

# Study of the Relation between Sleep Disorder and Depression at Late Stage of Pregnancy

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## Abstract

Women are subject to depression during pregnancy in the childbearing age, which is associated with serious complications for the mother, fetus, infant and the family. Its cause is not known. Recently, sleep disorder has been on the focus as causing depression. This study was conducted to determine the relation between sleep disorder and depression during pregnancy. This prospective describe-analytical study was conducted on the population of women admitted hospital of Tamin Ejtemaee in city of Hamedan in west of Iran in 2010. The study sample included 161 normal (non depressed confirmed by the beck test) pregnant woman who were selected by convenient non-probability methods. With a gestational age of 28-30 weeks, they were divided into two groups of sleep disorder and normal sleep by The Pittsburgh Sleep Quality Questionnaire. They were homogenized as for the confounders. On 38-40 weeks, sleep disorder was measured again and they completed the beck Questionnaire. 11.4% of women with normal sleep and 56.2% of women with sleep disorder (measured on the 28-30 weeks) were found depressed on 38-40 weeks and sleep disorder had increased the chances of depression by 9 times. ( $p < 0/001$ ) 14.6% of women with normal sleep and 56.9% of women with sleep disorder (measured on the 38-40 weeks) were found depressed and sleep disorder had increased the chances of depression by 7 times. ( $p < 0/001$ ) our findings indicated that sleep quality at early third trimester and late third trimester in pregnancy predicted higher levels of depressive symptoms at later stage in pregnancy.

**Keywords:** Pregnancy; Sleep disorder; Depression

## Introduction

Depression is the leading cause of disease-related disability [1]. It is common in most countries, with annual rates in the adult population ranging from 7% to 13% [2]. Depression is twice as prevalent in women as in men [3]. The mean age of onset of depression for females ranges from the early 20s to early 30s [2], coinciding with the childbearing years of a woman's life [4]. The notion that pregnancy is a time of joyful expectation, a satisfying and fulfilling experience for all women, has been exposed as a myth [1]. Rates of depression during pregnancy have been reported to be as high as 20% [5]. Depression could have devastating impacts not only on women but also on their children and family [4]. Untreated depression can lead to harmful prenatal health behaviours such as poor nutrition, poor prenatal medical care, smoking, alcohol or other substance misuse and risk of suicide, each of which compromises the health of both the woman and her fetus. Reviews have summarized the numerous adverse obstetric complications reported with untreated prenatal depression. These complications include pre-eclampsia, preterm delivery, low birth weight, miscarriage, small-for-gestational-age babies, low Apgar scores, neonatal complications and high neonatal cortisol levels at birth [6]. Interventions for depression during pregnancy most commonly include antidepressant medications and psychotherapy [5]. Given the intense concerns of women and their healthcare providers over possible teratogenicity and the behavioural impact of antidepressant use on the infant [2]. Given the high prevalence and serious consequences of antenatal, efforts have been made to identify risk factors to assist in prevention, identification and treatment [7]. Most observers consider socioeconomic status [3], unwanted pregnancy, marital conflict [5], young age, stressful life events and history of depression to be implicated in the development of depression, but there is little information available about biological factors. Sleep is an important part of life. Although sleep needs may vary by age and gender, the National Sleep foundation has recommended 7-8 h of sleep per 24h for adults. In a population-based study, hublin and associated reported

that 24% of women in the study experienced insufficient sleep compared to 16% in men [8], Sleep disturbances, which can include difficulties with sleep onset, maintenance, or efficiency are highly prevalent [9], sleep problems are frequently reported by pregnant women possibly because of the occurrence of pregnancy-related physical symptoms or discomforts (nausea, back pain, increased urinary frequency), hormonal changes, enlargement of the fetus, and/or shortness of breath [10], sleep disturbances are common during pregnancy as the result of physiologic, hormonal, and anatomical/physical changes [11]. Sleep disturbances can have detrimental effects on physical health and overall functioning. Emotional functioning and quality of life are also adversely impacted by sleep disturbances. One study finding that those with sleep difficulties were 17 times more likely to have clinically significant anxiety [9]. Given the negative implications of antenatal depression on health and wellbeing of mother and child, the current study aimed to examine prospectively the relationships among sleep disturbance and symptom of depression in hospital of Tamin Ejtemaee in city of Hamedan in west of Iran.

## Method

This prospective describe-analytical study was conducted on the population of pregnant women (mean gestation weeks=28-30) admitted to the maternity hospital of Tamin Ejtemaee in city of Hamedan in west of Iran during 11-month period in years of 2010.

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The sample consisted of 161 normal pregnant women (non depressed confirmed by the beck test) ranging in age from 20 to 35 years who were selected by convenient non-probability methods. Our exclusion criteria were as follow: preterm labor; preterm PROM, gestational diabetes, thyroid disorder, preeclampsia, history of infertility and still birth. Unplanned pregnancy, history of depression. All the subjects were explained about the purpose of the study and were ensured strict confidentiality. Written informed consents were taken from each of women.

All participants also reported their age, parity status, level of education, annual household income, marital status and history of abortion. Following University ethics approval, women currently 28 to 30 weeks pregnant were invited to participate in a study. At this time, women completed the questionnaire package, reporting on the previous 4-week period for sleep quality. They were divided into two groups of sleep disorder (n=88) and normal sleep (n=73) by The Pittsburgh Sleep Quality index. The PSQI measures quality and patterns of sleep, including difficulties related to subjective sleep quality, latency, duration and disturbance, habitual sleep efficiency, use of sleep medication and daytime sleep dysfunction over the past month. Total PSQI has demonstrated good internal consistency as well as good convergent and divergent validity in pregnancy [12]. They were homogenized as for the confounders.

With a gestational age of 38-40 weeks, participants complete by The Pittsburgh Sleep Quality index again they were divided into two groups of sleep disorder (n=65) and normal sleep (n=96). In this time, Depression was assessed using the short version Beck Depression Inventory (BDI) that has demonstrated concurrent validity and good internal consistency [13], the short form of the BDI correlates 0.89 to 0.97 with the long form and has advantages over the long form because it omits all but 1 item (tiredness) from the full BDI that could be influenced by pregnancy hormonal changes (e.g., appetite, fatigue, body image). Twelve of the 13 items of the short BDI were administered, excluding an item relating to suicide. The 1 question that could reflect sleep disturbances or hormonal changes (“I get too tired to do anything”) was dropped for analyses to avoid inflated correlations.

The relationship between their depression and sleep disorder in 28-30 and 38-40 was assessed. SPSS (SPSS Inc., Chicago IL) statistical software was used for data analysis. All hypothesis tests were two-sided and P-values<0.05 were considered statistically significant x 2, t-test, mann Whitney, v-cramer and logistic regression were used to analyze the obtained data.

## Results

No statistically significant difference was noted in duration of marriage ( $5.72 \pm 3.13$  and  $6.29 \pm 2.58$ ), socioeconomic ( $0.05 \pm 1.02$  and  $0.05 \pm 0.98$ ), granida (44.9% and 48.2% no delivery), history of abortion (19.2% and 15.7%) and satisfaction of marriage ( $69.24 \pm 10.88$  and  $70.84 \pm 10.47$ ) between normal sleep and disorder sleep groups, respectively.

Participants age ranged from 20 to 35 years (M=26.42 years, SD=3.98 and M=26.72 years, SD=3.79) in the normal sleep and disorder sleep groups, respectively.

In Both group most were multiparous (66.7% in normal sleep and 61.4% in sleep disorder group).

At 28-30 weeks of pregnancy (early third trimester) 88 women were placed in normal sleep and 73 women in sleep disorder, 11.4%

of women with normal sleep and 56.2% of women with sleep disorder were found depressed on 38-40 weeks and sleep disorder had increased the chances of depression by 9 times ( $p<0/001$ ).

The results showed that a moderate relationship between sleep disorder at early third trimester and depression in the late stage of pregnancy ( $P<0/001$ ) and 21 to 29% due to depression is related to sleep disorder on 28-30 weeks (Table 1).

At 40-38 weeks of pregnancy (late third trimester) 96 women were placed in normal sleep and 65 women in sleep disorder, 14.6% of women with normal sleep and 56.9% of women with sleep disorder were found depressed on 38-40 weeks and sleep disorder had increased the chances of depression by 7 times ( $p<0/001$ ).

The results showed that a moderate relationship between sleep disorder and depression in the late stage of pregnancy ( $P <0/001$ ) and 18 to 25% due to depression is related to sleep disorder (Table 2).

## Conclusion

The results indicated that sleep disorder at 28-30 weeks gestation predicted, prospectively, increased depressive symptoms at 38-40 weeks also; sleep disorder at 38-40 weeks had increased the chance of depression.

This supported the proposed hypotheses and extended findings of our previous research suggesting that women’s experiences of sleep disorder may have clinical implications for the development of antenatal depression [14], expressed that sleep quality earlier in pregnancy may contribute to the development of higher levels of depressive symptoms later in pregnancy. Results of this study, according to our study [10], expressed similar results. Their Findings support the idea that sleep problems are prospective risk factors for increases in depressive symptoms during pregnancy. However, [15-17] has shown that sleep quality is an antecedent to depressive symptoms.

Unlike the results of recent studies, [18,19] has shown no relationship between sleep disorder and depression, conclusion that the relationship between sleep quality and depression may be more complex [19], suggest that elevations in pro-inflammatory cytokines, e.g. IL-6, and C-reactive protein (CRP) may be a consequence of insufficient sleep and that sufficient sleep may be necessary to mount an effective response to an antigenic challenge [20], showed that depressive symptoms are associated with elevations in circulating proinflammatory cytokines during human pregnancy.

Given symptoms of antenatal and postnatal depression are highly correlated; further research should evaluate the impact of antenatal

Depression on 38-40	Normal sleep on 28-30		Sleep disorder on 28-30	
	n	%	n	%
No	78	88.6	32	43.8
Yes	10	11.4	41	56.2
	88	100	73	100

**Table 1:** Comparison of depression on normal and disorder sleep groups (28-30weeks).

Depression on 38-40	Normal sleep on 38-40		Sleep disorder on 38-40	
	n	%	n	%
No	82	85.4	28	43.1
Yes	14	14.6	37	56.9
	96	100	65	100

**Table 2:** Comparison of depression on normal and disorder sleep groups (38-40weeks).

experiences of sleep disorder directly and indirectly *via* antenatal depressive symptoms.

The findings are limited as the postpartum period was not examined to explore the longer-term implications and relationships of earlier sleep quality with postpartum depressive symptom. Our findings indicate the importance of screening for the possible impact of sleep disorder in earlier stages, to enable early treatment and even prevention of the development of antenatal and postpartum depression.

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