

# The Relation between Prenatal Concerns and Sleep Quality of Pregnant Women in Triple Trimesters

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## ABSTRACT

**Background and Objective:** Considering the importance of good sleep quality during pregnancy and the adverse effects of poor sleep quality on mother before and after childbirth and also its adverse effects on the fetus and newborn, identifying the related factors to sleep disturbance is important. Therefore, this study was conducted to evaluate the relationship between prenatal and sleep quality in pregnant women.

**Methods:** The present cross-sectional study was done on 150 pregnant women who were referred to Baqiyatallah Hospital, Tehran, Iran. Convenience sampling method was used for choosing participants. Pittsburgh Sleep Quality Index (PSQI) and Prenatal Distress Questionnaire (PDQ) were used for gathering information.

**Results:** The prevalence rates of poor sleep quality in first, second and third trimesters were 36%, 54% and 62%, respectively. In all three trimesters, the newborn health parameter had the highest score and relationship score had the lowest score. There was a statistically significant relationship between prenatal concerns and sleep quality of pregnant women in all three trimesters of pregnancy ( $P < 0.05$ ).

**Conclusion:** We found the significant relationship between pregnancy concerns and sleep quality of pregnant women in all three trimesters of pregnancy, and this finding indicates the direct effect of pregnancy concerns on sleep quality during pregnancy. Therefore, it is necessary to plan and perform the necessary interventions to minimize the concerns of pregnant women.

**Keywords:** Sleep quality, Pregnant women, Pregnancy Trimesters, Concern

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## Introduction

Pregnancy is one of the life-threatening periods in which women are exposed to incompatible physical, psychological and social conditions and their physical and emotional needs increase. Therefore, there is a unique opportunity for mental disorders (1).

As pregnancy begins, women's sleep patterns change (2). Sleep disorder is one of the most common problems during pregnancy, with 79% of pregnant women worldwide suffering from it (3). Complaints about sleep are common during pregnancy, and women complain of sleep disorders such as difficulty sleeping, frequent waking, less nighttime sleep, poor sleep and drowsiness during

the day (4). Change in natural sleep patterns leads to dysfunction in daily activities, maternal exhaustion, increase of accident, increased anxiety as well as fright of child care and negative effect on accepting maternal role in the family (5, 6). Evidence indicates the significant association between abnormal sleep patterns and cardiovascular disease and mortality (7). Moreover, sleep disturbance during pregnancy is associated with the increase of fetal growth restriction and postpartum depression. The results of a study showed that the risk of gestational diabetes increases with poor sleep quality and shorter sleep duration during pregnancy (8).

Causes of sleep disorders in the first trimester are nausea, vomiting, low back pain and urinary frequency, in the second trimester are fetal movement and heartburn, and eventually in the third trimester are urinary frequency, low back pain, shortness of breath, leg cramp and itching. Poor sleep quality during pregnancy has detrimental effects on one's mood, cognitive function and overall well-being (9).

Pregnancy specific stress includes the fears and concerns relating their own health and the fetus, physical symptoms, alterations in body shape, adequate physical activity, connections with others, and labor and delivery conditions (9). Studies showed that pregnancy anxiety, can be predictor of birth outcome and is associated with earlier delivery (10). Li et al., showed that pregnancy-specific stress is the risk factor for disturbed sleep in pregnant women (11). However, evidence regarding the association between stress related pregnancy and sleep quality is rare and more evidence is needed in this regard.

Considering the importance of good sleep quality during pregnancy and the adverse effects of poor sleep quality on the mother before and after childbirth and also its adverse effects on the fetus and newborn, identifying the predictors of sleep disturbance is essential. Therefore, the present study was conducted to provide data regarding the association between prenatal concerns and sleep quality in pregnant women, to be able to recommend non-pharmacological therapies to prevent sleep disorders in pregnant women.

## Materials and Methods

### Study design and setting

This descriptive cross-sectional study was conducted on 150 pregnant women (including 50 women in each trimester) who were admitted to Baqiyatallah Hospital, affiliated to Baqiyatallah University of Medical Sciences, from October to December 2019. Non-random convenience sampling method was used for selecting the participants until all 50 pregnant women in all three strata were completed.

### Eligibility criteria

We enrolled 18 to 45-year-old healthy, low-risk pregnant women who were willing to participate in the study. Inability to answer the questions, addiction and mental disorders were considered as exclusion criteria.

The written consent was completed by all the participants. Ethical committee of Baqiyatallah University of Medical Sciences approved this study.

### Measurement tool

The demographic characteristics of participants including age, education and job were gathered through a research-made checklist. We used the Pittsburgh Sleep Quality Index (PSQI) in order to determine the sleep quality of pregnant women. PSQI assesses the patients' sleep quality in seven domains: 1) subjective sleep quality 2) sleep latency 3) sleep duration 4) sleep efficiency 5) sleep disturbance 6) use of sleep medication 7) daytime dysfunction, and finally global PSQI score is given (12). This questionnaire previously was applied in Iran with the acceptable reliability and validity (13).

Also, we used the Prenatal Distress Questionnaire (PDQ) to evaluate the concerns during pregnancy, regarding physical symptoms, relationships, parenting, medical problems, labor and delivery, and the health of the neonate (14). Reliability and validity of this questionnaire was previously approved in Iran (15).

### Statistical analyses

Descriptive statistics were described as mean (SD) for continuous variables and number (%) for categorical variables across participant's background. Qualitative data analysis was performed using Chi-square test and quantitative data analysis was performed using T-test. All statistical analyses were conducted in STATA version 14. The P-Value less than 0.05 was considered as significant level.

## Results

A total of 150 pregnant women were enrolled. Demographic characteristics of pregnant women in triple investigated trimesters are presented in Table 1. As shown, there is not a significant difference between three trimesters ( $P < 0.05$ ).

**Table 1.** Baseline characteristics of investigated pregnant women in triple trimesters

Variable	Trimester one (n=50)	Trimester two (n=50)	Trimester three (n=50)	P.Value
Age group (year)	18-24	13 (28.89)	32 (37.65)	0.64
	25-34	18 (40.00)	25 (29.41)	
	35-42	14 (31.11)	28 (32.94)	
Education	Diploma and less	13 (26.00)	13 (26.00)	1
	Academic	37 (74.00)	37 (74.00)	
Job	House keeper	39 (78.00)	42 (84.00)	0.74
	Employee	11 (22.00)	8 (16.00)	

In Figure 1, we compared sleep quality in triple trimesters, the percentage of poor sleep quality in

first, second and third trimesters was increasing and were 36%, 54% and 62%, respectively.

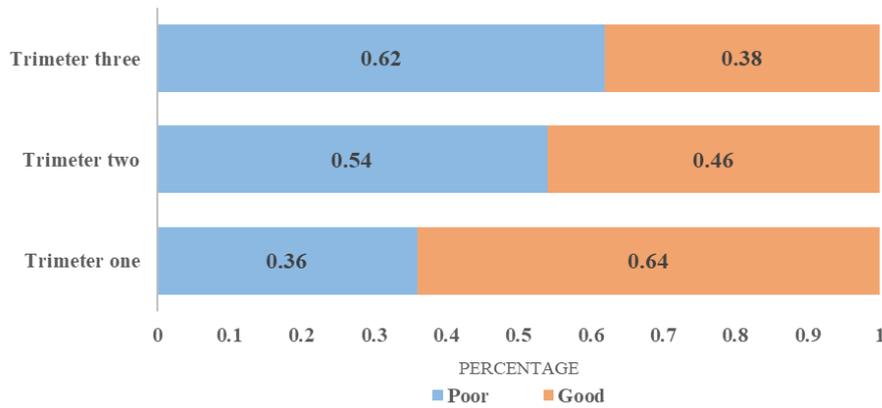


Figure 1. Status of sleep quality of investigated pregnant women in triple trimesters

The status of prenatal concerns of investigated pregnant women in triple trimesters is demonstrated in Figure 2. The percentage of low

prenatal concerns in first, second and third trimesters were 18%, 24% and 14%, respectively.

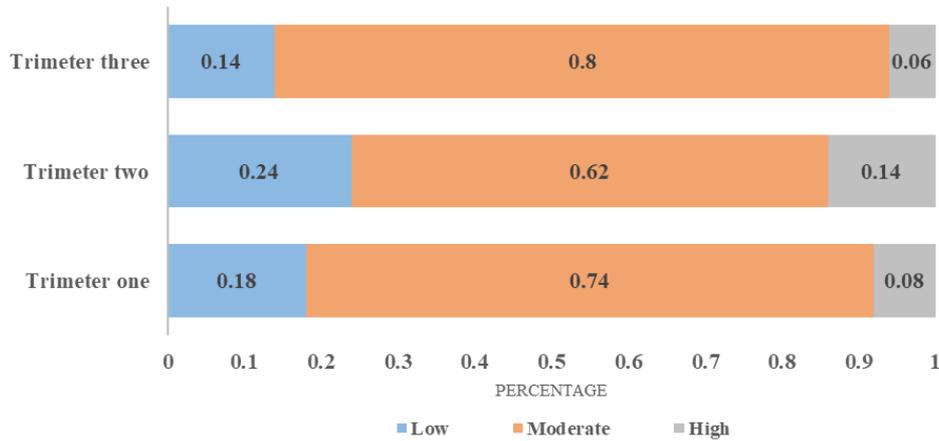


Figure 2. Status of prenatal concerns of investigated pregnant women in triple trimesters

In Figure 3, mean score of parameters of prenatal concerns in triple trimesters are compared. In all three trimesters, the newborn health parameter had the highest score and

relationship score had the lowest score. Newborn health and relationship concerns were higher in trimester two, while body image concern had higher score in trimester three.

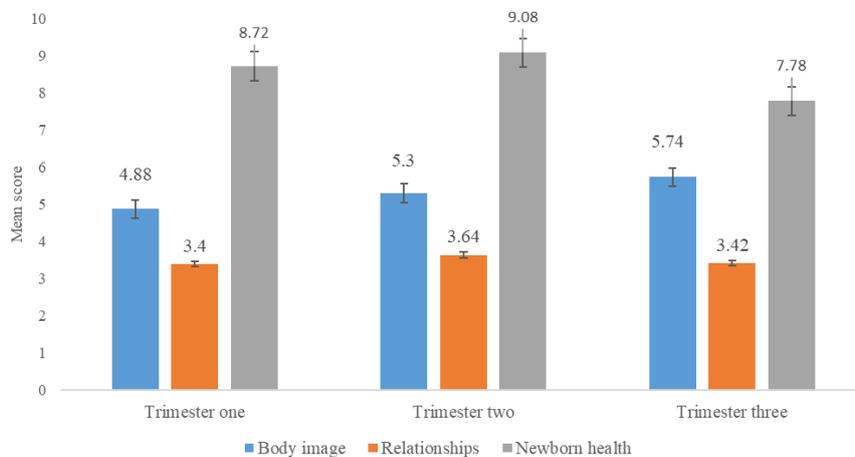


Figure 3. Mean score of parameters relating prenatal concerns in triple trimesters

As shown in Table 2, there is a statistically significant relationship between prenatal concerns and sleep quality of pregnant women in all three trimesters of pregnancy, so that

increasing of prenatal concerns was associated with increase the proportion of pregnant women with poor sleep quality ( $P < 0.05$ ).

**Table 2.** Association between prenatal concerns and sleep quality of pregnant women in triple trimesters

		Prenatal concerns			P.Value
		Low	Moderate	High	
Trimester one	Poor sleep quality	1 (5.56)	13 (72.22)	4 (22.22)	0.008
	Good sleep quality	8 (25.00)	24 (75.00)	0	
Trimester two	Poor sleep quality	2 (7.41)	18 (69.67)	7 (29.93)	0.001
	Good sleep quality	10 (43.48)	13 (56.52)	0	
Trimester three	Poor sleep quality	1 (3.23)	28 (90.32)	2 (6.45)	0.013
	Good sleep quality	6 (31.58)	12 (63.16)	1 (5.26)	

## Discussion

In this study, we investigated the association between prenatal concerns and sleep quality of pregnant women in triple trimesters among Iranian prenatal women. Pregnancy is one of the life-threatening periods in women's lives, thus providing a unique opportunity for mental disorders (1). Mental disorders in pregnancy have a major impact on the physical and mental health of the mother and her relationship with her child after childbirth (11). The necessity of adequate sleep during pregnancy is essential and the complications of inappropriate sleep in pregnant women before and after childbirth on their health, as well as in the fetus and newborn are undeniable.

The results of the study displayed that the poorest sleep quality in the third trimester, and the best sleep quality were in the first trimester. This indicates that as pregnancy progresses from the first trimester to the third, pregnant women will experience worse sleep. Moreover, the mean score of the prenatal concerns was highest in the second trimester, followed by the first trimester and lowest in the third trimester, respectively. This finding indicates that prenatal concerns in the second trimester are the highest and in the third trimesters are the least. Also, we found that there was a statistically significant relationship between prenatal concerns and sleep quality in all trimesters of pregnancy. This indicates that sleep quality during pregnancy is one of the factors affecting the level of pregnancy concerns.

We found that the poor sleep quality in pregnant women was noticeable, so that in first, second and third trimesters were 36%, 54% and 62%. Naud *et al.*, in their study found that 36.0% of pregnant women in their second trimester had poor sleep quality (16). In another study, 39% of pregnant women in 6-20 weeks of pregnancy had poor sleep (17). This high proportion of sleep disorders implies

of particular importance to pay attention to the quality of sleep of pregnant women.

Consistent with our finding, in Yu *et al.*, study (18) the strongest association was found between sleep quality and prenatal concerns at 2nd trimester. The justification for this finding may be due to that in the first trimester, the main cause of distress in pregnant women is nausea and vomiting and in the third trimester fear of delivery, discomfort of the fetus movements and newborn health are the main reasons of distress. While, in the second trimester, the above-mentioned stressors are not in priority and women feel more relaxed at this trimester. The relation between sleep quality and anxiety in this trimester was less confounded by those relevant negative events, and therefore, the strongest relationship was observed.

The negative effect of prenatal distress on sleep quality may be due to increasing cortisol developing response and hyperactive hypothalamus-pituitary-adrenal axis (19, 20).

However, this study had some limitations. First, was that pregnant women might have felt mentally distressed during completing the questionnaire with some effects on their answers, which was beyond the control of the researcher. Second, in addition to prenatal concerns, a number of other confounding variables may have affected sleep quality that were not considered in the present study. Moreover, the self-reporting of pregnant women in answering questions may be prone to information bias. Finally, in some studies (21) poor sleep quality has mentioned as the risk factor for mood disorders and given that our study is cross-sectional and the direct of association is unclear, therefore we could not judge about causality.

It is recommended that effective factors for the development of pregnancy concerns be studied comprehensively so that the effect of these factors and the occurrence of these concerns during pregnancy are minimized.

## Conclusion

The findings of this study showed that there was a statistically significant relationship between pregnancy concerns and sleep quality of pregnant women in all three trimesters and this finding indicates the direct effect of pregnancy concerns on sleep quality during pregnancy. Therefore, it is necessary to plan and perform the necessary interventions to minimize the concerns of pregnant women.

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## Ethical issue

IR.BMSU.BAQ.REC.1398.022.

## Conflict of interest

The author claimed no conflict of interest.

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