

Original Research Article

A study on assessment of sleep quality in south Indian pregnant women

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ABSTRACT

Background: Sleep disturbances are common during pregnancy. The risk of sleep disturbances is estimated to be two times higher in the later part of pregnancy compared to the early trimester. Thus, the present study was planned to assess the sleep quality in different trimesters of South Indian pregnant women.

Methods: This was a descriptive cross-sectional questionnaire-based study. A total of 90 healthy pregnant women with a mean age of 25 years were recruited and sleep quality was assessed using a standardized PSQI questionnaire. Mean global PSQI score of ≥ 5 is suggestive of poor sleep quality. A p value < 0.05 was considered statistically significant.

Results: Subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications and daytime medication were found to be significantly higher in the second and third trimester ($p < 0.0001$) pregnant women. Mean global PSQI score was ≥ 5 in the third trimester pregnant women.

Conclusions: The present study shows that the sleep quality is disturbed during pregnancy and it is more in the third trimester of pregnancy. Pregnant women should be aware of the effects of sleep deprivation and adverse outcomes related to it. Thus, proper identification of sleep disturbances and a good awareness on the cumulative effects of the risk factors associated with sleep deprivation during pregnancy will help the physicians to manage and prevent the adverse maternal and fetal outcomes.

Keywords: PSQI, Pregnancy, Sleep quality, South India, Women

INTRODUCTION

Sleep is essential for the normal growth and development of both mind and body. A good sleep is quiet important for a healthy pregnancy.^{1,2} Pregnant women need adequate sleep for the normal growth and development of the foetus and as such, there is also an increased need for sleep during pregnancy. Adequate sleep during pregnancy gives them the energy that they need for their labour and delivery process.^{3,4} Sleep disturbances and

sleep disorders are common during pregnancy.^{5,6} According to the National Sleep Foundation Women and Sleep poll, 79% of the pregnant women suffer from sleep disorders.⁷

Sleep disturbances have been observed right from the first trimester of pregnancy till the end of the third trimester.⁸ However, the percentage of sleep disorder and sleep disturbances are more in the third trimester of pregnancy.⁹ To our dismay, a change in sleep pattern is associated with adverse pregnancy outcomes both in the

mother and foetus.⁵ Thus, the poor quality of sleep is associated with increased risk of low birth weight, preterm baby, intra uterine growth retardation (IUGR), still birth, low APGAR score in the foetus and newborn. There is also increased maternal complication during pregnancy like preeclampsia, gestational diabetes as well as increased complications during delivery like prolonged labour and caesarean section.^{5,10} The previous study has reported that pregnant women sleeping less than 6 hours per day in their last month of pregnancy had prolonged labour and increased caesarean rates.^{1,10} Although several studies have assessed the sleep quality during pregnancy, most of these studies were carried out only in the western population. Moreover, only very few studies have compared the differences in sleep quality in different trimesters of pregnancies. To date, no such study has been conducted so far to compare the difference in the quality of sleep in different trimesters of pregnancy in South Indian pregnant women. Therefore, in the present work, we have planned to study the sleep quality in different trimesters of pregnancy in South Indian pregnant women.

METHODS

The descriptive cross-sectional questionnaire-based study was conducted in the Department of Physiology and Outpatient Department (OPD) of Obstetrics and Gynecology, IGMC and RI, Puducherry. After obtaining the approval from the Institute Research committee and Ethics Committee, a total of 90 healthy pregnant women of different trimesters were recruited from the OPD of Obstetrics and Gynecology of IGMC & RI. Convenient sampling method was used. Subjects with a history of multiple pregnancy, previous bad obstetric history, previous history of caesarean section, pregnant women with any medical or surgical illness, and women with any factors which affect the sleep quality like those with psychiatric disorders were excluded from the study. The entire procedure was explained to the subjects and written informed consent was obtained from all the participants prior to the initiation of the study.

Demographic profile like age, parity, gestational age (trimester of pregnancy), level of education, occupation, socio-economic status, height, weight and BMI were recorded. The subjects were requested to fill the Pittsburgh Sleep Quality Index (PSQI) questionnaire to assess their sleep quality. PSQI is a 19 item questionnaire which is freely available for use in the public domain. It is an effective instrument which is commonly used to measure the sleep quality in adults.¹¹ PSQI is a very simple questionnaire consisting of seven sleep components. The seven components of sleep includes, subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications and daytime medication over the last month. Each component has a score from 0-3. Global PSQI score is the sum of all these seven components. A global PSQI score of 5 or greater indicates poor sleep quality. The sleep disturbances are usually under-

reported.¹² Thus, by using this PSQI questionnaire, subjects can easily evaluate the seven components of sleep over the last one month. The mean and SD of each sleep component and global PSQI score was entered in a tabular column and the difference in the above sleep components was compared among the three different trimesters. For analysis, the obtained data were entered into the Microsoft Excel spread sheet. Variables were expressed as mean \pm standard deviation (SD) and frequencies in percentages. The analysis was done by one-way ANOVA (analysis of variance) using Graph pad In-Stat (Version 3, USA) software. Post hoc tests were performed by Tukey Kramer multiple comparison test. The difference was considered statistically significant if the probability of chance was less than 0.05 ($p < 0.05$).

RESULTS

At the end of the study period, a total of 90 healthy pregnant women participated in the study and completed the questionnaire. They were divided equally into three groups based on the gestational week (30 pregnant women in each trimester of pregnancy). The mean age of the subjects in the study was found to be 25.33 ± 4.21 and they range from 19-37 years. The mean height and weight of the study participants were 156.91 ± 5.57 and 62.53 ± 12.64 respectively. The mean systolic and diastolic BP was found to be 104.2 ± 18.03 and 69.53 ± 7.63 respectively. The mean Body Mass Index (BMI) was found to be 25.33 ± 4.6 . Around 68 (75.6%) of the pregnant women had good quality of sleep and nearly 22 (24.4%) had poor quality of sleep irrespective of their trimesters. Nearly 44% of pregnant women in the first trimester and 42.6% in the second trimester had good quality of sleep. On the contrary, nearly 95.5% of the women in third trimester had poor quality of sleep. There was a significant difference in subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication and day time dysfunction ($p < 0.0001$) in the third trimester when compared with that of the second trimester pregnant women. Similarly, while comparing with the first trimester, there was a significant difference ($p < 0.0001$) in all the seven components of sleep in the third trimester (Table 1).

When compared with the first trimester the subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication and daytime dysfunction ($p < 0.0001$) was found to be significantly higher in the second trimester. But this significant increase in all these seven components of sleep in the second trimester was less when compared with that of the third-trimester pregnant woman. The mean global PSQI score was significantly higher in the third trimester ($p < 0.0001$) when compared with that of the first and second trimester pregnant women. Though there was a difference in the mean global PSQI score between the first and second trimester, the difference was not significant. The mean global PSQI score was

5.30±2.103 in the third trimester. This shows that the pregnant woman in the third trimester have a poor sleep quality whereas in the first and second trimester the mean

global score was found to be less than 5 which indicates that the overall sleep quality seems to be good in the first and second trimester of pregnancy (Table 2).

Table 1: Mean pittsburg sleep quality index score with sleep component subscores in different trimesters of pregnancy.

Sleep assessment	First trimester (n=30)	Second trimester (n=30)	Third trimester (n=30)	P value
Subjective sleep quality (0-3)	0.22±0.04	0.98±0.14***	2.72±1.02***,fff	<0.0001
Sleep latency (0-3)	0.64±0.05	1.24±0.04*	3.57±1.44***,fff	<0.0001
Sleep duration (0-3)	0.34±0.02	1.54±0.42***	3.84±1.96***,fff	<0.0001
Habitual sleep efficiency (0-3)	0.32 ±0.01	1.86±0.71***	2.82±1.53***,fff	<0.0001
Sleep disturbances (0-3)	0.61±0.05	2.01±1.12***	3.02±2.04***,f	<0.0001
Use of sleep medication (0-3)	0.12±0.07	0.72±0.24**	1.80±1.06***,fff	<0.0001
Daytime dysfunction (0-3)	0.42±0.04	1.56±0.92**	4.12±2.07***,fff	<0.0001
Mean PSQI global score (n/21)	1.40±1.133	2.20±1.349	5.30±2.103***,fff	<0.0001

Data expressed are mean ± SD. Analysis of data was done by one - way ANOVA and post hoc by Tukey-Kramer test. The * represents comparison with first trimester, f represents comparison with second trimester. *p<0.05; **p<0.01; ***p<0.001. .fp<0.05; ffp<0.01; ffff<0.001

Table 2: Comparison of Mean PSQI scores among different trimesters of pregnancy.

Trimesters	Mean score	P value
First	1.40±1.13	0.0001
Second	2.2±1.35	
Third	5.3±2.1	

DISCUSSION

Sleep quality is altered and sleep disturbances are usually under-reported in pregnant women. Hedman et al, have conducted a survey and found that the mean hours of total sleep per 24hours before pregnancy was 7.8hours and increased to 8.2hours during the first trimester. Furthermore, there was a decrease in the sleep time during the second trimester to 8.0hours and it again decreased to 7.8hours in late pregnancy.¹³ The factors contributing to the alteration in the sleep quality during pregnancy are neurohormonal changes especially the increase in the progesterone level during pregnancy which can lead to excessive daytime sleepiness in the first trimester, age, parity, marital status, socioeconomic status etc.¹⁴ Thus, sleep disturbances are common during pregnancy and numerous researchers have focussed on exploring the factors affecting the sleep.¹⁵ This disturbance in sleep pattern varies from 13% to 80% in the first trimester and 66% to 97% in the third trimester.¹⁶ Even though the poor sleep quality is associated with adverse pregnancy outcomes both in the mother and the foetus, the sleep disturbances are usually under reported.¹⁵ To address this issue of under reporting, there are several inventories which can be used for assessing sleep quality but they provide only subjective evidence.

Thus, this study was undertaken with the intention to assess the sleep quality of pregnant woman in different trimesters using a standard sleep questionnaire (PSQI questionnaire) assessing the different domains of sleep. The results of our study show that a pregnant woman in the third trimester has a poor quality of sleep. Though the sleep quality was not altered in the initial months of pregnancy, mild sleep disturbances in the form increase in sleep latency, decrease in sleep duration etc were observed in the early trimesters of pregnancy. The findings of the present study were similar to the studies conducted by researchers in different population.^{7,17,18} In a meta-analysis conducted by Sedov et al, the average PSQI score during pregnancy was 6.07 and 45.7% of expectant mothers experienced poor sleep quality as defined by a PSQI ≥5 score. Similarly, in our study also the pregnant woman in the third trimester had a poor sleep quality whereas in the first and second trimester the mean global score was found to be <5 which indicates that the overall sleep quality seems to be good in the first and second trimester of pregnancy.¹⁷

It has been found that a better understanding of the quality of sleep and sleep disorders can reduce the incidence of adverse maternal and foetal outcomes among pregnant women.¹⁹ In a study conducted in Thailand pregnant women, it was found that proper sleep counselling to pregnant women by health care professionals may improve the quality of prenatal care.²⁰ But in our study, this issue was not addressed because of time limitations. Thus, education on proper sleep behaviour and improved awareness of sleep quality may help pregnant women to find effective strategies for identification and management of their sleep problems in their early pregnancy. In a study conducted by Wilson et

al, it was found that women in the third trimester of pregnancy had poor sleep efficiency, more awakenings, less stage 4 sleep, more stage 1 sleep and fewer minutes in rapid eye movement sleep than the control group.²¹ But in our study, we were not able to provide an objective evidence for alteration in the sleep pattern by the use of polysomnography because of logistic feasibility.

Our study attempted to explore the possibility of assessing the sleep disturbances among pregnant women at different gestational age. However, we have not assessed the pregnancy outcome of the subjects which could have given a better understanding of the adverse effects of sleep disturbances in both the mother and foetus. It was a subjective assessment of sleep quality and not an objective assessment.

Secondly, the sample size was also small which may be considered as one of the limitations of the study. In addition to this, we did not consider the confounding factors such as the age, socioeconomic status, culture and other co-morbid conditions like pregnancy induced hypertension, anaemia, diabetes mellitus etc. which may have a substantial effect on the study because of logistic feasibility. Hence further studies in a larger population are required for a better understanding of the overall influence of different factors on the sleep quality among pregnant women of different gestational age groups.

CONCLUSION

The present study shows that the sleep quality is disturbed during pregnancy and it is more in the third trimester of pregnancy. Pregnant women should be aware of the effects of sleep deprivation and adverse outcomes related to it. Thus, proper identification of sleep disturbances and a good awareness on the cumulative effects of the risk factors associated with sleep deprivation during pregnancy will help the physicians to manage and prevent the adverse maternal and fetal outcomes.

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