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PATERNAL PERINATAL DEPRESSION: A NARRATIVE REVIEW

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ABSTRACT

The perinatal period, which covers the time when a man's partner becomes pregnant through to the first year after birth can be a time of great excitement, happiness, and joy. However, it can also be a time of great disruption and change. Despite the positive and protective long-term effect that fatherhood has on men's health, a significant proportion of fathers' experience depressive symptoms during the perinatal period. This paper aims to review studies that assessed symptoms of depression in fathers during the perinatal period and to describe the prevalence estimates, identify the risk factors and impact of depression, and establish if there are interventions that effectively reduce depression among fathers. A systematic search of relevant electronic databases including Medline, CINAHL, Cochrane Library, PsycARTICLES, PsycINFO, and Psychology and Behavioural Sciences Collection were searched using keywords related to paternal perinatal depression. Prevalence estimates of paternal perinatal depression varied widely between studies, ranging from 1 to 46%. Several sociodemographic variables that contribute to depression in fathers in the perinatal period were reported and these include paternal age, lower education levels, parity, an unplanned pregnancy, and maternal depression. Paternal perinatal depression is associated with morbidity within the father's family, including depression in his partner, maladjustment to parenthood and future psychological problems in his children. In conclusion, evidence from this review adds further support for the need to review how we plan, provide and resource our health services, to recognize the influence that pregnancy, birth, and fatherhood in the perinatal period can have on men's mental health.

Keywords: *Fathers; Men's health; Mental health; Perinatal; Depression; Narrative review*

Fatherhood for the majority of men is an enjoyable and rewarding experience.[1–8] However, the transition to fatherhood, or the arrival of subsequent children, can also be a time of great stress and anxiety.[9] During the perinatal period, feelings of pride, happiness, and excitement can be diminished by a lack of sleep, difficulties in caring for an infant, financial concerns, and changes in emotional and sexual relationships.[10,11] While most fathers will cope with and adapt to these and other stressors, a small, but significant, proportion will experience depressive symptoms.[12] Due to the possible negative effects of perinatal depression on fathers and their families,[13,14] it is important to establish the prevalence of depression, identify the risk factors and the impact of depression, and identify interventions that reduce the father's depression during

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the perinatal period. Knowing the risk factors that contribute to depression will help identify fathers who are likely to develop depression, while an examination of the impact of depression and effective interventions will help inform service development and lead to targeted supports for fathers and their families. This paper aims to provide a comprehensive summation of the research literature related to paternal perinatal depression (PPND) by identifying how symptoms of depression are measured; the levels/prevalence of depressive symptoms; the factors contributing to, and impact of depression symptoms on fathers concerning their health and social relationships; and intervention and strategies used to prevent and manage symptoms of depression. To achieve the aim outlined above, a narrative review was undertaken.

A narrative review is an appropriate method to use when the intention is to identify what has been accomplished previously in the research literature, and to provide the reader with a broad, comprehensive, up-to-date summation of a topic area.[15] This type of review also provides researchers with an opportunity to identify areas where future research is needed. Given the potential impact of PPND, and the need for clinicians, policymakers and developers of clinical guidelines to have access to targeted information to inform healthcare decision-making, a narrative review is both timely and warranted. For this review, paternal perinatal depression is taken to mean generic depression symptomatology, assessed by non-specific self-report inventories.

METHODS

Search Strategy and Study Selection

This review was informed by a systematic search of Medline, CINAHL, PsycARTICLES, PsycINFO, and Psychology and Behavioural Science Collection, Cochrane Library for primary studies, systematic reviews, and meta-analyses. Backward and forward citation searches were also conducted. The search strategy included the Boolean terms "OR"/ "AND," and truncation. The following keywords and their synonyms were combined (father* OR paternal OR dad* OR male OR men) AND (prenatal OR prepartum OR antenatal OR antepartum OR perinatal OR peripartum OR postnatal OR postpartum OR preg* OR childbirth OR birth OR labour OR labor) AND (depress*). Relevant 'Medical Subject Heading' (MeSH) and CINAHL headings were also used. Studies for inclusion were published in English and researched paternal depression during the perinatal period. Studies that reported depression in couples were included when the data specific to fathers and mothers were reported separately.

The electronic search strategy yielded 1121 records. These records were exported to EndNoteX9 and there were 894 records after duplicates were removed. The titles and abstracts of these records were screened and a total of 753 papers were excluded for reasons such as the study was not assessing depression in the perinatal period, the sample did not include fathers or fathers and mother's results were not reported separately. Following this process, 141 papers full text were reviewed. The final search output was 101 papers. The selection process and output is presented in Figure 1.

FINDINGS

Defining Paternal Perinatal Depression

Currently, there is no universal definition for PPND.[16,17,18] Researchers and clinicians have generally used the term PPND when referring to depressive symptoms occurring from the time of pregnancy through to the first year after birth.[19] This includes both new-onset and relapse or reoccurrence of pre-existing depression.[20] The majority of research to date on PPND has focused on symptoms of depression, assessed by non-specific self-report inventories such as the Edinburgh Postnatal Depression Scale (EPDS) and Becks Depression Inventory (BDI).[17] The findings from this research,[16,17] relate to symptoms of depression rather than a perinatal depression diagnosis as outlined by the *Diagnostic and Statistical Manual of Mental Disorders*.[21] The distinction between depression symptoms and disorders is not always explicit in the research literature and the terms 'depression' 'depression symptoms' and 'depression disorder' are often used interchangeably. In the perinatal period, depressive responses in most cases are transitory and adaptive in nature[22]; however, they are associated with significant morbidity within the father's family, including depression in his partner, maladjustment to parenthood and future psychological problems in his children.[13,14]

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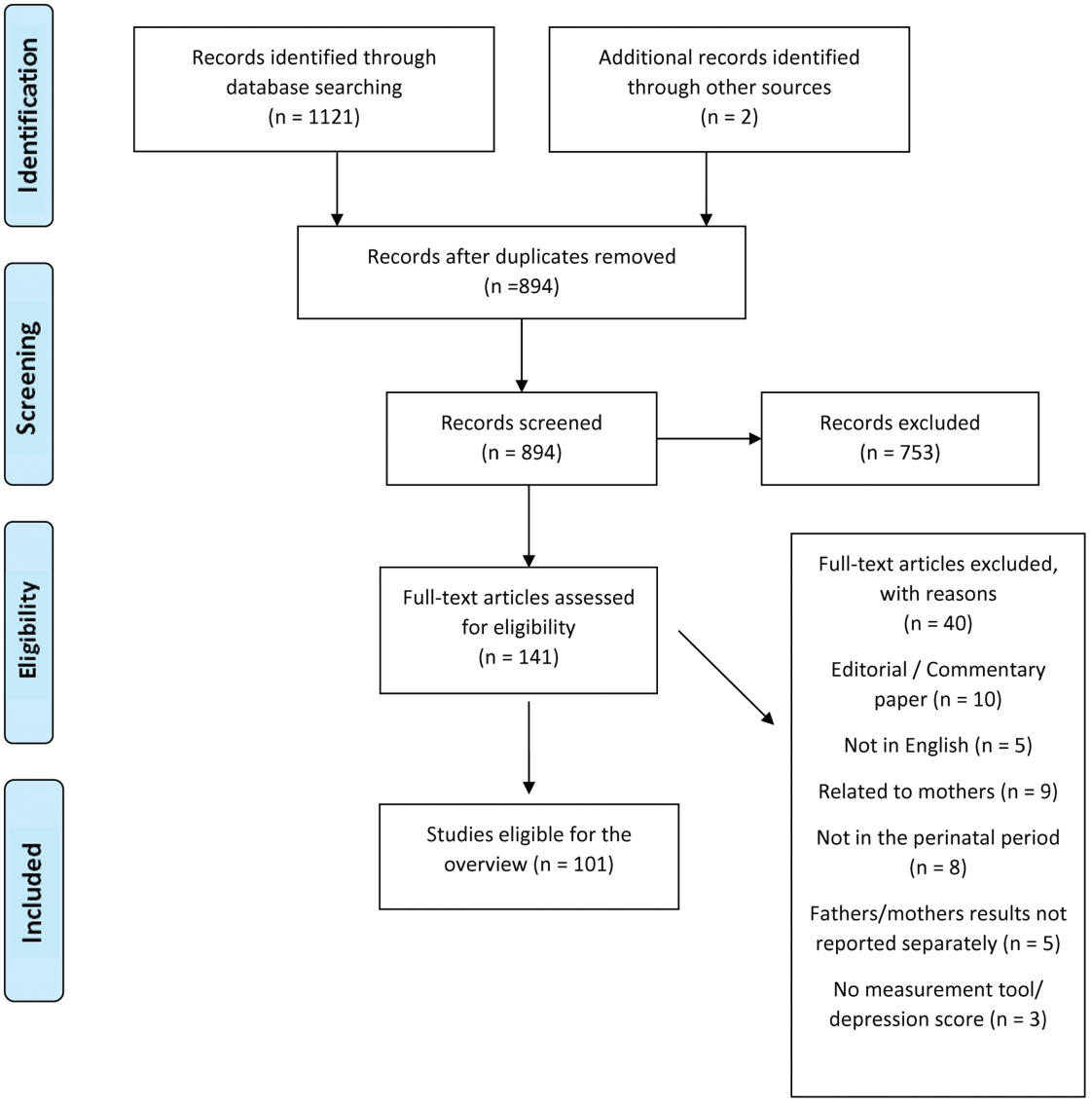
FIG. 1 Study selection flow diagram (PRISMA 2009) Moher et al.[105]



Many of the symptoms experienced by fathers in the perinatal period are the same as those experienced by men in the general population who are not fathers.[16,17] These include low mood, sense of hopelessness, fatigue, changes in appetite/weight, loss of interest in work, hobbies, and sex, intense worrying, negative thoughts, irritability, frustration, and anger.[18] However, some symptoms are specific and unique to fathers in the perinatal period such as confusion in fathering roles, concerns about one's ability to father and decreased engagement in infant caregiving activities.[16,17]

Prevalence of PPND Across the Perinatal Period

Globally, the total number of people with depression is estimated to exceed 300 million, equivalent to 4.4% of the world's population.[20] Depression is ranked by WHO as the single largest contributor to global disability (7.5% of all years lived with disability).[23] Reported prevalence rates for symptoms of PPND have shown wide statistical variation.[17] This wide statistical variation may be attributed to the lack of a clear definition, sample size, recruitment strategies, follow-up time-periods, inclusion and exclusion

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criteria, the cultural setting of the study and the use of different measurement tools and cut-off scores.[17] For example, a study by Dudley et al.[21] assessed paternal perinatal depressive symptoms among 92 fathers between 1- 6 months postpartum using three different assessment tools (the EPDS≥ 12, the BDI≥ 10, and the GHQ-30≥ 5). Dudley et al.[21] reported varying prevalence rates depending on the tool used, 11.8% on the EPDS, 17.4% on the BDI and 46.2% on the GHQ. While Dudley et al.[24] reported varying prevalence rates using different measurement tools, the available literature highlights that using two different cut-off scores for the same measurement tool can also result in varying prevalence rates.[25] For example, Philpott and Corcoran[25] (n=100) used an EPDS cut-off score of ≥ 12 for major depression and ≥ 9 for minor depression and reported prevalence rates of 12% and 28% respectively.

To date, there has been one integrative review,[26] and two meta-analyses on PPND.[16,17] Goodman[26] undertook an integrative review and identified 20 studies reporting on PPND. All the studies were undertaken in the postnatal period, with assessment time points ranging from 3 days to 12 months. All the studies that assessed depressive symptoms in fathers were from community samples and used standard-ized self-report instruments.[26] Estimates of paternal perinatal depression in the review ranged from 1.2 to 25.5%.[26] Goodman[26] suggested that the use of multiple measures for determining the presence of depression, differing sensitivities of the various instruments used to measure depression, and varying data collection times pose difficulties in comparing studies and may be the reason for the wide variation in prevalence rates.

The first meta-analysis of PPND was undertaken by Paulson and Bazemore[16] who identified 43 studies, with 28,004 participants and reported a prevalence of 10.8%. Six years later Cameron et al.[17] undertook a meta-analysis, and identified 74 studies, with 41,480 participants and reported a prevalence of 8.4% (95% CI, 7.2–9.6%). Between 2010 and 2016 there were 29 additional studies. This would suggest that the topic of PPND is gaining interest among researchers. Both meta-analyses calculated prevalence rates across the perinatal period.[16,17] Paulson and Bazemore[16] reported the 3–6 months postnatal period as having the highest prevalence estimate of depression at 25.6%, however, they recommend cautious interpretation due to the small number of studies measuring paternal depression during this period. Cameron et al.[17] reporting the findings from their meta-analysis with 29 additional studies, were able to conduct more refined moderation analysis, and they also found that the 3–6 months postnatal period had the highest prevalence estimate of depression, however, the rate was much lower at 13.0%. Paulson and Bazemore[16] reported relatively lower rates of depression during birth to the 3-month postnatal period at 7.7%. Similarly, Cameron et al.[17] reported lower rates of depression during this period at 7.8%. Both meta-analyses also reported on prenatal depression with Cameron et al.[17] reporting a prevalence of 7%, which was lower than that reported by Paulson and Bazemore[16] at 11%.

Paulson and Bazemore[16] and Cameron et al.[17] in their meta-analyses urged caution when interpreting prevalence findings. Both Paulson and Bazemore[16] and Cameron et al.[17] reported that the heterogeneity in the published rates of paternal depression was statistically significant and large in magnitude ($Q=970.179$, $p<0.001$, $I2=92.476$, $\tau2=0.346$)[16]; ($Q=825.081$; $P<.001$;$I2=94.910$; $\tau 2=0.470$).[17] Paulson and Bazemore[16] reported that there is a potential for bias in their results due to methodological weaknesses in the studies included in their meta-analysis.[16] The majority of studies included in their meta-analysis were cross-sectional, descriptive studies that used convenience sampling thereby increasing the risk of selection bias and yielding a sample that is less representative of the target population.[16,17,27] While the prevalence estimates from both meta-analyses suggest that depressive symptoms in fathers during the perinatal period are well above the estimated 4.7% prevalence rate in the male adult population, further research with more robust methods are needed before a definitive conclusion can be made. [16,17,28]

Measurement Tools Used to Assess PPND

Currently, there is no measurement tool specifically designed to screen for PPND.[18] This has lead clinicians and researchers to use measurement tools that have been developed for screening for the risk of depression in the general population outside the perinatal

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period, and among women in the perinatal period.[17] Some of the tools used to screen for symptoms of PPND include the Edinburgh Postnatal Depression Scale (EPDS)[30]; Beck Depression Inventory (BDI)[31]; Centre for Epidemiological Studies Depression Scale (CES-D)[32]; General Health Questionnaire (GHQ)[33] Hospital Anxiety and Depression Scale (HADS)[34]; Gotland Male Depression Scale (GMDS)[35]; and the Depression Anxiety Stress Scales (DASS).[36]

Using these measurement tools to screen for PPND symptoms exposes inherent diagnostic limitations and challenges.[37] For example, measurement tools developed to screen for depression in the general population include items such as diminished sleep and increased fatigue, which are a normal part of fatherhood in the perinatal period. This may increase the risk of false positives during screening, which could result in unnecessary additional diagnostic workups, potential adverse effects of labelling, and increased stress, anxiety and concern for fathers and their families.[37] On the other hand, measurement tools that have been developed specifically for women in the perinatal period focus on traditional depressive symptoms such as sadness and crying which are at odds with societal ideals of masculinity, and therefore men may be reluctant to report experiencing these symptoms.[38] Furthermore, men's experiences of depression tends to manifest with symptoms such as anger attacks and acting out, acting abusively towards others, abusing alcohol/drugs, and risk-taking behaviour.[39,40] These items are not currently included in the screening tools developed for women in the perinatal period.[37] This may lead to the under detection of fathers who are experiencing symptoms of depression and can result in fathers not getting the supports that they need.

The most commonly used measurement tool to assess for paternal perinatal depressive symptoms is the EPDS.[17,18] Cameron et al.[17] reported that 40 of the 74 studies included in their meta-analysis used the EPDS. The EPDS was developed to screen for maternal postnatal depressive symptoms in the postnatal period. Since its inception, the EDPS has also been used to assess antenatal depressive symptoms and anxiety symptoms across the perinatal period. The EPDS consists of 10 self-report items.[41,42] Each item is scored from 0 to 3, yielding a total range of 0–30.[30] The cut-off score of the original EPDS for risk of depression was suggested as 12/13.[30] Thorpe et al. (n=267)[43] published the first reported study assessing PPND using the EPDS in 1991.

To further research in the area of PPND and to identify fathers who need psychological support, it is of paramount importance that the tools used to screen for PPND such as the EPDS are valid and reliable. Several validation studies of the EPDS for use with fathers have been undertaken.[44,45] The first validation study was conducted in 2001.[44] In the study, 208 fathers completed the EPDS, the CES-D and were interviewed in their own home, using the Diagnostic Interview Schedule (DIS). Correlation (Spearman's r) between the men's self-report forms (EPDS and CES–D) was 0.62 (N=213, p<0.001; 95% C.I.=0.59 to 0.86) which would indicate that the EPDS is not measuring a mood construct in fathers similar to the CES–D. These findings highlight the fact that the item content on older and more generalized scales may not be appropriate for clinical assessment or research on new fathers. Internal consistency (Cronbach's standardized alpha) of the EPDS for men was 0.81, which is similar to that obtained by Cox et al.[30] for the women (standardized alpha=0.87).[44] Receiver operating characteristics analyses indicated that when screening for major or minor depression, 9/10 is the optimum cut-off. At this score, 71.4% of depressed men and 93.8% of non-depressed men are correctly classified, with only 7% of the sample being misclassified.[44]

Edmondson et al.[46] (n=189) conducted the second validation study of the EPDS. Seven weeks after the birth of their infant, fathers completed the EPDS. Approximately 4–5 weeks later, fathers who scored >10 on the EPDS were interviewed in their own home using the Structured Clinical Interview for DSM-IV (SCID — Depression and Anxiety Disorders Sections). Edmondson et al.[46] found that fathers with depression (diagnosed by clinical interview) scored significantly higher on the EPDS than non-depressed fathers (depressed group Mean score = 14.79, SD = 3.41; non-depressed Mean score = 6.64, SD = 4.40; $U = 258.00$, $p < 0.001$). Using a cutoff score of >10, yielded a sensitivity (the proportion of true positives that are correctly identified by a screening test) of 89.5 and specificity (the proportion of true negatives that are

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correctly identified by a screening test) of 78.2, giving an overall accuracy of 79.4 (Chi2 = 27.2; $p < 0.01$). When Edmondson et al.[46] reran the analysis using an expanded database with more participants who scored ≤10 on the EPDS, the >10 cutoff yielded a sensitivity of 77.3 and specificity of 92.9. The sensitivity and specificity of a test are dependent on the cut-off value above or below which the test is positive.

Lai et al.[47] (n=551) compared the psychometric properties of the EPDS, the BDI, and the Patient Health Questionnaire — Depression Module (PHQ-9) in screening for PPND among Chinese fathers in Hong Kong. At 8 weeks, postpartum fathers completed the assessment tools. Clinical diagnosis of depression was established with the Structured Clinical Interview. The criterion validity of the instruments was evaluated against this clinical diagnosis. The EPDS had a diagnostic accuracy superior to the BDI and PHQ-9 in detecting PPND among Chinese men. With a cut-off score of ≥10, the EPDS had a sensitivity of 91%, a specificity of 97%, a positive predictive value of 57%, and a negative predictive value of 99%. Cronbach's standardized alpha of the EPDS was 0.87. Split-half reliability as measured by the Spearman–Brown coefficient was 0.84. These results are similar to the coefficients reported by Cox et al.'s (1987) validation study for women (α 0.87, Spearman–Brown = 0.88).[47]

Finally, Massoudi et al.[42] (n=882) assessed the validity of the EPDS and showed a good internal consistency of the test (α=.81). In this study, all fathers who returned a questionnaire with an EPDS score ≥10 (n = 215), as well as 112 controls with low EPDS scores, were invited to be interviewed by telephone. The control group was selected by including one low-scoring father (EPDS score 0–9), for every two fathers scoring high on the EPDS. Telephone interviews using the Primary Care Evaluation of Mental Disorders (Prime-MD) were performed by two experienced licenced clinical psychologists who were both blind to the fathers' questionnaire results. The Prime-MD is a short, structured interview schedule aimed at diagnosing mental disorders in primary healthcare. It conforms to the DSM-IV criteria and can be conducted by telephone. Massoudi et al.[42] reported that the weighted analyses showed that the optimal cut-off score when screening for major depression was ≥ 12, yielding a sensitivity of 100% (CI 63–100%), a specificity of 94.9% (CI 90–99%) and a positive predictive value (the probability that subjects with a positive screening test truly have the condition) of 20.0%. For major or minor depression, a cut-off score of ≥ 9 yielded a sensitivity of 66.0% (CI 52–74%), a specificity of 86.3% (CI 78–94%) and a positive predictive value of 23.8%.[42]

While there have been several EPDS validation studies for use with fathers, there have been different recommendations regarding the optimal cut-off score for detecting the risk of depression.[45] For example, Edmondson et al. (n=192)[46] recommended a cut-off score of 10/11. Similarly, an Asian by Lai et al. (n=551)[47] also recommended a score of 10/11 for detecting the risk of depression. More recently, two studies from Europe recommended higher cut-off scores. Massoudi[42] in their study of 882 Swedish fathers recommends an EPDS cut-off score of ≥12 for detecting the risk of depression, while an Italian study by Loscalzo et al. (n=102)[45] recommended a cut-off score of 12/13. Cameron et al.[17] in their meta-analysis reported that 6 different EPDS cut-off scores were used in the studies that they reviewed. Even though the EPDS is based on conventional depression symptoms, which are centered[45] on the prototypical female depressive experience, the evidence from the studies outlined above suggest that is both reliable and valid for use with fathers.[44–47]

Factors associated with PPND

Several sociodemographic variables such as paternal age,[48,49] lower education levels,[25] parity,[50] unplanned pregnancy,[14] and a history of depression[51] have been reported as risk factors for PPND, however, there is conflicting evidence.[16] Cameron et al.[17] in their meta-analysis reported that PPND was not conditional on the sociodemographic variables outlined above. They suggest that these findings may be due to the limited number of studies that reported sociodemographic factors in a way that allowed them to be used in their metanalysis.[17] For example, paternal depression has been reported to vary with age,[45] however, Cameron et al.[17] found that this was not the case in the studies included in their meta-analysis.[17] They examined the mean and median for age both as categorically and

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continuously variables, however, extreme age ranges within studies could not be evaluated due to reporting discrepancies. There was a lack of consistency in how ages were reported (e.g., >40, >45) and as a result, no value for older fathers could be calculated.[17]

Maternal perinatal depression has been reported as the most common predictor for PPND.[51,52,53,54] Matthey et al. (n=356)[55] was the first study to highlight and focus on the correlation between maternal and paternal depression when they reported that fathers whose partners have perinatal depression have a 2.5 times higher risk of been depressed when compared to fathers whose partners do not have depression symptoms. The correlation between mothers' and fathers' depressive symptoms may be because a couple's life activities are intertwined, with each partner's attributes such as mood, attitudes, behaviour, health, anxieties, and lifestyle affecting each other.[56] The correlation between maternal and paternal postpartum depression may also be due to common causal factors outside the family, such as social stressors, or it may be fact that men and women who are more vulnerable to depression are more likely to form relationships.[26] It may also be a case that the couple could be exposed to similar depressive risk factors such as an unplanned pregnancy.[26] When a father's partner is depressed, he experiences helplessness, confusion, frustration and uncertainty about the future, which increases the risk of perinatal depression.[57] Furthermore, when a mother is experiencing perinatal depression she may be physically and emotionally unavailable to both her infant and partner, which can result in fathers taking on extra responsibility for infant care, partner support, and management of the household.[58,59] Despite the strong evidence of the correlation between maternal and paternal depressive symptoms, Cameron et al.[17] did not find that maternal depression was a significant moderator of paternal depression across the perinatal period.

Many of the reported risk factors for PPND could be experienced by men in the general population who are not fathers, and these include unemployment,[25] lower income levels,[51] lower levels of perceived social support[60] and increased alcohol use.[61] However, it has been suggested that fathers in the perinatal period are more susceptible to these factors.[62] For example, living in rented accommodation has been identified as a risk factor for PPND,[25,63] and it is a risk factor for depression in the general population.[64,65] However, the problems of rented accommodation may be more pronounced during the perinatal period. The rental market is associated with poor housing conditions and a lack of stability of tenure[66] and the birth of an infant may highlight these problems and exacerbate concerns about the infant's health in poor housing, and increase stress and anxiety related to the insecure nature of renting.[66] Those living in rented accommodation are five times more likely to live in unfit housing than those in owner-occupied housing.[66,67] The findings from this review suggest that the factors associated with PPND are related to a complex interplay of individual, relational, social and environmental factors.[48] However, further research is needed to confirm many contributing factors such as parity, age, education and a history of depression,[16,17]as there are conflicting findings and the evidence is inconclusive.

Correlates of PPND

Depression experienced during any stage can be correlated with mental health, physical health, and relationships.[12,68] Fathers who are experiencing PPND also have the additional responsibility of caring for a dependent infant. Research among men in the general population, and in the perinatal period indicates that the onset and existence of mental health problems such as stress and anxiety are associated with depression.[69,70] For example, depression leads to decreased serotonergic activity and increased cortisol levels, which has been linked to stress and anxiety.[71,72] PPND also affects physical health. Loutzenhiser et al. (n=108)[73] reported that PPND leads to fatigue through a lack of sleep and emotional exhaustion. Parental fatigue is associated with lower parental competence (β=−0.17, $P < 0.005$), greater parenting stress (β= 0.21, $P < 0.005$) and more irritability in parent-child interactions (β= 0.11, $P < 0.005$).[74] Symptoms of fatigue can further compound the effects of depression by impairing physical, cognitive, and emotional function, disturbing social and family relationships, and increasing healthcare utilization.[75]

As well as the association between PPND and a father's well-being, there are numerous potential

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associations between PPND and the health and wellbeing of his partner and infant.[50] Approximately half of all fathers with perinatal depression have partners with perinatal depression.[41] One of the protective factors against perinatal depression is a partners support,[25] and low levels of support from her partner may cause a mother to become more vulnerable to depression.[76] This may be further compounded by the symptoms of the male depressive syndrome such as aggression/violence and alcohol and/or drug abuse.[77] Depressed fathers display less positive behaviours such as sensitivity, warmth and responsiveness and increased negative behaviours such as hostility and disengagement,[78] which all could increase the risk of mothers experiencing perinatal depression.

PPND is also associated with infant and child wellbeing and development.[79] Davis et al. (n=1746)[80] examined the association between PPND and parenting behaviours in fathers of 1-year-old children and reported that depressed fathers were more likely than non-depressed fathers to spank their child in the previous month (41% compared with 13%; P <.01), and less likely to read to their child ≤3 days in a typical week (adjusted odds ratio: 0.38 [95% confidence interval: 0.15–0.98]). Paulson et al. (n=4,109)[81] assessed PPND and language development and reported an association between PPND and subsequent later expressive vocabulary development (t= 2.34, p= .02, b = .11). Finally, van den Berg et al. (n=4426)[82] reported that infant crying behaviour at 2 months was associated with PPND. After adjustment for depressive symptoms of the mother and relevant confounders, van den Berg et al.[82] found a 1.29 (95% confidence interval: 1.09–1.52) higher risk of excessive infant crying associated with paternal depression.

PPND is also associated with economic costs.[83] In Australia, PPND is estimated to cost the government $16 million annually.[84] This cost is driven by hospital and primary service usage, other medical costs such as pharmaceuticals, disrupted employment and the impact of father's mental health difficulties on the family system.[85] However, the true economic burden is likely to be even greater as PPND is underscreened, underdiagnosed, and undertreated.[86] The fact that studies were undertaken in the United States, the Netherlands, Canada, the United Kingdom, and Australia demonstrates the universality of the findings, at least in Western countries.[17] The findings from this review show concordant evidence that the impact of PPND has serious consequences not only for fathers but also for his family and wider society.[16]

Interventions and Treatment Options for PPND

Most intervention studies and health services aimed at improving mental health in the perinatal period have targeted women.[48] Consequently, information on the effectiveness of these interventions is mother-focused.[85] Rominov et al.[85] undertook a systematic review of interventions targeting paternal perinatal mental health and identified 11 studies. Five studies reported on interventions to reduce and prevent PPND.[87–91] Only one of the five interventions showed a significant reduction in PPND.[85] Field et al. (n=156)[90] reported that fathers who undertook a partner massage programme, beginning in the 2nd trimester and lasting over 16 weeks had significantly reduced depression levels. In the intervention, expectant mothers received 20-minute massages twice per week, at home, from their partners. Post-intervention data collected at 32 weeks' gestation indicated that fathers in the massage intervention group had significantly reduced depression levels, as compared to the control group. Given men's lack of engagement with health services and the substantial barriers to care for fathers who experience perinatal depression, a focus on prevention rather than treatment as addressed in this study holds great potential for clinical effectiveness. The study also showed improved relationships between fathers and their partner and a decline in anger scores for fathers in the intervention group. These findings are of importance as decreased anger and improved relationships may be the result of decreased depression in fathers.[90] The other 4 interventions showed no statistical evidence of reducing or preventing PPND.[85] These interventions included childbirth classes,[87] antenatal psychosocial interventions on postnatal adjustment,[84] and father-inclusive/couple-based antenatal programs.[89,90] The limited success of interventions targeting PPND may be related to the fact that the majority of studies failed to consider the co-existence of mental health problems such as stress, anxiety, and depression. [85]

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While there is increasing recognition of PPND,[92] there is a paucity of literature on the specific treatment needs of fathers. O'Brien et al.[41] undertook an integrative review of treatment options for PPND and identified 13 studies. Evidence from the review suggests that there is a lack of supports and treatment options tailored specifically for PPND. The research literature relating to the treatment of depression in men, and the challenges that fathers face in the perinatal period, points to a model of care and treatment options that adopt a father-inclusive and father-specific focus.[41] Treatment options need to creatively inspire help-seeking behaviour in an extremely hard-to-engage population, offer flexible delivery options that do not overburden already distressed men, and provide a safe and informal environment for men to share their experiences and concerns.[41] Such interventions can provide support networks for fathers who may feel isolated and marginalized from the maternal focused health services provided at present. O'Brien et al.[41] concluded their integrative review by reporting that cognitive behavioural therapy, group work, and blended delivery programs, including e-support approaches were the most effective treatment options for fathers with perinatal depression. The findings from this review suggest that there is a lack of empirical evidence regarding effective interventions and treatment options for PPND, which limits the conclusions that can be made at this time. The review highlights the need for the development of evidence-based interventions that reduce the risk of PPND and provides fathers with treatments that are timely, gender-sensitive and acceptable.

Future Research

The findings from this review suggest that PPND contributed to and impacted on other areas of mental health issues such as stress and anxiety. The co-existence of depression and anxiety is recognized in the general population[93] and fathers during the perinatal period.[94] There is also research reporting the co-existence of depression and stress in the general population[95,96] and fathers in the perinatal period.[9] Currently, there is a paucity of research investigating the triple co-existence of paternal stress, anxiety, and depression in the perinatal period.[9,94] Research seeking to understand if the co-existence of stress, anxiety, and depression occurs and establishing its prevalence is important and necessary, as fathers may present with complex and mixed symptoms, making it challenging to identify and manage.[97,98] Also, the coexistence of stress, anxiety, and depression during the perinatal period may lengthen the course of each, sustain the existence, and result in the elevated intensity of distress and/or impact on fathers, and their families[94]

There is a lack of evidence related to interventions that reduce the risk of depression for fathers in the perinatal period.[41] Therefore, research is needed to establish which interventions are effective, and what is the best time during the perinatal period to implement them. However, caution needs to be taken when looking at interventions to reduce the risk of depression as Rominov et al.[85] in their systematic review suggested that the limited success of the interventions that they reviewed may be primarily a result of the included studies failing to consider the co-existence of mental health issues such as stress, anxiety, and depression.

CLINICAL IMPLICATIONS

In contrast to previous generations, fathers are expected to be actively involved in the various phases of pregnancy, birth, infant care, and child-rearing.[99] With these shifts in contemporary fathering roles, it is important to consider how healthcare professionals (HCP) can promote the health of fathers. HCPs have many opportunities to include and involve fathers during antenatal consultations, scans, education classes, the birth of their infant and postnatal visits and clinics,[100,101] however, the available research suggests that they are slow to include and involve fathers.[102,103] This has resulted in fathers lacking information which in turn can increase their stress and anxiety.[8] In other areas of healthcare, there is evidence to suggest that providing information can significantly reduce emotional distress and improve psychological adjustment.[104] Therefore, HCPs should focus on including fathers in the perinatal period and providing them with the necessary information.

Traditionally the focus of antenatal care programs has been primarily on the mother's needs and concerns, which has resulted in fathers not feeling fully part of these programmes and not getting the information that they require.[48] To address this issue, antenatal classes exclusively for fathers have been developed.[105]

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Fathers value these classes as they provide an opportunity to discuss fears and roles, learn from others' experiences and ask questions that they would feel too embarrassed to ask in the company of women.[105] HCPs are well-positioned to advocate and initiate antenatal classes exclusively for fathers and include information about PPND into existing programmes.

Based on the research critiqued in this review there are several probable risk factors for PPND, however, the most significant risk factor is having a partner who is experiencing perinatal depression. [51,52,53,54] These findings should alert HCPs to be vigilant for fathers whose partner is depressed or who have screened positive on the EPDS, and when warranted assess her partner's mental health and general wellbeing.[48]

CONCLUSION

This paper provided a broad and comprehensive summation of the research literature related PPND. The findings from the review indicated that fathers experience depressive symptoms during the perinatal period, with prevalence estimates of nearly twice the rate in the adult male population. Research findings suggest that fatherhood in the perinatal period places men at a heightened risk of developing depression; however, further research with more robust methods are needed before a definitive conclusion can be made. While several probable risk factors for paternal perinatal depressive symptoms have been reported, the evidence is inconclusive concerning many of these factors such as paternal age, education level, parity, and history of depression. Maternal depression has been reported as the most common predictor for paternal depression, with fathers whose partners have depression themselves having a significantly higher risk of been depressed when compared to fathers whose partners do not have depression. The literature included in the review indicated that depression for men in the perinatal period harms fathers, their partner, and their infant. Higher levels of PPND contributed to mental health issues such as stress, anxiety, depression, and physical health issues such as fatigue. The review also highlighted that there is a lack of studies assessing the co-existence stress, anxiety, and depression of men in the perinatal period. In conclusion, the review points to a need to examine how we plan, provide and resource our health services for fathers in the perinatal period, to recognize the influence that pregnancy, birth, and fatherhood can have on men's mental health during this life stage.

DISCLOSURES

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