



## Is insomnia in late pregnancy a risk factor for postpartum depression/depressive symptomatology?

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### ABSTRACT

The aim of the present work was to investigate if insomnia in late pregnancy is a risk factor for postpartum depressive symptomatology/postpartum depression (PPD). 581 women in their last trimester of pregnancy answered questions/questionnaires about lifetime history of insomnia, current sleep perception, current mood and depressive symptomatology. They were interviewed with the Portuguese version of the Diagnostic Interview for Genetic Studies. After delivery 382 (65.7%) mothers participated again in the study. Insomnia in pregnancy was not a risk factor for PPD (DSM-IV or ICD-10) but was a significant predictor of postpartum depressive symptomatology. Negative Affect (NA) was a significant predictor of postpartum depressive symptomatology. Women with higher NA were 4.6 (CI95% = 1.69–12.74) and 5.3 times (CI95% = 2.26–12.58) more likely of experiencing PPD (DSM-IV/ICD-10, respectively) than women with lower NA. Lifetime Depression was a significant predictor of postpartum depressive symptomatology and ICD-10/PPD (OR = 2.6; CI95% = 1.16–4.38). Positive Affect (PA) showed to be a protective factor for postpartum depressive symptomatology and DSM-IV/PPD (OR = 1.5; CI95% = 1.20–2.33). Controlling NA, PA and Lifetime Depression, insomnia lost its predictive role, suggesting these variables might work as mediators. Associations between insomnia, NA, PA and Lifetime Depression should be assessed in pregnancy. This might help to preventively target NA, enhance PA and reduce the likelihood of experiencing postpartum depressive symptomatology.

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### 1. Introduction

Insomnia is one of the most prevalent health problems in the general population worldwide (Morin et al., 2006; Ohayon, 2002). It may be defined as both a symptom and a disorder, according to the *International Classification of Sleep Disorders – Second Edition (ICSD-2, 2005)*. As a symptom, it implies one or more of the following: difficulty initiating or maintaining sleep, waking from sleep too early, and/or the complaint of nonrestorative sleep. As a disorder/syndrome (primary insomnia), these sleep difficulties must occur in association with a complaint of impaired daytime functioning (e.g. diminished vocational functioning) and in the presence of adequate opportunity to sleep (ICD-10, 1992; APA, 1994; ICSD-2, 2005). When insomnia arises as a symptom in medical or psychiatric conditions, there is the need for a separate diagnosis and the sleep problem is considered a secondary insomnia (American Academy of Sleep Medicine, 2005; American Psychiatric Association, 1994; World Health Organization – WHO, 1992). While ICD-10 (1992) criteria state that the insomnia

complaint must be present for at least three nights per week for a period of one month, the DSM-IV (1994) requires the duration of sleep complaints for a period of one month or longer and the ICSD-2 (2005) general criteria for insomnia do not specify a frequency and a duration for the insomnia symptoms.

There is a general consensus emerging from population-based studies that approximately 30% of various adult samples drawn from different countries report insomnia symptoms (Bixler et al., 1979; Klink and Quan, 1987; Ancoli-Israel and Roth, 1999; Chevalier et al., 1999; Ohayon, 2002; Morin et al., 2006). When considering the Insomnia Syndrome, the estimates decrease to 9–15% (Breslau et al., 1996; Ford and Kamerow, 1989; National Institutes of Health State of the Science Conference Statement on Manifestations and Management of Chronic Insomnia in Adults, 2005; Ohayon, 2002).

In pregnancy, 66% to 94% of the women reports sleep disturbances (Schweiger, 1972; Suzuki et al., 1994). In National Sleep Foundation's (1998) Women and Sleep Poll, most of the pregnant women (78%) complained about disturbed sleep. Moreover, they complain about the fact that their sleep is worse during pregnancy than in any other time of their lives (Lee, 1998; Santiago et al., 2001). According to the literature (Santiago et al., 2001; Wolfson and Lee, 2005) sleep disruption is more prevalent in the third trimester (late pregnancy)

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mainly as a result of the major physiological and psychological changes.

Several studies have showed an association between insomnia and high levels of depression. This pattern is found when considering only the presence of depressive symptomatology (Foley et al., 1995; Kalogjera-Sackellares and Cartwright, 1997; LeBlanc et al., 2007; Lindberg et al., 1997; Shaver and Paulsen, 1993; Taylor et al., 2005; Vgontzas et al., 1998) as well as when a clinical diagnosis is present, either on longitudinal or cross-sectional studies (Bonnet and Arand, 1997; Edinger et al., 1988; Ford and Kamerow, 1989; Hauri and Fisher, 1986; Jansson and Linton, 2007; Morin, 1993; Morin and Ware, 1996; Ohayon et al., 1998).

Riemann et al. (2001) draw attention to the fact that the relationship between depression and insomnia symptoms/syndrome is “not a one-way street” (p. 67), as it used to be thought, acknowledging the importance of bidirectionality. The close bidirectional relationship between sleep and mood seems to arise from their common neurobiological and physiological underpinnings (Germain and Thase, 2008).

Various epidemiological studies illustrate that insomnia is a typical symptom of depression, being frequently reported by depressed patients. Also, objective indices of sleep disruption and of neurobiological alterations during sleep are consistently observed in depressed patients (Germain and Thase, 2008).

The other way around, insomnia might be viewed as an independent risk factor for developing depression (Riemann and Voderholzer, 2003; Buysse et al., 2008). Sleep disruption affects mood regulation in healthy individuals, with mood disturbances being a consequence of sleep deprivation in these subjects (Banks and Dinges, 2007; Durmer and Dinges, 2005). People with primary sleep disorders have high rates of depression and those with more longstanding sleep difficulties are at increased risk of developing clinical forms of depression (Germain and Thase, 2008). Time sequence analyses suggest that insomnia precedes onset of depression in most cases (Buysse et al., 2008; Johnson et al., 2006; Ohayon and Roth, 2003). As many as 40% of depressed patients report that insomnia preceded the onset of a first depressive episode and 56% that it preceded depression recurrence (Ohayon and Roth, 2003). Longitudinal studies have also consistently found that individuals who report insomnia are at increased risk of developing new or recurrent depressive episodes during prospective follow-up (Mallon et al., 2000; Riemann and Voderholzer, 2003; Buysse et al., 2008). Sleep disturbances and especially insomnia can, then, or must be, seen as risk factors for depression onset/recurrence (Germain and Thase, 2008).

Pregnancy has been well recognized as a period of major physiologic, physic and psychological changes (Karacan et al., 1968; Lee and Gay, 2004; Santiago et al., 2001; Schweiger, 1972), which can be viewed as a stressful event (Dimsdale et al., 2000; Geller, 2004; Riecher-Rössler and Rohde, 2005; Somers et al., 2006; O’Keane and Marsh, 2007). Following a cognitive model of insomnia (Harvey, 2002), in susceptible women, who might possess certain psychophysiological traits (such as psychophysiological arousal or a tendency to worry or anxiety) some of the typical sleep changes experienced in pregnancy (more prevalent in late pregnancy, as mentioned) may be experienced with a higher level of severity (Azevedo et al., 2008). These changes have been shown in studies using objective sleep methods (Coble et al., 1994; Driver and Shapiro, 1992; Karacan et al., 1968; Lee et al., 2000; Matsumoto et al., 2003), based on subjective perceptions (Evans et al., 1995; Mindell and Jacobson, 2000; Wolfson et al., 2003) and using both objective and subjective assessments (Wulff and Siegmund, 2000). These typical changes include more time awake during the night because of frequent night awakenings, difficulty falling asleep, more napping during the day, all of these related to the worsening of the insomnia symptoms and frequently resulting from the physiological changes associated with this specific period of life (leg cramps, increased need

to urinate, discomfort with sleeping positions, foetus movements) (Hertz et al., 1992; Karacan et al., 1968; Karacan et al., 1969; Lee, 1998; Santiago et al., 2001; Schweiger, 1972; Suzuki et al., 1994; Wolfson and Lee, 2005). The sleep alterations might progressively lead to a concern about not sleeping well and a concurrent elevation of women autonomic, emotional and cognitive arousal. Women start to get increasingly anxious, frustrated and more aroused as they worry about sleep. Also, in this period they tend to anticipate the labour, which contributes to higher anxiety levels. All these aspects will worsen the sleep problem in pregnancy, resulting in psychological distress (Azevedo et al., 2008). Furthermore, and as mentioned by several authors, sleep problems might persist until the postpartum, due to the baby sleep rhythms and feeding needs (Hiscock and Wake, 2001; Lee, 1998; Lee and DeJoseph, 1992; Wolfson and Lee, 2005).

Some authors refer to the fact that sleep patterns in late pregnancy are associated with more depressive symptoms in the first few weeks post-delivery (Wilkie and Shapiro, 1992; Wolfson et al., 2003). To answer the question if sleep disturbances/insomnia are risk factors for depression, longitudinal epidemiological studies are needed (Buysse et al., 2008; Germain and Thase, 2008). Pregnancy and postpartum periods are particular good times to investigate this association, offering the opportunity to follow the temporal development of depressive symptomatology/disorder. In this longitudinal study we wanted to analyse if insomnia in pregnancy was a risk factor for depressive symptomatology, following a dimensional approach, but also for postpartum depression, following a categorical approach. We considered both approaches, since in line with the present knowledge, both are still necessary for diagnosing psychopathology (Helzer et al., 2006). Although our main focus was antenatal/late pregnancy insomnia, we also considered some of the most well established risk factors for postpartum depression/depressive symptomatology: lifetime history of depression and the presence of depressive/anxious symptomatology (Negative Affect) in pregnancy.

## 2. Methods

The project was approved by the Ethic Committee of the Faculty of Medicine, Coimbra.

### 2.1. Procedures

Women with uncomplicated pregnancies in their last pregnancy trimester were approached while waiting for their medical appointment at local health medical centres, local maternities and childbirth preparation classes and invited to participate in the study. Aims and procedures were explained, confidentiality was assured and written consent was obtained.

Participants were asked to answer a booklet including questions about their demographic characteristics such as parity, marital status, age, work status; questions on their lifetime history of insomnia; and questionnaires on their current sleep perception, current mood and depressive symptomatology.

Women were interviewed in person using a semi-structured diagnostic psychiatric interview, the Portuguese version of Diagnostic Interview for Genetic Studies (DIGS; Azevedo et al., 1993; Nurnberger et al., 1994) adapted to pregnancy, which took approximately 20 min to complete.

After delivery, women who had given written consent to be followed up until a posterior stage of the study (in postpartum) (T1), were contacted by phone 3 months after delivery to set up an appointment. These meetings frequently took place at the mother’s Local Medical Centre (most of the times when the mothers took their babies for vaccination) or at their homes. They were asked to fill in a similar booklet and were again interviewed with the DIGS (Azevedo et al., 1993; Nurnberger et al., 1994), now adapted to the postpartum period.

### 2.2. Sample

Our sample comprised a total of 581 pregnant women with a mean age of 29.8 years (S.D. = 4.53; range = 18–44) in their last trimester of pregnancy ( $M = 32.6$ ; S.D. = 3.49 weeks of gestation; range = 25–41). The majority of women was married (74.5%), 15.3% were living with a partner and 8.8% were single/never married. 63.6% were nulliparae, 31.1% primiparae and 5.3% multiparae. Most of the sample included women with a low to middle educational level (53.2%). Approximately 60.6% of women were working, 26.4% were on medical leave and 13.1% were unemployed.

After delivery, 382 mothers (65.7%) continued to participate in the study (babies mean age when mothers were interviewed and filled in the questionnaires = 3 months,

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