Journal of Affective Disorders 188 (2015) 60–67

Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Research report

Sociodemographic, pregnancy, obstetric, and postnatal predictors of postpartum stress, anxiety and depression in new mothers

Danielle Clout*, Rhonda Brown

Australian National University, Australia

ARTICLE INFO

Article history:
Received 15 July 2015
Received in revised form
24 August 2015
Accepted 25 August 2015
Available online 3 September 2015

Keywords:
Postpartum depression
Postpartum anxiety
Maternal stress
Risk factors

ABSTRACT

Background: The purpose of this paper was to evaluate relationships between sociodemographic, pregnancy, obstetric, and postnatal variables and postpartum depression, anxiety and stress levels in new mothers.

Method: One-hundred-thirty-nine women completed the baseline questionnaire and 105 completed the follow-up questionnaire at 4–6 months postpartum. Sociodemographic and pregnancy factors were assessed at baseline, birth and postnatal factors were assessed at time 2, and depression, anxiety, and stress were assessed at both time points.

Results: Caesarean delivery was associated with high postpartum depression, anxiety, and stress levels. Child sleep problems was related to depression, child health problems were related to anxiety, more SLE related to high stress, and maternal sleep problems were related to PPD. However, the results became non-significant after controlling for antenatal distress levels. Finally, women who underwent caesarean delivery had higher antenatal stress, anxiety, and depression levels, relative to women who did not undergo the procedure.

Conclusion: Psychological stress and distress tended to persist in the women from the third-trimester of pregnancy to 4–6 months postpartum. It tended to occur in the context of caesarean delivery, maternal sleep problems, child's health and sleep problems, and stressful life-events.

1. Introduction

Postpartum depression (PPD) is second only to caesarean delivery as the most common complication related to childbirth (Gregoire, 1995). In a recent Australian study, Woolhouse et al. (2014) found that 16.1% of women reported depressive symptoms during the first 12-months postpartum. In the PPD literature, prevalence estimates range from 3 to more than 25% of new mothers in the first 12-months postpartum (Dennis et al., 2004), depending on the sample characteristics, screening instruments, and statistical methods used (Gaillard et al., 2014; Le Strat et al., 2011).

Many women also experience significant postpartum *anxiety* (Don et al., 2014), which is a distinct clinical problem despite its high comorbidity with depression (Matthey et al., 2003; Miller et al., 2006). Maternal anxiety is reported to affect about 25–45% of new mothers (Britton, 2005; Faisal-Curry and Menezes, 2007), making it more common than depression in the perinatal period (Britton, 2008; Wenzel et al., 2003). Furthermore, Rallis et al. (2014) argue that maternal *stress* warrants further investigation as a distinct negative emotional state in new mothers, which is characterised by tension, chronic arousal and a degree of impaired functioning, as conceptualised by Lovibond and Lovibond (1995a) in the *Depression, Anxiety, Stress Scales-21* (DASS-21). The authors of the scale have attempted to reduce the degree of symptom overlap between the subscales to measure only the unique (and not comorbid) symptoms of each state. However, few studies have examined perinatal stress in new mothers. Thus, there is a need to examine comprehensively the psychological health of new mothers in the perinatal period, including factors that can predict the three affective states. Similar to the approach suggested by Rallis et al. (2014), we examined the three states using the DASS-21 as it is reported to have utility in assessing psychological distress in the perinatal period (Meades and Ayers, 2011).

Many studies have previously evaluated the risk factors for PPD (O'Hara and McCabe, 2013), including at least three meta-analyses (Beck, 2001; O'Hara and Swain, 1996; Robertson et al., 2004) and one systematic review (Pope, 2000). Currently, the best-established risk factors for PPD are a past history of depression, depression during pregnancy (Beck, 2001), poor marital relationship, and a lack of social support (Buist and Bilszta 2005; O'Hara and Swain, 1996; Pope, 2000). However, research evaluating the risk

* Corresponding author.
E-mail address: danielle.clout@anu.edu.au (D. Clout).

http://dx.doi.org/10.1016/j.jad.2015.08.054
0165-0327/

factors for anxiety is in its infancy, although the factors are reported to include prior psychiatric history, low socioeconomic status (SES), multiparous status, and stressful life-events (SLE) (Britton, 2008; Dipietro et al., 2008; Wenzel et al., 2005).

Many other risk factors have been examined for PPD and to a limited extent postpartum anxiety, including sociodemographics (e.g. income), obstetric risk factors (e.g. use of assisted reproductive technologies), and postpartum variables (e.g. feeding method) (Beck, 2001; Britton, 2008; McMahon et al., 2011; Fisher et al., 2012; Ystrom, 2012). However, as detailed below, the research has tended to yield conflicting results, and the risk factors for maternal anxiety and stress have rarely been elucidated. Thus, in this study, we examined sociodemographic, pregnancy, birth, and postnatal variables as potential risk factors of maternal depression, anxiety, and stress postpartum.

Sociodemographics have inconsistently been shown to be related to maternal distress. For example, younger age is related to worse PPD in some studies (Bottino et al., 2012; Petrosyan et al., 2011; Reck et al., 2008), whereas anecdotal reports suggest that older mothers are at greater risk (Carolan, 2005), and others studies report no significant relationship between age and PPD (McMahon et al., 2011; Smith and Howard, 2008). Similarly, SES (e.g. financial distress, low income, and education) (Rich-Edwards et al., 2006) was shown to be related to PPD (Beck, 2001; Fisher et al., 2012) and anxiety in some studies (Britton, 2008; Wenzel et al., 2005), but in others, it was unrelated to maternal distress (Smith and Howard, 2008).

Of *pregnancy* factors, parity has been explored as a risk factor for maternal mental health, although the studies have tended to yield mixed results. Some studies report that primiparous women were at greatest risk, especially if they were over 30-years of age (Brown and Lumley, 1994), whereas others failed to find any relationship between parity and PPD (Bågedahl-Strindlund and Monsen Börjesson, 1998; Josefsson et al., 2002). Recently, Paul et al. (2013) compared correlates of depression and anxiety and showed that primiparity was related to high state-anxiety levels but not high EPDS scores, suggesting that parity may be more strongly related to perinatal anxiety than PPD. However, in contrast, Henderson and Redshaw (2013) found no significant link between parity and anxiety during pregnancy. Additionally, women who had an unintended or unwanted pregnancy were shown to be at an increased risk of PPD (Cheng et al., 2009; Warner et al., 1996), possibly due to their high perceived stress and lack of social support, relative to those with planned pregnancies (Chou et al., 2008).

Obstetric and *birth* variables have previously been studied in relation to PPD. Assisted reproductive technologies (ART) including IVF were shown to be related to depression during pregnancy and the early postpartum, relative to women who conceived spontaneously (Monti et al., 2009). However, in a larger study, McMahon et al. (2011) found no increased risk of PPD in women who conceived using ART, supporting the results of a recent meta-analysis which failed to find a significant link between ART and PPD (Ross et al., 2011). ART has also been linked to postpartum anxiety such that women who used ART showed greater latent anxiety at 3-months postpartum and more manifest anxiety during the third trimester of pregnancy and 1-week after birth, relative to non-ART women (Monti et al., 2008). Furthermore, the relationship between type of delivery and PPD is not clear. Several studies have reported that caesarean delivery and assisted vaginal delivery were related to high PPD risk (Blom et al., 2010; Xie et al., 2011; Yang et al., 2011), whereas others including a large meta-analysis failed to find any support for the relationship (Adams et al., 2012; Carter et al., 2006).

Postnatal factors such as SLE, feeding method, sleep quality (infant and mother), and the baby's health have been evaluated as risk factors for PPD, of which perinatal SLE is reported to be the most robust indicator of PPD and anxiety (Boyce, 2003; Britton, 2008; Pope, 2000). However, the results for breast-feeding are inconsistent, with some studies finding that PPD is related to early cessation of or never breastfeeding (Turner and Papinczak 2000; Ystrom, 2012), whereas others failed to find support for the relationship (Chaudron et al., 2001; Wilkinson and Scherl, 2006). Similarly, breastfeeding cessation predicted an increase in postpartum anxiety in some studies (Ystrom, 2012), whereas others failed to find a difference in anxiety scores based on infant feeding method (Wenzel et al., 2005). Nonetheless, maternal sleep is known to be strongly linked to maternal mental health, especially regular continuous sleep between midnight and 6 am (Goyal et al., 2009). Similarly, infant sleep is known to be related to maternal PPD (Armstrong et al., 1998), although the direction of the relationship is unclear as some studies examined PPD as a risk factor for infant sleep difficulties (Armitage et al. 2009).

Finally, several studies have examined the relationship between infant health and PPD. In a recent study of over 107,000 women, Ban et al., (2010) found that perinatal depression was related to higher rates of gastrointestinal and lower-respiratory-tract infection in the infants. Similarly, maternal depression was shown to predict later infant health concerns (Gress-Smith et al., 2012), although the reverse association was not explored. Thus, in this study, we evaluated the child's current health using a 5-point scale ranging from excellent to poor, along with similar measures of infant sleep (4-point scale, large problem to no problem at all) and maternal sleep (5-point scale, very good to very bad) over the past month.

In summary, many factors have been examined as risk factors for PPD including sociodemographic, pregnancy, obstetric, and postnatal factors, although the results are mostly conflicting, and only a few studies have evaluated risk factors for postpartum anxiety and stress. Thus, in this study, we used a retrospective longitudinal design to examine relationships between a range of sociodemographic, pregnancy, obstetric, and postnatal variables and maternal depression, anxiety, and stress levels at 4–6 months postpartum. Consistent with the small available literature, we expected that:

1. Unplanned pregnancy, SLE, and infant and maternal sleep will be related to high depression levels; low income, multiparity, SLE, and ART will be related to high anxiety levels; and, more SLE will be related to higher stress levels in the new mothers.

2. Method

2.1. Participants

This study was conducted with full ethics approval from the Australian National University (ANU) Human Research Ethics Committee (Protocol Number 2010/650). Potential participants were indirectly recruited to the study via advertisements placed on a number of online parenting forums and social media sites (e.g. www.essentialbaby.com.au/forums/, www.facebook.com, and www.bubhub.com.au/community/forums/forum.php), and using email snowballing. The study inclusion criteria were age of 18 years or older, female gender, in a de facto or marital relationship, and in the third-trimester of pregnancy, either as a primiparous or multiparous expectant mother. No reimbursements were provided to the participants.

An *a priori* power analysis indicated that at least 103 participants were required, assuming a medium effect size ($f^2 = .15$), with alpha set at .05, power of .8, and up to 7 predictors. One-hundred-seventy-five women emailed the researcher (DC) and 139