earlier in pregnancy predicted higher levels of depression and stress in middle pregnancy, which predicted higher depression during late pregnancy. A similar relationship remained after partialling out the effects of partner’s depression, perceived social support, and sleep quality. Further analyses also revealed significant differences in the manifestation of distress symptoms between men and women, but not between first-time and non-first-time fathers. Future research should consider exploring the prospective relationships between these variables in the postpartum to determine if the association shown during pregnancy continues. Future research should also investigate what causes men to be vulnerable to the distress symptoms. This in turn could help with the design of prevention/treatment programs which are currently lacking for men experiencing antenatal distress as revealed by my second systematic review on intervention programs.

In the second empirical study, the results revealed that there were no significant reciprocal influences between men and their partner on distress symptomatology. Higher levels of distress in men at each time point did not predict higher levels of distress in their partner at the following time point, and vice versa. However, men’s and their partner’s levels of distress symptoms were
correlated at earlier and late pregnancy. Social support also did not significantly moderate the relationship between paternal and maternal levels of distress. However, paternal distress symptoms at each time point were found to be predictive of that measures at the following time point. Low levels of perceived social support in men earlier on in their partner’s pregnancy were also predictive of higher levels of paternal distress earlier on in their partner’s pregnancy. In contrast, the findings of Study 2 showed that low perceived social support in women had no significant association with women’s distress across the antenatal period. As mentioned above, information on social support was only collected at the initial assessment time point. Future research should collect information on social support in men at various assessment points throughout the antenatal period to determine if the perception of social support in men varies across the antenatal period. Also by collecting more data on social support at other period of time in the antenatal period, the differences in the effects of perceived social support on distress in men and women across the antenatal period could be better studied.
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A partnership between: Ngala - Hey Dad WA, Armadale Community Health Services, ARAFMI- Mental Health Carers and Friends Association, and Gosnells Women’s Health Service.


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with maternal postpartum depression? Population-based study in Brazil. 


Appendices
Appendix A

Memorandum

To: Dr Helen Skouteris

B

cc: Mr Kim Yong Wee

From: Deakin University Human Research Ethics Committee (DU-HREC)

Date: 27 October, 2009

Subject: 2009-159

Health and Wellbeing During Pregnancy and After Birth

Please quote this project number in all future communications

The application for this project was considered at the DU-HREC meeting held on 26/10/2009.

Approval has been given for Mr Kim Yong Wee, under the supervision of Dr Helen Skouteris, to undertake this project from 27/10/2009 to 27/10/2012.

The approval given by the Deakin University Human Research Ethics Committee is given only for the project and for the period as stated in the approval. It is your responsibility to contact the Human Research Ethics Unit immediately should any of the following occur:

- Serious or unexpected adverse effects on the participants
- Any proposed changes in the protocol, including extensions of time.
- Any events which might affect the continuing ethical acceptability of the project.
- The project is discontinued before the expected date of completion.
- Modifications are requested by other HRECs.

In addition you will be required to report on the progress of your project at least once every year and at the conclusion of the project. Failure to report as required will result in suspension of your approval to proceed with the project.

DU-HREC may need to audit this project as part of the requirements for monitoring set out in the National Statement on Ethical Conduct in Human Research (2007).

Human Research Ethics Unit
research-ethics@deakin.edu.au
Telephone: 03 9251 7123
Appendix B

A World’s First Study of Men’s Mental Health and Wellbeing during Pregnancy and Afterbirth

"Are you and your partner expecting a child? Is your partner between 17-18 weeks pregnant? Would you like to contribute to a world first study on the causes and effects of pre- and postnatal depression in men?"

Men and their pregnant partners who are between 12 to 17 weeks gestation are invited to take part in a study that examines the psychological well-being of men and their partners throughout pregnancy and the first 12 months post birth.

This is a confidential study, being conducted by Mr Kim Yong Wee, Dr Helen Skouteris, Dr Ciaran Dier and Dr Ben Richardson from the School of Psychology, Deakin University. The findings of this study will contribute invaluable information to the literature about paternal psychological well-being during pregnancy and the first year post birth.

Participation will entail completing a set of questionnaires at 13, 25, 33 weeks gestation and 6 weeks, 12 weeks, 6 months and 12 months postpartum (you can choose to do the questionnaires online or we can send you hardcopies). While this may sound like a lot, the questionnaires will take less than 20 minutes to complete at each time.

If you are interested in participating in this vital research or would like more information about our study, please contact Mr Kim Yong Wee at kywe@deakin.edu.au

We look forward to hearing from you!
Appendix C

DEAKIN UNIVERSITY
PLAIN LANGUAGE STATEMENT AND CONSENT FORM

TO: Prospective participants

PLAIN LANGUAGE STATEMENT
Date: 15 March, 2010

Full Project Title: Health and Wellbeing during Pregnancy and After Birth

Student Researcher/PhD Candidate: Mr Kim Yong Wee (School of Psychology, Deakin University, Burwood)

Research Investigators/Supervisors: Dr Helen Skouteris, Dr Ciaran Pier and Dr Ben Richardson (School of Psychology, Deakin University, Burwood).

1. Your Consent
You are invited to take part in this research project being conducted by Deakin University.

This Plain Language Statement contains detailed information about the research project. Its purpose is to explain to you as openly and clearly as possible all the procedures involved in this project so that you can make a fully informed decision about whether you are going to participate.

Once you understand what the project is about and if you agree to take part in it, you will be asked to sign the Consent Form. By signing the Consent Form, you indicate that you understand the information and that you give your consent to participate in the research project. Please do this prior to completing the questionnaires.

You will be given a copy of the Plain Language Statement and Consent Form to keep as a record.

2. Purpose and Background
Research indicates that up to 15% of women will suffer an episode of postnatal depression in the six months following childbirth and there appears to be a link between antenatal anxiety and postnatal depression in expectant women. Additional recent research has indicated that men are affected by antenatal and postnatal anxiety and depression as well. It was also found that the rate of diagnosed anxiety or depressive disorders in new fathers at six weeks postpartum was around 2% - 5%. Research has also found that the antenatal rather than the postnatal period was more stressful for fathers.

Whilst, current research reports that postnatal depression in fathers has serious long term negative implications for the development of their child, the risk factors for postnatal depression in men remain largely unknown. Given that the antenatal period is particularly stressful for fathers, and that antenatal anxiety
predicts postnatal depression in women it is important to examine potential risk factors for males across the antenatal and postnatal period.

The aim of this research, therefore, is to identify factors that might predict men’s antenatal and postnatal depression. Anxiety, stress and depression will be examined in men during the entire pregnancy and the first year postpartum. Data will be collected from 250 men and 250 women concurrently and prospectively at regular intervals through pregnancy and postpartum (18, 25, 33 weeks gestation and 6 weeks, 12 weeks, 6 months and 12 months postpartum) so as to examine if risk factors in women is related or will affect men.

3. Funding
This project is being funded through a student PhD budget provided by the School of Psychology, Deakin University.

4. Procedure
If you agree to participate, you will be required to complete a short series of questionnaires at 18, 25, 33 weeks gestation and 6 weeks, 12 weeks, 6 months and 12 months postpartum. While this may sound like a lot, most of the questionnaires will take approximately 15-20 minutes to complete and will include questions about parental and infant health and wellbeing as well as demographic information such as age and family income.

Examples of questions that will be asked are “I found it difficult to relax” and “In the past 7 days I have been able to laugh and see the funny side of things”. Participants will receive all the questionnaires in the mail and will be asked to return these to the University using the reply paid envelopes which will be provided.

5. Possible Benefits
By participating in the current project, you will be making an invaluable impact in the perinatal and postnatal health area by contributing to a very important area of research. Your participation will help researchers and clinicians to better understand the factors that contribute to the development of paternal depression during their partner’s pregnancy and the postpartum and its consequences, with implications for multiple health professionals and the wider community. Your results will potentially help to identify factors of pre- and postnatal depression in men which is currently an area in which research is lacking. Also new intervention programs targeting pre- and postnatal depression in men may be a result of this research.

6. Possible Risks
There are no anticipated risks outside the normal day-to-day activities. However, given that the questionnaires will include questions regarding issues such as anxiety, depression and stress, there is a slight possibility that you may experience some concern about your responses. Thus, you are invited to examine the questionnaire material before agreeing to participate. If you do participate and find that you are uncomfortable or overly worried about your responses to any of the questionnaire items, or if you find participation in the project distressing, you should contact Kim Yong Wee on 03 9251-7817 as soon as convenient. You will have the opportunity to discuss your concerns in a confidential manner and appropriate follow-up will be suggested if necessary.
If considerable distress is revealed in the data obtained by the Researchers during the course of the study, you will be contacted by the Student Researcher and referred to someone who can be of assistance. Please be aware that there will be a delay between receiving your responses and the analysis of the information you provide. In turn, if you find yourself feeling sad or distressed at any point, you are encouraged to contact your GP and/or obstetrician.

7. Privacy, Confidentiality and Disclosure of Information

You can be assured that you will not be identified by name in any way in the reporting of our results in publications and conference presentation. Any information we collect from you that can identify you will remain confidential and will be stored in a locked cabinet within the School of Psychology at Deakin University for a minimum of 6 years from the date of publication.

8. Results of Project

A summary of the findings will be provided to the school and available for any interested participants to read at the completion of the study. Please email kywe@deakin.edu.au if you would like to receive a copy of this report.

9. Participation is voluntary

Participation in any research project is voluntary. If you do not wish to take part you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage. Any information obtained from you to date will not be used and will be destroyed. Your decision whether to take part or not to take part, or to take part and then withdraw, will not affect your relationship with Deakin University in any way.

Before you make your decision, a member of the research team will be available to answer any questions you have about the research project. You can ask for any information you want. Sign the Consent Form only after you have had a chance to ask your questions and have received satisfactory answers.

If you decide to withdraw from this project, please notify a member of the research team so they can inform you if there are any special requirements linked to withdrawing.

10. Ethical Guidelines

The study will be carried out in accordance with the National Statement on Ethical Conduct in Human Research (2007). This statement has been developed to protect the interests of people who agree to participate in human research studies.

The ethical aspects of this research project have been approved by the Human Research Ethics Committee of Deakin University. The research will be carried out in the School of Psychology Deakin University, 221 Burwood Highway, Burwood Victoria.

11. Complaints

Should you have any concerns about the conduct of this research project, please contact the Manager, Research Integrity, Research Services Division, Deakin University, 221 Burwood Highway, Burwood Victoria, 3125. Telephone:
12. Reimbursement for your costs
   You will not be paid for your participation in this project.

13. Further Information:
   Contact Kim Yong Wee in the School of Psychology, Deakin University,
   221 Burwood Highway, Burwood, Victoria, 3125, on 03 9251-7817 or email:
   kywe@deakin.edu.au
TO: Participants

Consent Form
Researcher's Copy

Date: 15 March, 2010

Full Project Title: Health and Wellbeing during Pregnancy and After Birth

Researchers: Mr Kim Yiong Wee, Dr Helen Skouteris, Dr Ciaran Pier and Dr Ben Richardson (School of Psychology, Deakin University, Burwood).

I have read and I understand the attached Plain Language Statement.

I freely consent to participate in this project according to the conditions in the Plain Language Statement.

I have been given a copy of the Plain Language Statement and Consent Form to keep.

The researchers have agreed not to reveal my identity and personal details, including where information about this project is published, or presented in any public form.

Participant’s Name (Printed)
……………………………………………………………………………………………….

Participant’s Signature……………………………………………………..Date…………………..

Participant’s Contact Details
Address:
………………………………………………………………………………………………
………………………………………………………………………………………………
……………….
Home Phone: ……………………………………………………………………….
Mobile: ……………………………………………………………………………
Email Address: ……………………………………………………………………….

The researchers will be applying for further funding to continue their research longer term. If you agree to be contacted for research studies of this type in the future please sign below.
I consent to the researchers named here contacting me for future research studies that I am not obliged to take part in.

Participant's name: ........................................................ Signature:

Please **return** the signed form to: **Mr Kim Yiong Wee, School of Psychology, Deakin University, 221 Burwood Highway, Burwood, Victoria 3125.**
TO: Participants

Consent Form
Participant's Copy

Date: 15 March, 2010

Full Project Title: Health and Wellbeing during Pregnancy and After Birth

Researchers: Mr Kim Yiong Wee, Dr Helen Skouteris, Dr Ciaran Pier and Dr Ben Richardson (School of Psychology, Deakin University, Burwood).

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Participant’s Name (Printed)
........................................................................................................................................

Participant’s Signature..........................................................Date....................................

Participant’s Contact Details

Address:
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
............

Home Phone: ...........................................................

Mobile: ...........................................................

Email Address: ...........................................................

The researchers will be applying for further funding to continue their research longer term. If you agree to be contacted for research studies of this type in the future please sign below.
I consent to the researchers named here contacting me for future research studies that I am not obliged to take part in.

Participant’s name: .................................................. Signature: ................................................

Please keep this signed form for your records.
Appendix D

Cover Letter to Participant

School of Psychology
Deakin University
221 Burwood Highway
Burwood, Victoria 3125

Hello and welcome to our study: “Health and Wellbeing during Pregnancy and After Birth”.

We would like to thank you for agreeing to take part in this study. Your participation will help researchers better understand the general experiences of men and women during pregnancy and the first 12 months following birth. The project aims to provide some insight into questions regarding the level and type of distress experienced by men and women across pregnancy and the first postpartum year, and whether any ‘critical periods’ can be identified where early intervention may be most effective.

The present questionnaire pack should take approximately 20 minutes to complete. If you begin filling out the questionnaires and feel you do not wish to continue further you can stop. If the questionnaires raise personal concerns for you, you can call Mr Kim Yong WEE (Alvin) on 9251-7817 or Dr Helen Skouteris on 9251-7699 to discuss these concerns.

Please fill in the questionnaires as accurately as possible and return them in the reply paid envelope provided. All your responses will remain strictly anonymous and confidential.

Yours Sincerely,
The Research Team

PhD (Psych) Candidate: Kim Yong WEE (Alvin)

Principal Researchers: Dr Helen Skouteris, Dr Ciaran Pier and Dr Ben Richardson
Father’s Information
To Be Completed By Father

The following questions ask for information about you and your spouse. All responses are strictly confidential.

Please add the date you are filling in this questionnaire below and then answer the following questions with your current pregnancy in mind. Please circle the appropriate responses.

Today’s date: ……….. ……….. ……….. ……….. ……….. ………..

1. Your date of birth (dd/mm/yyyy) …………………………………………………

2. Home Phone Number ……………………………………………………………

3. Mobile Phone Number ……………………………………………………………

4. Your child’s (expected) date of birth (dd/mm/yyyy)…………………………

5. What is your weight and height? If you do not have scales at home, your local pharmacy or GP will have scales that you can use to weigh yourself

Weight: ………………………………. kg
Height: …………………………………cm

6. Your occupation is: …………………………………………………………………

8. Number of children you have: (1) (2) (3) (4) (5) (6+) …………..

9. This pregnancy is child number: ………………… (1 = first born; 2 = second born etc.).


11. Are you an Aboriginal or Torres Strait Islander? (1) Yes (2) No
12. Location of your birth:  
(1) Australia  
(2) New Zealand  
(3) North-West Europe  
(4) North America  
(5) Southern & Eastern Europe  
(6) South America  
(7) North Africa & Middle East  
(8) Southern & Central Asia  
(9) Central, Western & Southern Africa

13. Where were your parents born? (Name of country please):  
Father: ........................................  Mother: .............................................

14. Main language spoken at home:  
(1) English  
(2) Other (please specify): .................................................................

15. Please indicate the highest level of education you have completed.  
(1) Still at secondary school  
(2) Did not finish secondary school  
(3) Year 12 or equivalent  
(4) Certificate Level  
(5) Advanced Diploma/Diploma  
(6) Graduate Diploma/Graduate Certificate  
(7) Bachelor Degree Certificate  
(8) Postgraduate Degree

16. Are you currently in paid employment?  
(1) YES  (2) NO  
(If No, please go to the Question 20)  
If Yes, do you work full time/part time? .................................................  
What is your role at work? ......................................................................

17. Please indicate your approximate annual family income:  
(1) Under 25,000  
(2) 25,001- 45,000  
(3) 45,001- 85,000  
(4) 85,001- 125,000  
(5) 125,001- 145,000  
(6) Over 145,001

18. Please provide the postal code that you are currently residing in. ..............................................
19. Are you currently receiving any of the following? (please circle all that apply)

(1) Counselling or psychological therapy

   If yes, how frequently?
   
   (a) Once (i.e., single visit)
   (b) Occasionally (i.e., once a month, or every few months)
   (c) Regularly (weekly or fortnightly). If so, for how long? 

(2) Antidepressants

(3) Other medication (please specify): 

(4) Herbal or natural remedies

(5) Other (please specify): 

(6) None of the above
**Please tick ONE set of brackets for each statement** below which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Did not apply to me</th>
<th>Some degree / Some of the time</th>
<th>Considerable degree / Most of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  I found myself getting upset by quite trivial things</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2  I was aware of dryness of my mouth</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3  I couldn't seem to experience any positive feeling at all</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>4  I experienced breathing difficulty</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>(eg, excessively rapid breathing, breathlessness in the absence of physical exertion)</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>5  I just couldn't seem to get going</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>6  I tended to over-react to situations</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>7  I had a feeling of shakiness (eg, legs going to give way)</td>
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<td>( )</td>
<td>( )</td>
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<tr>
<td>8  I found it difficult to relax</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>9  I found myself in situations that made me so anxious I was most relieved when they ended</td>
<td>( )</td>
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<tr>
<td>10 I felt that I had nothing to look forward to</td>
<td>( )</td>
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<td>( )</td>
</tr>
<tr>
<td>11 I found myself getting upset rather easily</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>12 I felt that I was using a lot of nervous energy</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>13 I felt sad and depressed</td>
<td>( )</td>
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<td>( )</td>
</tr>
<tr>
<td>14 I found myself getting impatient when I was delayed in any way (eg, lifts, traffic lights, being kept waiting)</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>15 I had a feeling of faintness</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>16 I felt that I had lost interest in just about Everything</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>17 I felt I wasn't worth much as a person</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>18 I felt that I was rather touchy</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td></td>
<td>Did not apply to me</td>
<td>Some degree / some of the time</td>
<td>Considerable degree / most of the time</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>19</td>
<td>I perspired noticeably (e.g., hands sweaty) in the absence of high temperatures or physical exertion</td>
<td>( ) ( ) ( ) ( ) ( )</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>I felt scared without any good reason</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td>21</td>
<td>I felt that life wasn't worthwhile</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td>22</td>
<td>I found it hard to wind down</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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</tr>
<tr>
<td>23</td>
<td>I had difficulty in swallowing</td>
<td>( ) ( ) ( ) ( ) ( )</td>
<td></td>
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<tr>
<td>24</td>
<td>I couldn't seem to get any enjoyment out of the things I did</td>
<td>( ) ( ) ( ) ( ) ( )</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)</td>
<td>( ) ( ) ( ) ( ) ( )</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>I felt down-hearted and blue</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td>27</td>
<td>I found that I was very irritable</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td>28</td>
<td>I felt I was close to panic</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td>29</td>
<td>I found it hard to calm down after something upset me</td>
<td>( ) ( ) ( ) ( ) ( )</td>
<td></td>
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<tr>
<td>30</td>
<td>I feared that I would be &quot;thrown&quot; by some trivial but unfamiliar task</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td>31</td>
<td>I was unable to become enthusiastic about anything</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td>32</td>
<td>I found it difficult to tolerate interruptions to what I was doing</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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</tr>
<tr>
<td>33</td>
<td>I was in a state of nervous tension</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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</tr>
<tr>
<td>34</td>
<td>I felt I was pretty worthless</td>
<td>( ) ( ) ( ) ( ) ( )</td>
<td></td>
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<tr>
<td>35</td>
<td>I was intolerant of anything that kept me from getting on with what I was doing</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td>36</td>
<td>I felt terrified</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td>37</td>
<td>I could see nothing in the future to be hopeful about</td>
<td>( ) ( ) ( ) ( ) ( )</td>
<td></td>
</tr>
</tbody>
</table>
The following questions ask about how much you have experienced certain things in the last two weeks. If you have experienced these things an extreme amount, tick in the bracket below "Extremely". If you have not experienced these things at all, tick in the bracket below "Not at all". Questions refer to the last two weeks.

1. How well are your sexual needs fulfilled?

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Slightly</th>
<th>Moderately</th>
<th>Very much</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>( )</td>
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</tr>
</tbody>
</table>

2. Are you bothered by any difficulties in your sex life?

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Slightly</th>
<th>Moderately</th>
<th>Very much</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

The following question asks you to say how satisfied, happy or good you have felt about your sex life over the last two weeks. Please tick ONE set of brackets for each statement that best fits how satisfied or dissatisfied you have felt in the last two weeks.

3. How satisfied are you with your sex life?

<table>
<thead>
<tr>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>( )</td>
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</tbody>
</table>

How would you rate your sex life?

<table>
<thead>
<tr>
<th>Very poor</th>
<th>Poor</th>
<th>Neither poor nor good</th>
<th>Good</th>
<th>Very good</th>
</tr>
</thead>
<tbody>
<tr>
<td>( )</td>
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</table>
We are interested in how you feel about the following statements. Read each statement carefully. Please tick ONE set of brackets for each statement that best indicates how you feel.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Very Strongly Disagree</th>
<th>Strongly Disagree</th>
<th>Militarily Disagree</th>
<th>Neutral</th>
<th>Militarily Agree</th>
<th>Strongly Agree</th>
<th>Very Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. There is a special person who is around when I am in need.</td>
<td>( )</td>
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<tr>
<td>2. There is a special person with whom I can share my joys and sorrows.</td>
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<tr>
<td>3. My family really tries to help me.</td>
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<tr>
<td>4. I get the emotional help and support I need from my family.</td>
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<tr>
<td>5. I have a special person who is a real source of comfort to me.</td>
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</tr>
<tr>
<td>6. My friends really try to help me.</td>
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<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>7. I can count on my friends when things go wrong.</td>
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<tr>
<td>8. I can talk about my problems with my family.</td>
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</tr>
<tr>
<td>9. I have friends with whom I can share my joys and sorrows.</td>
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<tr>
<td>10. There is a special person in my life who cares about my feelings.</td>
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<tr>
<td>11. My family is willing to help me make decisions.</td>
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</tr>
<tr>
<td>12. I can talk about my problems with my friends.</td>
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</tr>
</tbody>
</table>
Fill in the following and circle "AM" if you complete this part of the questionnaire before 12:00pm or "PM" if you complete this part of the questionnaire after 12:00pm.

Date: ___________________ Time ___________________ AM

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, what time have you usually gone to bed at night?
   BED TIME __________

2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?
   NUMBER OF MINUTES __________

3. During the past month, what time have you usually gotten up in the morning?
   GETTING UP TIME __________

4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.)
   HOURS OF SLEEP PER NIGHT __________

Please tick ONLY one set of brackets for each of the remaining questions, that represents your experiences in the past month. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you . . .

   a) Cannot get to sleep within 30 minutes
   Not during the past month ( ) Less than once a week ( ) Once or twice a week ( ) Three or more times a week ( )

   b) Wake up in the middle of the night or early morning
   Not during the past month ( ) Less than once a week ( ) Once or twice a week ( ) Three or more times a week ( )

   c) Have to get up to use the bathroom
   Not during the past month ( ) Less than once a week ( ) Once or twice a week ( ) Three or more times a week ( )

   d) Cannot breathe comfortably
   Not during the past month ( ) Less than once a week ( ) Once or twice a week ( ) Three or more times a week ( )

   e) Cough or snore loudly
   Not during the past month ( ) Less than once a week ( ) Once or twice a week ( ) Three or more times a week ( )
1) Feel too cold

<table>
<thead>
<tr>
<th>Not during the past month</th>
<th>Less than once a week</th>
<th>Once or twice a week</th>
<th>Three or more times a week</th>
</tr>
</thead>
</table>

2) Feel too hot

<table>
<thead>
<tr>
<th>Not during the past month</th>
<th>Less than once a week</th>
<th>Once or twice a week</th>
<th>Three or more times a week</th>
</tr>
</thead>
</table>

3) Had bad dreams

<table>
<thead>
<tr>
<th>Not during the past month</th>
<th>Less than once a week</th>
<th>Once or twice a week</th>
<th>Three or more times a week</th>
</tr>
</thead>
</table>

4) Have pain

<table>
<thead>
<tr>
<th>Not during the past month</th>
<th>Less than once a week</th>
<th>Once or twice a week</th>
<th>Three or more times a week</th>
</tr>
</thead>
</table>

5) Other reason(s), please describe

---

How often during the past month have you had trouble sleeping because of this?

<table>
<thead>
<tr>
<th>Not during the past month</th>
<th>Less than once a week</th>
<th>Once or twice a week</th>
<th>Three or more times a week</th>
</tr>
</thead>
</table>

6. During the past month, how would you rate your sleep quality overall?

<table>
<thead>
<tr>
<th>Very good</th>
<th>Fairly good</th>
<th>Fairly bad</th>
<th>Very bad</th>
</tr>
</thead>
</table>

7. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?

<table>
<thead>
<tr>
<th>Not during the past month</th>
<th>Less than once a week</th>
<th>Once or twice a week</th>
<th>Three or more times a week</th>
</tr>
</thead>
</table>

8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

<table>
<thead>
<tr>
<th>Not during the past month</th>
<th>Less than once a week</th>
<th>Once or twice a week</th>
<th>Three or more times a week</th>
</tr>
</thead>
</table>
9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

- No problem at all ( )
- Only a very slight problem ( )
- Somewhat of a problem ( )
- A very big problem ( )

10. Do you have a bed partner or roommate?

- No bed partner or roommate ( )
- Partner/roommate in other room ( )
- Partner in same room, but not same bed ( )
- Partner in same bed ( )

If you have a roommate or bed partner, ask him/her how often in the past month you have had . . .

a) Loud snoring

- Not during the past month ( )
- Less than once a week ( )
- Once or twice a week ( )
- Three or more times a week ( )

b) Long pauses between breaths while asleep

- Not during the past month ( )
- Less than once a week ( )
- Once or twice a week ( )
- Three or more times a week ( )

c) Legs twitching or jerking while you sleep

- Not during the past month ( )
- Less than once a week ( )
- Once or twice a week ( )
- Three or more times a week ( )

d) Episodes of disorientation or confusion during sleep

- Not during the past month ( )
- Less than once a week ( )
- Once or twice a week ( )
- Three or more times a week ( )

e) Other restlessness while you sleep; please describe

- Not during the past month ( )
- Less than once a week ( )
- Once or twice a week ( )
- Three or more times a week ( )
The following are ways people react to various difficult, stressful, or upsetting situations. Read each statement carefully. Please pick ONE set of brackets for each statement that best indicates how much you engage in these types of activities when you encounter a difficult, stressful, or upsetting situation.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not at all</th>
<th>Some of the time</th>
<th>Half of the time</th>
<th>Good part of time</th>
<th>Most of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Schedule my time better.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>2. Focus on the problem and see how I can solve it.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>3. Think about the good times I've had.</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>4. Try to be with other people.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>5. Blame myself for procrastinating.</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>6. Do what I think is best.</td>
<td>( )</td>
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</tr>
<tr>
<td>7. Become preoccupied with aches and pains.</td>
<td>( )</td>
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<tr>
<td>8. Blame myself for having gotten into this situation.</td>
<td>( )</td>
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<tr>
<td>9. Window shop.</td>
<td>( )</td>
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<tr>
<td>10. Outline my priorities.</td>
<td>( )</td>
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</tr>
<tr>
<td>11. Try to go to sleep.</td>
<td>( )</td>
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</tr>
<tr>
<td>12. Treat myself to a favourite food or snack.</td>
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<tr>
<td>13. Feel anxious about not being able to cope.</td>
<td>( )</td>
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<tr>
<td>14. Become very tense.</td>
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<tr>
<td>15. Think about how I solved similar problems.</td>
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<tr>
<td>16. Tell myself that it is really not happening to me.</td>
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<tr>
<td>17. Blame myself for being too emotional about the situation.</td>
<td>( )</td>
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<tr>
<td>18. Go out for a snack or meal.</td>
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<tr>
<td>19. Become very upset.</td>
<td>( )</td>
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<tr>
<td>20. Buy myself something.</td>
<td>( )</td>
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<tr>
<td>21. Determine a course of action and follow it.</td>
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<tr>
<td>22. Blame myself for not knowing what to do.</td>
<td>( )</td>
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<tr>
<td>23. Go to a party.</td>
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<tr>
<td>24. Work to understand the situation.</td>
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<tr>
<td>25. “Freeze” and not know what to do.</td>
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<tr>
<td>26. Take corrective action immediately.</td>
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<tr>
<td>27. Think about the event and learn from my mistakes.</td>
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</tr>
<tr>
<td>28. Wish that I could change what had happened or how I felt.</td>
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<tr>
<td>29. Visit a friend.</td>
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<tr>
<td>30. Worry about what I am going to do.</td>
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<tr>
<td>31. Spend time with a special person.</td>
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<tr>
<td>32. Go for a walk.</td>
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</tr>
<tr>
<td>33. Tell myself that it will never happen again.</td>
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</tr>
<tr>
<td>34. Focus on my general inadequacies.</td>
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<tr>
<td>35. Talk to someone whose advice I value.</td>
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<tr>
<td>36. Analyse the problem before reacting.</td>
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<tr>
<td>37. Phone a friend.</td>
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<tr>
<td>38. Get angry.</td>
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<tr>
<td>39. Adjust my priorities.</td>
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<tr>
<td>40. See a movie.</td>
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<tr>
<td>41. Get control of the situation.</td>
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<tr>
<td>42. Make an extra effort to get things done.</td>
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<tr>
<td>43. Come up with several different solutions to the problem.</td>
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<tr>
<td>44. Take some time off and get away from the situation.</td>
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<tr>
<td>45. Take it out on other people.</td>
<td>( )</td>
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</tr>
<tr>
<td>46. Use the situation to prove that I can do it.</td>
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</tr>
<tr>
<td>47. Try to be organised so I can be on top of the situation.</td>
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<tr>
<td>48. Watch TV.</td>
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</tr>
</tbody>
</table>
Below are phrases describing people's behaviours. Please read each statement carefully, and then indicate how accurately each statement describes you by placing a tick in one set of brackets for each statement. Please describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Very Inaccurate</th>
<th>Moderately Inaccurate</th>
<th>Neither Inaccurate nor Accurate</th>
<th>Moderately Accurate</th>
<th>Very Accurate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ... I get stressed out easily.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>2. ... I am relaxed most of the time.</td>
<td>( )</td>
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</tr>
<tr>
<td>3. ... I worry about things.</td>
<td>( )</td>
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</tr>
<tr>
<td>4. ... I seldom feel blue.</td>
<td>( )</td>
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</tr>
<tr>
<td>5. ... I am easily disturbed.</td>
<td>( )</td>
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</tr>
<tr>
<td>6. ... I get upset easily.</td>
<td>( )</td>
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</tr>
<tr>
<td>7. ... I change my mood a lot.</td>
<td>( )</td>
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</tr>
<tr>
<td>8. ... I have frequent mood swings.</td>
<td>( )</td>
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</tr>
<tr>
<td>9. ... I get irritated easily.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
</tr>
<tr>
<td>10. ... I often feel blue.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
</tr>
</tbody>
</table>
Appendix E

Cover Letter to Participant

School of Psychology
Deakin University
221 Burwood Highway
Burwood, Victoria 3125

Hello and welcome to our study: “Health and Wellbeing during Pregnancy and After Birth”.

We would like to thank you for agreeing to take part in this study. Your participation will help researchers better understand the general experiences of men and women during pregnancy and the first 12 months following birth. The project aims to provide some insight into questions regarding the level and type of distress experienced by men and women across pregnancy and the first postpartum year, and whether any ‘critical periods’ can be identified where early intervention may be most effective.

The present questionnaire pack should take approximately 10 minutes to complete. If you begin filling out the questionnaires and feel you do not wish to continue further you can stop. If the questionnaires raise personal concerns for you, you can call Mr Kim Yong WEE (Alvin) on 9251-7817 or Dr Helen Skouteris on 9251-7699 to discuss these concerns.

Please fill in the questionnaires as accurately as possible and return them in the reply paid envelope provided. All your responses will remain strictly anonymous and confidential.

Yours Sincerely,
The Research Team

PhD (Psych) Candidate: Kim Yong WEE (Alvin)

Principal Researchers: Dr Helen Skouteris, Dr Ciaran Pier and Dr Ben Richardson
Mother’s Information  
To Be Completed By Mother

The following questions ask for information about you and your spouse. All responses are strictly confidential.

Please add the date you are filling in this questionnaire below and then answer the following questions with your current pregnancy in mind. Please circle the appropriate responses.

Today’s date: ..............

1. Your date of birth (dd/mm/yyyy) .................................................
2. Home Phone Number .................................................................
3. Mobile Phone Number ..............................................................

4. Your child’s (expected) date of birth (dd/mm/yyyy) ............................

5. What is your weight and height? If you do not have scales at home, your local pharmacy or GP will have scales that you can use to weigh yourself

Weight: ................................................. kg
Height: .................................................cm

6. Your occupation is: ........................................................................

7. Number of children you have: (1) (2) (3) (4) (5) (6+)

8. This pregnancy is child number: .................. (1 = first born; 2 = second born etc).

9. Current marital status: (1) Married (2) Divorced
(3) De Facto (4) Separated
(5) Widowed (6) Never Married

10. Are you an Aboriginal or Torres Strait Islander? (1) Yes (2) No
12. **Location of your birth:**
   (1) Australia  (2) New Zealand
   (3) North-West Europe  (4) North America
   (5) Southern & Eastern Europe  (6) South America
   (7) North Africa & Middle East  (8) Southern & Central Asia
   (9) Central, Western & Southern Africa

13. **Where were your parents born? (Name of country please):**
   Father: ...........................................  Mother: ...........................................

14. **Main language spoken at home:**
   (1) English
   (2) Other (please specify): .................................................................

15. **Please indicate the highest level of education you have completed.**
   (1) Still at secondary school  (2) Did not finish secondary school
   (3) Year 12 or equivalent  (4) Certificate Level
   (5) Advanced Diploma/Diploma  (6) Graduate Diploma/Graduate Certificate
   (7) Bachelor Degree Certificate  (8) Postgraduate Degree

16. **Are you currently in paid employment?**
    (1) YES  (2) NO
    (If No, please go to the Question 19)
    If Yes, do you work full time/part time? ............................................
    What is your role at work? ....................................................................

17. **Please indicate your approximate annual family income:**
   (1) Under 25,000  (2) 25,001- 45,000
   (3) 45,001- 65,000  (4) 65,001- 85,000
   (5) 85,001- 105,000  (6) 105,001- 125,000
   (7) 125,001- 145,000  (8) Over 145,001

18. **Please provide the postal code that you are currently residing in.**  ...................................
19. Are you currently receiving any of the following? (please circle all that apply)

(1) Counselling or psychological therapy
   
   If yes, how frequently?
   
   (a) Once (i.e., single visit)
   
   (b) Occasionally (i.e., once a month, or every few months)
   
   (c) Regularly (weekly or fortnightly). If so, for how long? ……………………..

(2) Antidepressants

(3) Other medication (please specify): …………………………………………

(4) Herbal or natural remedies

(5) Other (please specify): ………………………………………………………

(6) None of the above
Please tick ONE set of brackets for each statement below which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Did not apply to me</th>
<th>Some degree / Some of the time</th>
<th>Considerable degree / Most of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 I found myself getting upset by quite trivial things</td>
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<td>19</td>
<td>I perspired noticeably (eg, hands sweaty) in the</td>
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<td></td>
<td>absence of high temperatures or physical</td>
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<td></td>
<td>exertion</td>
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<td>22</td>
<td>I found it hard to wind down</td>
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<td>23</td>
<td>I had difficulty in swallowing</td>
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<td>24</td>
<td>I couldn't seem to get any enjoyment out of the things I did</td>
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<td>25</td>
<td>I was aware of the action of my heart in the</td>
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<td></td>
<td>absence of physical exertion (eg, sense of</td>
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<td></td>
<td>heart rate increase, heart missing a beat)</td>
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<td>26</td>
<td>I felt down-hearted and blue</td>
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<td>27</td>
<td>I found that I was very irritable</td>
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<td>28</td>
<td>I felt I was close to panic</td>
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<td>29</td>
<td>I found it hard to calm down after something upset me</td>
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<td>30</td>
<td>I feared that I would be &quot;thrown&quot; by some trivial</td>
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<td>But unfamiliar task</td>
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<td>31</td>
<td>I was unable to become enthusiastic about</td>
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<td></td>
<td>Anything</td>
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<td>32</td>
<td>I found it difficult to tolerate interruptions to</td>
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<td></td>
<td>what I was doing</td>
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<td>33</td>
<td>I was in a state of nervous tension</td>
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<td>34</td>
<td>I felt I was pretty worthless</td>
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<td>35</td>
<td>I was intolerant of anything that kept me from</td>
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<td></td>
<td>getting on with what I was doing</td>
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<tr>
<td>36</td>
<td>I felt terrified</td>
<td></td>
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<tr>
<td>37</td>
<td>I could see nothing in the future to be hopeful ken &quot;</td>
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</tbody>
</table>
|    | About
38 I felt that life was meaningless

39 I found myself getting agitated

40 I was worried about situations in which I might panic and make a fool of myself

41 I experienced trembling (e.g., in the hands)

42 I found it difficult to work up the initiative to do things

We are interested in how you feel about the following statements. Read each statement carefully. Please tick ONE set of brackets for each statement that best indicates how you feel.

1. There is a special person who is around when I am in need. ( ) ( ) ( ) ( ) ( ) ( ) ( )

2. There is a special person with whom I can share my joys and sorrows. ( ) ( ) ( ) ( ) ( ) ( ) ( )

3. My family really tries to help me. ( ) ( ) ( ) ( ) ( ) ( ) ( )

4. I get the emotional help and support I need from my family. ( ) ( ) ( ) ( ) ( ) ( ) ( )

5. I have a special person who is a real source of comfort to me. ( ) ( ) ( ) ( ) ( ) ( ) ( )

6. My friends really try to help me. ( ) ( ) ( ) ( ) ( ) ( ) ( )

7. I can count on my friends when things go wrong. ( ) ( ) ( ) ( ) ( ) ( ) ( )

8. I can talk about my problems with my family. ( ) ( ) ( ) ( ) ( ) ( ) ( )
9. I have friends with whom I can share my joys and sorrows.

10. There is a special person in my life who cares about my feelings.

11. My family is willing to help me make decisions.

12. I can talk about my problems with my friends.

---

Fill in the following and circle "AM" if you complete this part of the questionnaire before 12:00pm or "PM" if you complete this part of the questionnaire after 12:00pm.

Date: ___________ Time: ___________ PM

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, what time have you usually gone to bed at night?
   BED TIME __________

2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?
   NUMBER OF MINUTES __________

3. During the past month, what time have you usually gotten up in the morning?
   GETTING UP TIME __________

4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.)
   HOURS OF SLEEP PER NIGHT __________

Please tick ONE set of brackets for each of the remaining questions, that represents your experiences in the past month. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you . . .
   a) Cannot get to sleep within 30 minutes.

   Not during the past month ( ) Once or twice a week ( ) Three or more times a week ( )
b) Wake up in the middle of the night or early morning

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Past Month</th>
<th>Once a Week</th>
<th>More than Once a Week</th>
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<tbody>
<tr>
<td>Not during</td>
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<td>Three or more times a week</td>
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<td>past month</td>
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c) Have to get up to use the bathroom

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d) Cannot breathe comfortably

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</table>

e) Cough or snore loudly

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f) Feel too cold

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g) Feel too hot

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h) Had bad dreams

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i) Have pain

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j) Other reason(s), please describe

__________________________

How often during the past month have you had trouble sleeping because of this?

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6. During the past month, how would you rate your sleep quality overall?

- Very good ( )
- Fairly good ( )
- Fairly bad ( )
- Very bad ( )
7. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?

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8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

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9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

- No problem at all ( )
- Only a very slight problem ( )
- Somewhat of a problem ( )
- A very big problem ( )

10. Do you have a bed partner or roommate?

- No bed partner or roommate ( )
- Partner/roommate in other room ( )
- Partner in same room, but not same bed ( )
- Partner in same bed ( )

If you have a roommate or bed partner, ask him/her how often in the past month you have had...

a) Loud snoring

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b) Long pauses between breaths while asleep

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c) Legs twitching or jerking while you sleep

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d) Episodes of disorientation or confusion during sleep

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e) Other restlessness while you sleep; please describe

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Appendix F

Cover Letter to Participant

Hello and welcome to our study: “Health and Wellbeing during Pregnancy and After Birth”.

We would like to thank you for agreeing to take part in this study. Your participation will help researchers better understand the general experiences of men and women during pregnancy and the first 12 months following birth. The project aims to provide some insight into questions regarding the level and type of distress experienced by men and women across pregnancy and the first postpartum year, and whether any ‘critical periods’ can be identified where early intervention may be most effective.

The present questionnaire pack should take approximately 20 minutes to complete. If you begin filling out the questionnaires and feel you do not wish to continue further you can stop. If the questionnaires raise personal concerns for you, you can call Mr Kim Yong WEE (Alvin) on 9251-7817 or Dr Helen Skouteris on 9251-7699 to discuss these concerns.

Please fill in the questionnaires as accurately as possible and return them in the reply paid envelope provided. All your responses will remain strictly anonymous and confidential.

Yours Sincerely,
The Research Team

PhD (Psych) Candidate: Kim Yong WEE (Alvin)

Principal Researchers: Dr Helen Skouteris, Dr Ciaran Pier and Dr Ben Richardson
Father's Information
To Be Completed By Father

The following questions ask for information about you and your spouse. All responses are strictly confidential.

Please add the date you are filling in this questionnaire below and then answer the following questions with your current pregnancy in mind. Please circle the appropriate responses.

1. Are you currently receiving any of the following? (please circle all that apply)

(1) Counselling or psychological therapy
   If yes, how frequently?
   (a) Once (i.e., single visit)
   (b) Occasionally (i.e., once a month, or every few months)
   (c) Regularly (weekly or fortnightly). If so, for how long? 

(2) Antidepressants

(3) Other medication (please specify): 

(4) Herbal or natural remedies

(5) Other (please specify): 

(6) None of the above
2. How did you hear about our study? Please circle all that apply

(1) radio interview

(2) newspaper article/advert

(3) magazine article/advert

(4) internet article/advert

(5) flyer in medical consulting rooms

(6) word of mouth

(7) other
Please tick ONE set of brackets for each statement below which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

<table>
<thead>
<tr>
<th></th>
<th>Did not apply to me</th>
<th>Some degree / Some of the time</th>
<th>Considerable degree / Great part of time</th>
<th>Very Much / Most of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I found myself getting upset by quite trivial things</td>
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<td>2</td>
<td>I was aware of dryness of my mouth</td>
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<td>I found it difficult to tolerate interruptions to what I was doing</td>
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<tr>
<td>36</td>
<td>I felt terrified</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td>37</td>
<td>I could see nothing in the future to be hopeful about</td>
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<td></td>
<td>Did not apply to me</td>
<td>Some degree / some of the time</td>
<td>Considerable degree / good part of time</td>
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<td>38</td>
<td>I felt that life was meaningless</td>
<td>( )</td>
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<tr>
<td>39</td>
<td>I found myself getting agitated</td>
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<td>40</td>
<td>I was worried about situations in which I might panic and make a fool of myself</td>
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<tr>
<td>41</td>
<td>I experienced trembling (e.g., in the hands)</td>
<td>( )</td>
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<tr>
<td>42</td>
<td>I found it difficult to work up the initiative to do things</td>
<td>( )</td>
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</tbody>
</table>
Appendix G

Cover Letter to Participant

School of Psychology
Deakin University
221 Burwood Highway
Burwood, Victoria 3125

Hello and welcome to our study: “Health and Wellbeing during Pregnancy and After Birth”.

We would like to thank you for agreeing to take part in this study. Your participation will help researchers better understand the general experiences of men and women during pregnancy and the first 12 months following birth. The project aims to provide some insight into questions regarding the level and type of distress experienced by men and women across pregnancy and the first postpartum year, and whether any ‘critical periods’ can be identified where early intervention may be most effective.

The present questionnaire pack should take approximately 10 minutes to complete. If you begin filling out the questionnaires and feel you do not wish to continue further you can stop. If the questionnaires raise personal concerns for you, you can call Mr Kim Yiong WEE (Alvin) on 9251-7817 or Dr Helen Skouteris on 9251-7699 to discuss these concerns.

Please fill in the questionnaires as accurately as possible and return them in the reply paid envelope provided. All your responses will remain strictly anonymous and confidential.

Yours Sincerely,
The Research Team

PhD (Psych) Candidate: Kim Yiong WEE (Alvin)

Principal Researchers: Dr Helen Skouteris, Dr Ciaran Pier and Dr Ben Richardson
Mother's Information
To Be Completed By Mother

The following questions ask for information about you and your spouse. All responses are strictly confidential.

Please add the date you are filling in this questionnaire below and then answer the following questions with your current pregnancy in mind. Please circle the appropriate responses.

Today's date: ............

1. Are you currently receiving any of the following? (please circle all that apply)

   (1) Counselling or psychological therapy

      If yes, how frequently?

      (a) Once (i.e., single visit)
      (b) Occasionally (i.e., once a month, or every few months)
      (c) Regularly (weekly or fortnightly). If so, for how long? .........................

   (2) Antidepressants

   (3) Other medication (please specify): ..................................................

   (4) Herbal or natural remedies

   (5) Other (please specify): ..............................................................

   (6) None of the above
2. How did you hear about our study? Please circle all that apply

(1) radio interview
(2) newspaper article/advert
(3) magazine article/advert
(4) internet article/advert
(5) flyer in medical consulting rooms
(6) word of mouth
(7) other
Please tick ONE set of brackets for each statement below which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

<table>
<thead>
<tr>
<th></th>
<th>Did not apply to me</th>
<th>Some degree / Some of the time</th>
<th>Considerable degree / Most part of the time</th>
<th>Very Much / Most of the time</th>
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<td>19</td>
<td>I perspired noticeably (eg, hands sweaty) in the absence of high temperatures or physical exertion</td>
<td>Did not apply to me</td>
<td>Some degree</td>
<td>Considerable degree</td>
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<td>20</td>
<td>I felt scared without any good reason</td>
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<td>21</td>
<td>I felt that life wasn’t worth while</td>
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38. I felt that life was meaningless

39. I found myself getting agitated

40. I was worried about situations in which I might panic and make a fool of myself

41. I experienced trembling (eg. in the hands)

42. I found it difficult to work up the initiative to do things

Fill in the following and circle “AM” if you complete this part of the questionnaire before 12:00 pm or “PM” if you complete this part of the questionnaire after 12:00 pm.

Date: __________________ Time: ______________ AM/PM

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, what time have you usually gone to bed at night?
   BED TIME __________

2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?
   NUMBER OF MINUTES __________

3. During the past month, what time have you usually gotten up in the morning?
   GETTING UP TIME __________

4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.)
   HOURS OF SLEEP PER NIGHT __________

Please tick ONE set of brackets for each of the remaining questions, that represents your experiences in the past month. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you...
   a) Cannot get to sleep within 30 minutes
      Not during the past month ( ) Less than once a week ( ) Once or twice a week ( ) Three or more times a week ( )
b) Wake up in the middle of the night or early morning

<table>
<thead>
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<th>Frequency</th>
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<tr>
<td>Not during the past month</td>
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c) Have to get up to use the bathroom

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d) Cannot breathe comfortably

<table>
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e) Cough or snore loudly

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f) Feel too cold

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g) Feel too hot

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h) Had bad dreams

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i) Have pain

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j) Other reason(s), please describe

How often during the past month have you had trouble sleeping because of this?

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6. During the past month, how would you rate your sleep quality overall?

- Very good
- Fairly good
- Fairly bad
- Very bad
7. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?

<table>
<thead>
<tr>
<th>Not during the past month</th>
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<th>Once or twice a week</th>
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8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

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</table>

9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

- No problem at all
- Only a very slight problem
- Somewhat of a problem
- A very big problem

10. Do you have a bed partner or roommate?

- No bed partner or roommate
- Partner/roommate in other room
- Partner in same room, but not same bed
- Partner in same bed

If you have a roommate or bed partner, ask him/her how often in the past month you have had . . .

a) Loud snoring

<table>
<thead>
<tr>
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b) Long pauses between breaths while asleep

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c) Legs twitching or jerking while you sleep

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<th>Three or more times a week</th>
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</table>

d) Episodes of disorientation or confusion during sleep

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<th>Not during the past month</th>
<th>Less than once a week</th>
<th>Once or twice a week</th>
<th>Three or more times a week</th>
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</thead>
</table>
e) Other restlessness while you sleep; please describe

| Not during the past month ( ) | Less than once a week ( ) | Once or twice a week ( ) | Three or more times a week ( ) |
Appendix H

Cover Letter to Participant

Hello and welcome back to the third phase of our study: “Health and Wellbeing during Pregnancy and After Birth”.

We would like to thank you again for agreeing to take part in this study.

The present questionnaire pack should take approximately 15 to 20 minutes to complete. If you begin filling out the questionnaires and feel you do not wish to continue further you can stop. If the questionnaires raise personal concerns for you, you can call Mr Kim Yong WEE (Alvin) on 9251-7817 or Dr Helen Skouteris on 9251-7699 to discuss these concerns.

Please fill in the questionnaires as accurately as possible and return them in the reply paid envelope provided. All your responses will remain strictly anonymous and confidential.

Yours Sincerely,
The Research Team

PhD (Psych) Candidate: Kim Yong WEE (Alvin)
Principal Researchers: Dr Helen Skouteris, Dr Ciaran Pier and Dr Ben Richardson
Father's Information
To Be Completed By Father

The following questions ask for information about you and your spouse. All responses are strictly confidential.

Please add the date you are filling in this questionnaire below and then answer the following questions with your current pregnancy in mind. Please circle the appropriate responses.

Today's date: ..........

Please tick ONE set of brackets for each statement below which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

<table>
<thead>
<tr>
<th></th>
<th>Did not apply to me</th>
<th>Some degree</th>
<th>Considerable degree</th>
<th>Very much</th>
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<td></td>
<td>SOME OF THE TIME</td>
<td>GOOD PART OF THE TIME</td>
<td>MOST OF THE TIME</td>
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<tr>
<td>1</td>
<td>I found myself getting upset by quite trivial things</td>
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<tr>
<td>2</td>
<td>I was aware of dryness of my mouth</td>
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<tr>
<td>3</td>
<td>I couldn't seem to experience any positive feeling at all</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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<td>4</td>
<td>I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)</td>
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<tr>
<td>5</td>
<td>I just couldn't seem to get going</td>
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<tr>
<td>6</td>
<td>I tended to over-react to situations</td>
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<td>7</td>
<td>I had a feeling of shakiness (eg, legs going to give way)</td>
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<td>8</td>
<td>I found it difficult to relax</td>
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<tr>
<td>9</td>
<td>I found myself in situations that made me so anxious I was most relieved when they ended</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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<td>10</td>
<td>I felt that I had nothing to look forward to</td>
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<tr>
<td>11</td>
<td>I found myself getting upset rather easily</td>
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<tr>
<td>12</td>
<td>I felt that I was using a lot of nervous energy</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td></td>
<td>Did not apply to me</td>
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<tr>
<td>13</td>
<td>I felt sad and depressed</td>
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<tr>
<td>14</td>
<td>I found myself getting impatient when I was delayed in any way (e.g., lifts, traffic lights, being kept waiting)</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>15</td>
<td>I had a feeling of faintness</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>16</td>
<td>I felt that I had lost interest in just about Everything</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>17</td>
<td>I felt I wasn’t worth much as a person</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>18</td>
<td>I felt that I was rather touchy</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>19</td>
<td>I perspired noticeably (e.g., hands sweaty) in the absence of high temperatures or physical exertion</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>20</td>
<td>I felt scared without any good reason</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>21</td>
<td>I felt that life wasn’t worthwhile</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>22</td>
<td>I found it hard to wind down</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>23</td>
<td>I had difficulty in swallowing</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>24</td>
<td>I couldn’t seem to get any enjoyment out of the things I did</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>25</td>
<td>I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>26</td>
<td>I felt down-hearted and blue</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>27</td>
<td>I found that I was very irritable</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>28</td>
<td>I felt I was close to panic</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>29</td>
<td>I found it hard to calm down after something upset me</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>30</td>
<td>I feared that I would be “thrown” by some trivial But unfamiliar task</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>31</td>
<td>I was unable to become enthusiastic about Anything</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td></td>
<td>Did not apply to me</td>
<td>Some degree / some of the time</td>
<td>Considerable degree / most part of the time</td>
<td>Very much / all of the time</td>
</tr>
<tr>
<td>---</td>
<td>-------------------</td>
<td>--------------------------------</td>
<td>---------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>32</td>
<td>I found it difficult to tolerate interruptions to what I was doing</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>33</td>
<td>I was in a state of nervous tension</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>34</td>
<td>I felt I was pretty worthless</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>35</td>
<td>I was intolerant of anything that kept me from getting on with what I was doing</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>36</td>
<td>I felt terrified</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>37</td>
<td>I could see nothing in the future to be hopeful about</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>38</td>
<td>I felt that life was meaningless</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>39</td>
<td>I found myself getting agitated</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>40</td>
<td>I was worried about situations in which I might panic and make a fool of myself</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>41</td>
<td>I experienced trembling (e.g., in the hands)</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>42</td>
<td>I found it difficult to work up the initiative to do things</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

Most people have disagreements in their relationships. Please indicate below the approximate extent of agreement or disagreement between you and your partner for each item on the following list. Please tick ONE set of brackets for each statement:

<table>
<thead>
<tr>
<th></th>
<th>Always Agree</th>
<th>Almost Always Agree</th>
<th>Occasionally Disagree</th>
<th>Frequently Disagree</th>
<th>Almost Always Disagree</th>
<th>Always Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Handling family finances</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2. Matters of recreation</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3. Religious matters</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>4. Demonstrations of Affection</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>5. Friends</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>6. Sex relations</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>7. Conventionality (correct or proper behavior)</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>8. Philosophy of life</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>Question</td>
<td>Always Agree</td>
<td>Almost Always Agree</td>
<td>Occasionally Agree</td>
<td>Frequently Disagree</td>
<td>Almost Always Disagree</td>
<td>Always Disagree</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
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<td>---------------------</td>
<td>--------------------</td>
<td>---------------------</td>
<td>------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>9. Ways of dealing with parents or in-laws</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Aims, goals, and things believed important</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Making major Decisions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Amount of time spent together</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Household tasks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Leisure time interests and activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Career decisions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>16. How often do you discuss or have you considered divorce, separation, or terminating your relationship?</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>17. How often do you or your mate leave the house after a fight?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>18. In general, how often do you think that things between you and your partner are going well?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>19. Do you confide in your mate?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Do you ever regret that you married (or lived together)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. How often do you and your partner quarrel?</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>22. How often do you and your mate “get on each others’ nerves”?</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
### 23. Do you kiss your mate?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Every day</th>
<th>Almost every day</th>
<th>Occasionally</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>All of them</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>Most of them</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>Some of them</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>Very few of them</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>None of them</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

### 24. Do you and your mate engage in outside interests together?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Every day</th>
<th>Almost every day</th>
<th>Occasionally</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>All of them</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>Most of them</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>Some of them</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>Very few of them</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>None of them</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

### How often would you say the following events occur between you and your mate?

25. Have a stimulating Exchange of ideas

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Never</th>
<th>Less than once a month</th>
<th>Once or twice a month</th>
<th>Once or twice a week</th>
<th>Once a day</th>
<th>More often</th>
</tr>
</thead>
<tbody>
<tr>
<td>( )</td>
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<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

26. Laugh together

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Never</th>
<th>Less than once a month</th>
<th>Once or twice a month</th>
<th>Once or twice a week</th>
<th>Once a day</th>
<th>More often</th>
</tr>
</thead>
<tbody>
<tr>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

27. Calmly discuss something

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Never</th>
<th>Less than once a month</th>
<th>Once or twice a month</th>
<th>Once or twice a week</th>
<th>Once a day</th>
<th>More often</th>
</tr>
</thead>
<tbody>
<tr>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

28. Work together on A project

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Never</th>
<th>Less than once a month</th>
<th>Once or twice a month</th>
<th>Once or twice a week</th>
<th>Once a day</th>
<th>More often</th>
</tr>
</thead>
<tbody>
<tr>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

There are some things about which couples sometimes agree and sometimes disagree. Indicate if either item below caused differences of opinions or were problems in your relationship during the past few weeks. Please put ONE set of brackets for each statement.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>( X )</td>
<td>Being too tired for sex.</td>
</tr>
<tr>
<td>( X )</td>
<td>Not showing love.</td>
</tr>
</tbody>
</table>

31. The dots on the following line represent different degrees of happiness in your relationship. The middle point, "happy," represents the degree of happiness of most relationships. Please circle the dot which best describes the degree of happiness, all things considered, of your relationship.

<table>
<thead>
<tr>
<th>Extremely Unhappy</th>
<th>Fairly Unhappy</th>
<th>A Little Unhappy</th>
<th>Happy</th>
<th>Very Happy</th>
<th>Extremely happy</th>
<th>Perfect</th>
</tr>
</thead>
</table>


32. Which of the following statements best describes how you feel about the future of your relationship? Place a tick next to the one statement that best describes how you feel about the future of your relationship.

( ) I want desperately for my relationship to succeed, and would go to almost any length to see that it does.
( ) I want very much for my relationship to succeed, and will do all I can to see that it does.
( ) I want very much for my relationship to succeed, and will do my fair share to see that it does.
( ) It would be nice if my relationship succeeded, but I can’t do much more than I am doing now to help it succeed.
( ) It would be nice if it succeeded, but I refuse to do any more than I am doing now to keep the relationship going.
( ) My relationship can never succeed, and there is no more that I can do to keep the relationship going.

33. When disagreements arise, they usually result in (Please tick ONE set of brackets for each statement):

Husband giving in Wife giving in Agreement by mutual give & take
( ) ( ) ( )

34a. In leisure time, do you generally prefer (Please tick ONE set of brackets for each statement):

To be “on the go” To stay at home
( ) ( )

34b. Does your partner generally prefer (Please tick ONE set of brackets for each statement):

To be “on the go” To stay at home
( ) ( )

35. Do you ever wish you had not married? (Please tick ONE set of brackets for each statement):

Frequently Occasionally Rarely Never
( ) ( ) ( ) ( )

36. If you had your life to live over, do you think you would (Please tick ONE set of brackets for each statement):

Marry the same person Marry a different person Not marry at all
( ) ( ) ( )
The following questions ask about how much you have experienced certain things in the \textit{last two weeks}. If you have experienced these things an extreme amount, tick in the bracket below "Extremely". If you have not experienced these things at all, tick in the bracket below "Not at all". Questions refer to the \textit{last two weeks}.

1. How well are your sexual needs fulfilled?

\begin{tabular}{|c|c|c|c|c|}
\hline
 & Not at all & Slightly & Moderately & Very much & Extremely \\
\hline
\end{tabular}

2. Are you bothered by any difficulties in your sex life?

\begin{tabular}{|c|c|c|c|c|}
\hline
 & Not at all & Slightly & Moderately & Very much & Extremely \\
\hline
\end{tabular}

The following question asks you to say how satisfied, happy or good you have felt about your sex life over the last two weeks. Please tick \textbf{ONE set of brackets for each statement} that best fits how satisfied or dissatisfied you have felt in the \textit{last two weeks}.

3. How satisfied are you with your sex life?

\begin{tabular}{|c|c|c|c|c|}
\hline
 & Very dissatisfied & Dissatisfied & Neither satisfied nor dissatisfied & Satisfied & Very satisfied \\
\hline
\end{tabular}

4. How would you rate your sex life?

\begin{tabular}{|c|c|c|c|c|}
\hline
 & Very poor & Poor & Neither poor nor good & Good & Very good \\
\hline
\end{tabular}

Fill in the following and circle "AM" if you complete this part of the questionnaire before 12:00pm or "PM" if you complete this part of the questionnaire after 12:00pm.

Date: ____________ Time: ____________ AM

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, what time have you usually gone to bed at night?
   \textbf{BED TIME} ____________

2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?
   \textbf{NUMBER OF MINUTES} ____________
3. During the past month, what time have you usually gotten up in the morning?  
**GETTING UP TIME**

4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.)  
**HOURS OF SLEEP PER NIGHT**

*Please tick ONE set of brackets for each of the remaining questions, that represents your experiences in the past month. Please answer all questions.*

5. During the past month, how often have you had trouble sleeping because you . . .

a) Cannot get to sleep within 30 minutes

<table>
<thead>
<tr>
<th>Less than</th>
<th>Once or twice</th>
<th>Three or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>past month ( )</td>
<td>a week ( )</td>
<td>times a week ( )</td>
</tr>
</tbody>
</table>

b) Wake up in the middle of the night or early morning

<table>
<thead>
<tr>
<th>Less than</th>
<th>Once or twice</th>
<th>Three or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>past month ( )</td>
<td>a week ( )</td>
<td>times a week ( )</td>
</tr>
</tbody>
</table>

c) Have to get up to use the bathroom

<table>
<thead>
<tr>
<th>Less than</th>
<th>Once or twice</th>
<th>Three or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>past month ( )</td>
<td>a week ( )</td>
<td>times a week ( )</td>
</tr>
</tbody>
</table>

d) Cannot breathe comfortably

<table>
<thead>
<tr>
<th>Less than</th>
<th>Once or twice</th>
<th>Three or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>past month ( )</td>
<td>a week ( )</td>
<td>times a week ( )</td>
</tr>
</tbody>
</table>

e) Cough or snore loudly

<table>
<thead>
<tr>
<th>Less than</th>
<th>Once or twice</th>
<th>Three or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>past month ( )</td>
<td>a week ( )</td>
<td>times a week ( )</td>
</tr>
</tbody>
</table>

f) Feel too cold

<table>
<thead>
<tr>
<th>Less than</th>
<th>Once or twice</th>
<th>Three or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>past month ( )</td>
<td>a week ( )</td>
<td>times a week ( )</td>
</tr>
</tbody>
</table>

g) Feel too hot

<table>
<thead>
<tr>
<th>Less than</th>
<th>Once or twice</th>
<th>Three or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>past month ( )</td>
<td>a week ( )</td>
<td>times a week ( )</td>
</tr>
</tbody>
</table>
h) Had bad dreams

<table>
<thead>
<tr>
<th>Less than</th>
<th>Once or twice</th>
<th>Three or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>past month ( )</td>
<td>a week ( )</td>
<td>times a week ( )</td>
</tr>
</tbody>
</table>
l) Have pain

<table>
<thead>
<tr>
<th>Less than</th>
<th>Once or twice</th>
<th>Three or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>past month ( )</td>
<td>a week ( )</td>
<td>times a week ( )</td>
</tr>
</tbody>
</table>
10. Other reason(s), please describe _____________________________________________

How often during the past month have you had trouble sleeping because of this?

<table>
<thead>
<tr>
<th>Not during the past month</th>
<th>Less than once a week</th>
<th>Once or twice a week</th>
<th>Three or more times a week</th>
</tr>
</thead>
</table>

6. During the past month, how would you rate your sleep quality overall?

- Very good ( )
- Fairly good ( )
- Fairly bad ( )
- Very bad ( )

7. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?

<table>
<thead>
<tr>
<th>Not during the past month</th>
<th>Less than once a week</th>
<th>Once or twice a week</th>
<th>Three or more times a week</th>
</tr>
</thead>
</table>

8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

<table>
<thead>
<tr>
<th>Not during the past month</th>
<th>Less than once a week</th>
<th>Once or twice a week</th>
<th>Three or more times a week</th>
</tr>
</thead>
</table>

9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

- No problem at all ( )
- Only a very slight problem ( )
- Somewhat of a problem ( )
- A very big problem ( )

10. Do you have a bed partner or roommate?

- No bed partner or roommate ( )
- Partner/roommate in other room ( )
- Partner in same room, but not same bed ( )
- Partner in same bed ( )
If you have a roommate or bed partner, ask him/her how often in the past month you have had . . .

<table>
<thead>
<tr>
<th>Question</th>
<th>Frequency Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Loud snoring</td>
<td>Not during the past month ( )</td>
</tr>
<tr>
<td>b) Long pauses between breaths while asleep</td>
<td>Not during the past month ( )</td>
</tr>
<tr>
<td>c) Legs twitching or jerking while you sleep</td>
<td>Not during the past month ( )</td>
</tr>
<tr>
<td>d) Episodes of disorientation or confusion during sleep</td>
<td>Not during the past month ( )</td>
</tr>
<tr>
<td>e) Other restlessness while you sleep; please describe</td>
<td>Not during the past month ( )</td>
</tr>
</tbody>
</table>
Appendix I

Cover Letter to Participant

School of Psychology
Deakin University
221 Burwood Highway
Burwood, Victoria 3125

Hello and welcome back to the third phase of our study: "Health and Wellbeing during Pregnancy and After Birth".

We would like to thank you again for agreeing to take part in this study.

The present questionnaire pack should take approximately 10 to 15 minutes to complete. If you begin filling out the questionnaires and feel you do not wish to continue further you can stop. If the questionnaires raise personal concerns for you, you can call Mr Kim Yong WEE (Alvin) on 9251-7817 or Dr Helen Skouteris on 9251-7609 to discuss these concerns.

Please fill in the questionnaires as accurately as possible and return them in the reply paid envelope provided. All your responses will remain strictly anonymous and confidential.

Yours Sincerely,
The Research Team

PhD (Psych) Candidate: Kim Yong WEE (Alvin)
Principal Researchers: Dr Helen Skouteris, Dr Ciaran Pier and Dr Ben Richardson
Mother's Information
To Be Completed By Mother

The following questions ask for information about you and your spouse. All responses are strictly confidential.

Please add the date you are filling in this questionnaire below and then answer the following questions with your current pregnancy in mind. Please circle the appropriate responses.

Today's date: __________

Please tick ONE set of brackets for each statement below which indicates how much the statement applies to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

<table>
<thead>
<tr>
<th></th>
<th>Did not apply to me</th>
<th>Some degree / Some of the time</th>
<th>Considerable degree / Good part of time</th>
<th>Very Much / Most of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I found myself getting upset by quite trivial things</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2</td>
<td>I was aware of dryness of my mouth</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3</td>
<td>I couldn't seem to experience any positive feeling at all</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>4</td>
<td>I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>5</td>
<td>I just couldn't seem to get going</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>6</td>
<td>I tended to over-react to situations</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>7</td>
<td>I had a feeling of shakiness (eg, legs going to give way)</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>8</td>
<td>I found it difficult to relax</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>9</td>
<td>I found myself in situations that made me so anxious I was most relieved when they ended</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>10</td>
<td>I felt that I had nothing to look forward to</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>11</td>
<td>I found myself getting upset rather easily</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>12</td>
<td>I felt that I was using a lot of nervous energy</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td></td>
<td></td>
<td>Did not apply to me</td>
<td>Some degree / some of the time</td>
<td>Considerable degree / good part of the time</td>
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<td>------------------------------------------------------------------</td>
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<tr>
<td>13</td>
<td>I felt sad and depressed</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>14</td>
<td>I found myself getting impatient when I was delayed in any way (e.g. lifts, traffic lights, being kept waiting)</td>
<td>( )</td>
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</tr>
<tr>
<td>15</td>
<td>I had a feeling of faintness</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>16</td>
<td>I felt that I had lost interest in just about Everything</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>17</td>
<td>I felt I wasn’t worth much as a person</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>18</td>
<td>I felt that I was rather touchy</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>19</td>
<td>I perspired noticeably (e.g. hands sweaty) in the absence of high temperatures or physical exertion</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>20</td>
<td>I felt scared without any good reason</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>21</td>
<td>I felt that life wasn’t worthwhile</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>22</td>
<td>I found it hard to wind down</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>23</td>
<td>I had difficulty in swallowing</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>24</td>
<td>I couldn’t seem to get any enjoyment out of the things I did</td>
<td>( )</td>
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<td>( )</td>
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<tr>
<td>25</td>
<td>I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)</td>
<td>( )</td>
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<td>( )</td>
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<tr>
<td>26</td>
<td>I felt down-hearted and blue</td>
<td>( )</td>
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<td>( )</td>
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<tr>
<td>27</td>
<td>I found that I was very irritable</td>
<td>( )</td>
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<tr>
<td>28</td>
<td>I felt I was close to panic</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>29</td>
<td>I found it hard to calm down after something upset me</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>30</td>
<td>I feared that I would be &quot;thrown&quot; by some trivial but unfamiliar task</td>
<td>( )</td>
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<tr>
<td>31</td>
<td>I was unable to become enthusiastic about Anything</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>Number</td>
<td>Description</td>
<td>Did not apply to me</td>
<td>Some degree / some of the time</td>
<td>Considerable degree / most of the time</td>
</tr>
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<td>----------------------------------------</td>
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<tr>
<td>32</td>
<td>I found it difficult to tolerate interruptions to what I was doing</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>33</td>
<td>I was in a state of nervous tension</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>34</td>
<td>I felt I was pretty worthless</td>
<td>( )</td>
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<tr>
<td>35</td>
<td>I was intolerant of anything that kept me from getting on with what I was doing</td>
<td>( )</td>
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<tr>
<td>36</td>
<td>I felt terrified</td>
<td>( )</td>
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<tr>
<td>37</td>
<td>I could see nothing in the future to be hopeful about</td>
<td>( )</td>
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<tr>
<td>38</td>
<td>I felt that life was meaningless</td>
<td>( )</td>
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<tr>
<td>39</td>
<td>I found myself getting agitated</td>
<td>( )</td>
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<td>40</td>
<td>I was worried about situations in which I might panic and make a fool of myself</td>
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<tr>
<td>41</td>
<td>I experienced trembling (e.g., in the hands)</td>
<td>( )</td>
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<tr>
<td>42</td>
<td>I found it difficult to work up the initiative to do things</td>
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</tbody>
</table>

Most people have disagreements in their relationships. Please indicate below the approximate extent of agreement or disagreement between you and your partner for each item on the following list. Please tick ONE set of brackets for each statement.

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Always Agree</th>
<th>Almost Agree</th>
<th>Occasionally Agree</th>
<th>Frequently Disagree</th>
<th>Almost Disagree</th>
<th>Always Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Handling family Finance</td>
<td></td>
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<tr>
<td>2. Matters of recreation</td>
<td></td>
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<tr>
<td>3. Religious matters</td>
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<td>4. Demonstrations of affection</td>
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<td>5. Friends</td>
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<tr>
<td>6. Sex relations</td>
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<tr>
<td>7. Conventionality (correct or proper behavior)</td>
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<tr>
<td>8. Philosophy of life</td>
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<tr>
<td>9. Ways of dealing with parents or in-laws</td>
<td>Always Agree</td>
<td>Almost Agree</td>
<td>Occasionally Disagree</td>
<td>Frequently Disagree</td>
<td>Almost Disagree</td>
<td>Always Disagree</td>
</tr>
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<tr>
<td>10. Aims, goals, and things believed important</td>
<td>( ) ( ) ( ) ( ) ( )</td>
<td>( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td>11. Making major Decisions</td>
<td>( ) ( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td>12. Amount of time spent together</td>
<td>( ) ( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td>13. Household tasks</td>
<td>( ) ( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td>14. Leisure time interests and activities</td>
<td>( ) ( ) ( ) ( ) ( ) ( )</td>
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<tr>
<td>15. Career decisions</td>
<td>( ) ( ) ( ) ( ) ( ) ( )</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>16. How often do you discuss or have you considered divorce, separation, or terminating your relationship?</th>
<th>All the Time</th>
<th>Most of the time</th>
<th>More often than not</th>
<th>Occasionally</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. How often do you or your mate leave the house after a fight?</td>
<td>( ) ( ) ( ) ( ) ( ) ( ) ( )</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>18. In general, how often do you think that things between you and your partner are going well?</td>
<td>( ) ( ) ( ) ( ) ( ) ( ) ( )</td>
<td></td>
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<tr>
<td>19. Do you confide in your mate?</td>
<td>( ) ( ) ( ) ( ) ( ) ( ) ( )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>20. Do you ever regret that you married (or lived together)?</td>
<td>( ) ( ) ( ) ( ) ( ) ( ) ( )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. How often do you and your partner quarrel?</td>
<td>( ) ( ) ( ) ( ) ( ) ( ) ( )</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. How often do you and your mate &quot;get on each others' nerves?&quot;</td>
<td>( ) ( ) ( ) ( ) ( ) ( ) ( )</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
23. Do you kiss your mate?

( ) ( ) ( ) ( ) ( ) ( )

24. Do you and your mate engage in outside interests together?

( ) ( ) ( ) ( ) ( ) ( )

How often would you say the following events occur between you and your mate?

25. Have a stimulating Exchange of ideas

( ) ( ) ( ) ( ) ( ) ( ) ( )

26. Laugh together

( ) ( ) ( ) ( ) ( ) ( ) ( )

27. Cautiously discuss something

( ) ( ) ( ) ( ) ( ) ( ) ( )

28. Work together on
A project

( ) ( ) ( ) ( ) ( ) ( ) ( )

There are some things about which couples sometimes agree and sometimes disagree. Indicate if either item below caused differences of opinions or were problems in your relationship during the past few weeks. **Please link ONE set of brackets for each statement.**

Yes  No

29. ( ) ( ) Being too tired for sex.

30. ( ) ( ) Not showing love.

31. The dots on the following line represent different degrees of happiness in your relationship. The middle point, "happy," represents the degree of happiness of most relationships. Please circle the dot which best describes the degree of happiness, all things considered, of your relationship.

Extremely Unhappy  Fairly Unhappy  A Little Unhappy  Happy  Very Happy  Extremely happy  Perfect
32. Which of the following statements best describes how you feel about the future of your relationship? Place a tick next to the one statement that best describes how you feel about the future of your relationship.

( ) I want desperately for my relationship to succeed, and would go to almost any length to see that it does.

( ) I want very much for my relationship to succeed, and will do all I can to see that it does.

( ) I want very much for my relationship to succeed, and will do my fair share to see that it does.

( ) It would be nice if my relationship succeeded, but I can’t do much more than I am doing now to help it succeed.

( ) It would be nice if it succeeded, but I refuse to do any more than I am doing now to keep the relationship going.

( ) My relationship can never succeed, and there is no more that I can do to keep the relationship going.

33. When disagreements arise, they usually result in (Please tick ONE set of brackets for each statement):

Husband giving in    Wife giving in    Agreement by mutual give & take
( )                  ( )                    ( )

34a. In leisure time, do you generally prefer (Please tick ONE set of brackets for each statement):

To be “on the go”    To stay at home
( )                  ( )

34b. Does your partner generally prefer (Please tick ONE set of brackets for each statement):

To be “on the go”    To stay at home
( )                  ( )

35. Do you ever wish you had not married? (Please tick ONE set of brackets for each statement):

Frequently    Occasionally    Rarely    Never
( )                  ( )                    ( )                 ( )

36. If you had your life to live over, do you think you would (Please tick ONE set of brackets for each statement):

Marry the same person    Marry a different person    Not marry at all
( )                  ( )                    ( )
Fill in the following and circle “AM” if you complete this part of the questionnaire before 12:00pm or “PM” if you complete this part of the questionnaire after 12:00pm.

Date: ___________ Time ___________ AM ___________ PM ___________

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, what time have you usually gone to bed at night?
   **BED TIME** ___________

2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?
   **NUMBER OF MINUTES** ___________

3. During the past month, what time have you usually gotten up in the morning?
   **GETTING UP TIME** ___________

4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.)
   **HOURS OF SLEEP PER NIGHT** ___________

*Please tick ONLY one of the remaining questions, that represents your experiences in the past month. Please answer all questions.*

5. During the past month, how often have you had trouble sleeping because you . . .
   a) Cannot get to sleep within 30 minutes
      - Not during the past month ( )
      - Less than once a week ( )
      - Once or twice a week ( )
      - Three or more times a week ( )

   b) Wake up in the middle of the night or early morning
      - Not during the past month ( )
      - Less than once a week ( )
      - Once or twice a week ( )
      - Three or more times a week ( )

   c) Have to get up to use the bathroom
      - Not during the past month ( )
      - Less than once a week ( )
      - Once or twice a week ( )
      - Three or more times a week ( )

   d) Cannot breathe comfortably
      - Not during the past month ( )
      - Less than once a week ( )
      - Once or twice a week ( )
      - Three or more times a week ( )

   e) Cough or snore loudly
      - Not during the past month ( )
      - Less than once a week ( )
      - Once or twice a week ( )
      - Three or more times a week ( )
f) Feel too cold
Not during the past month ( ) once a week ( ) less than Once or twice Three or more times a week ( )

h) Feel too hot
Not during the past month ( ) once a week ( ) less than Once or twice Three or more times a week ( )

h) Had bad dreams
Not during the past month ( ) once a week ( ) less than Once or twice Three or more times a week ( )

i) Have pain
Not during the past month ( ) once a week ( ) less than Once or twice Three or more times a week ( )

j) Other reason(s), please describe

How often during the past month have you had trouble sleeping because of this?
Not during the past month ( ) once a week ( ) less than Once or twice Three or more times a week ( )

6. During the past month, how would you rate your sleep quality overall?

Very good ( )
Fairly good ( )
Fairly bad ( )
Very bad ( )

7. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?
Not during the past month ( ) once a week ( ) less than Once or twice Three or more times a week ( )

8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?
Not during the past month ( ) once a week ( ) less than Once or twice Three or more times a week ( )
9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

- No problem at all ( )
- Only a very slight problem ( )
- Somewhat of a problem ( )
- A very big problem ( )

10. Do you have a bed partner or roommate?

- No bed partner or roommate ( )
- Partner/roommate in other room ( )
- Partner in same room, but not same bed ( )
- Partner in same bed ( )

If you have a roommate or bed partner, ask him/her how often in the past month you have had . . .

a) Loud snoring

- Not during the past month ( )
- Less than once a week ( )
- Once or twice a week ( )
- Three or more times a week ( )

b) Long pauses between breaths while asleep

- Not during the past month ( )
- Less than once a week ( )
- Once or twice a week ( )
- Three or more times a week ( )

c) Legs twitching or jerking while you sleep

- Not during the past month ( )
- Less than once a week ( )
- Once or twice a week ( )
- Three or more times a week ( )

d) Episodes of disorientation or confusion during sleep

- Not during the past month ( )
- Less than once a week ( )
- Once or twice a week ( )
- Three or more times a week ( )

e) Other restlessness while you sleep; please describe __________________________

- Not during the past month ( )
- Less than once a week ( )
- Once or twice a week ( )
- Three or more times a week ( )