



## Research paper

## Factors associated with postpartum depressive symptomatology in Brazil: The Birth in Brazil National Research Study, 2011/2012



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## ABSTRACT

**Background:** Depression is one of the most common postpartum mental disorders. Many socio-demographic and individual risk factors are associated with maternal depression but the impact of high levels of birth intervention is unclear. The Brazilian context is characterized by excessive intervention and frequent non-compliance with recommended obstetric protocols. This study therefore examined the impact of sociodemographic, individual, and obstetric risk factors in postpartum depression.

**Methods:** The Birth in Brazil research study is a national study of 23,894 postpartum women. Information about depression was obtained by telephone interview at 6–18 months after birth and was measured using the Edinburgh Postnatal Depression Scale.

**Results:** The prevalence of probable cases of depression was 26.3%. A multiple logistic regression model identified significant sociodemographic and individual risk factors as: brown skin color (OR=1.15 CI 1.01–1.31), lower economic class (OR=1.70 CI 1.41–2.06), alcohol use (OR=1.41 CI 1.09–1.84) and a history of mental disorders (OR=3.13 CI 1.80–5.44). Significant obstetric factors were unplanned pregnancy (OR=1.22 CI 1.05–1.43 for wanted later and OR=1.38 CI 1.20–1.60 for never wanted), multiparity (OR=1.97 CI 1.58–2.47 for 3 or more children), and poor care during birth (OR=2.02 CI 1.28–3.20) or of the newborn (OR=2.16 CI 1.51–3.10). Obstetric interventions and complications were not associated with maternal depression.

**Limitations:** Depression was measured only once so we are not able to examine the course over time. The associational and reverse causality cannot be ruled out for some variables.

**Conclusions:** The prevalence of postpartum depression is high in Brazilian women six months after birth. Poor care of women and babies during birth is more important in postpartum depression than physical obstetric or neonatal intervention and complications.

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### 1. Introduction

The birth of a child is generally seen as a moment of great joy and positive emotions. However, it paradoxically brings great transformations to a woman's life, with potential risk of psychological disorders (Dois et al., 2012). One of the most common disorders at this time is perinatal depression, which can manifest any time from the start of gestation or in the months after

childbirth (American Psychiatric Association, 2013). Symptomatology varies from mild symptoms to more serious forms. Postpartum depression is also associated with suicidal thoughts and maternal deaths by suicide (Howard et al. 2011; Lewis, 2007). The condition can persist for a year or more after childbirth and follow a chronic and recurrent course (Monti et al., 2008; Mayberry et al., 2007; Woolhouse et al., 2015; Santos et al., 2010). Postpartum depression can have various negative effects on the woman and her child and particularly on the establishment of the mother–baby bond, breastfeeding and the child's social, affective and cognitive development (Moehler et al., 2006). The effect of prolonged postpartum depression on the child continues to later phases of life and is associated with affective disorders in childhood and adolescence (Halligan et al., 2007; Santos et al., 2014).

Many risk factors have been identified for postpartum depression. Reviews suggest the strongest risk factors are a history of depression and/or depression in pregnancy, socioeconomic

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disadvantage and lack of support (Patel et al., 2012; Rubertsson et al., 2005). These risk factors appear to be stable across cultures. For example, a review of determinants of common perinatal mental health disorders in low and middle income countries identified socioeconomic risk, previous mental health problems, poor relationships with partner, family and friends, and adverse reproductive events as key categories of risk (Fisher et al., 2012).

Research on postpartum depression in Brazil identifies similar risk factors as research in other countries, with women with poor socioeconomic status, high parity, not living with their partner, previous psychological and/or psychiatric disorders, and unintended pregnancy at greater risk of depression (Silva et al., 2012; Melo et al., 2012; Moraes et al., 2006). However, very little research has examined the role of obstetric factors and intervention during childbirth as a risk factor for postpartum depression in Brazil.

Maternity care in Brazil is highly medicalized and obstetric interventions in labor and delivery are high, even among low-risk women (Leal et al., 2014). The cesarean section rate has been increasing in Brazil since the mid-1990s. In 2013 the rate of cesarean section was 55.6% (Brazilian Health Informatics Department (2014)). This was even higher in private hospitals where almost 90% of women gave birth by cesarean section (Domingues et al., 2014).

In addition, many hospitals in Brazil do not allow women to be accompanied by a partner or family member during labor and birth. This means women have to potentially cope with labor and birth, with associated high levels of intervention, in the absence of a known birth companion. It is noteworthy that in 2005 a Brazilian law was introduced to ensure all women have the right to have a companion of their choice with them at all times during labor and birth. This means that in many cases, hospitals are not complying with the law when they refuse to allow women to have birth companions (Diniz et al., 2014).

The impact of high levels of birth intervention in Brazil on women's postpartum mental health is unclear and may vary for different mental health outcomes. For example, there is fairly consistent evidence that cesarean is associated with an increased risk of women developing post-traumatic stress disorder following birth (Grekin and O'Hara, 2014). The evidence for obstetric intervention being associated with postpartum depression is less consistent and may differ between countries. A review of low and middle income countries found cesarean birth was associated with a 2.49–3.58 increased risk of postpartum depression (Fisher et al., 2012). However, a study of over 14,000 women in the UK found no association between cesarean birth and depression eight weeks postpartum (Patel et al., 2005).

Brazil is the seventh world economy, and it was classified as a high human development country in 2013 (UNDP, 2014). However, it has huge social inequities expressed by Gini Index equal to 0.527, according to estimates of the World Bank in 2015 (World Bank, 2015). The North and Northeast regions are poorer compared with South and Southeast and present important differences in dimension and kinds of health services. Despite being a multiracial society, brown (43%) and black (7.6%) people are the poorest contingent in the country as shown in 2010 Demographic Census. The skin color is associated with social and health inequalities, even controlled for other socioeconomic variables (Leal et al., 2005).

The aim of this study is to explore the association between a set of sociodemographic, individual and obstetric risk factors and probable maternal depression, from Birth in Brazil National Research Study. The cultural context plus the high rates of intervention during birth provide a unique context in which to examine the interplay between these potential risk factors and postpartum depression.

## 2. Methods

### 2.1. Sample and study population

This study is part of the Birth in Brazil Research, an investigation with countrywide representation carried out from February 2011 to October 2012 which involved 23,894 women who were recruited within 6 h of giving birth and followed up to 18 months postpartum. Data were also collected from women and babies' medical records.

Sampling was carried out in three stages. At first, all hospitals which had 500 or more births per year in 2007 were selected. These were classified according to Brazil's five macro-regions (north, northeast, southeast, south and center-west), municipality (capital or interior), and type of hospital (private, public and mixed). Subsequently, the number of days needed to reach the fixed sample of 90 women who had recently given birth in each hospital was calculated. Because smaller hospitals often schedule cesarean births for a particular day, this period had to be a minimum of seven days in each hospital to ensure representative samples were recruited. Finally 90 women who had recently given birth were selected from each hospital remaining in the sample. The final sample was recruited from 266 sampled hospitals in 191 municipalities, including all state capitals. A total of 1356 (5.7%) postnatal women selected were replaced, 15% due to early hospital discharge and 85% due to refusal to participate.

Postnatal women who gave birth to a live newborn, regardless of weight or gestational age, or to a stillborn baby with birth weight  $\geq 500$  g and/or gestational age  $\geq 22$  weeks of pregnancy in one of the eligible hospitals were invited to participate in this study. The study excluded women who delivered at home or foreigners who did not understand Portuguese language. Before beginning the interview a Free and Informed Consent Form (FICF) was read and after women gave their consent they received a copy containing all details of the research and contact information for the coordinators.

Women took part in three interviews and data were also collected from medical records. In the first phase face-to-face interviews were conducted with the women during hospitalization, data were taken from the mother and child's medical records, and the women's prenatal medical notes were photographed. As this was a complex sample a calibration procedure was used, along with sample weights to ensure coherence between the sample estimates and the known population totals obtained by an external source.

In the follow-up phase, women were interviewed by telephone the first 45 days after birth ( $n=16,109$ ; 68% response rate) and between 6 and 18 months after birth ( $n=11,925$ ; 49.9% response rate) to collect data about maternal and infant outcomes. The average time between the baseline study and the first telephone interview was 90 days, and between the baseline and second telephone interview was 12 months. As it was not possible to contact all the women who took part in the baseline interviews at the hospitals a logistic regression model was adjusted to estimate the probability that each woman who took part at baseline would answer the telephone interview, using a set of variables which differentiated the groups of respondents and non-respondents. Non-response adjustment factors attempt to compensate for the tendency of women having certain characteristics (such as being unmarried or of lower education) to respond at lower rates, affecting the probability of response in a specific stratum (see [Supplementary material](#)). On the basis of this model, specific sample weights were calculated for the analysis of the telephone interviews. The rationale for applying non-response weights is the assumption that non-respondents would have provided similar answers, on average, to respondents' answers for each stratum and adjustment category.

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