

Assessment of Sleep Quality and Nutritional Status of Antenatal Mothers—A Community-Based Study

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Abstract

Introduction: Sleep is an essential part of the overall well-being of health. Good quality of sleep is required for everyone to be free from physically, mentally, and socially caused disease and disability. The quality of sleep is more important during pregnancy where women are carrying one more life in their womb. Socioeconomic and demographic factors have a substantial effect on nutritional status and the food intake of women, especially pregnant and lactating women in the family. The available literature has highlighted the influence of factors such as women's education status, family size, and community to which a woman belongs on their nutritional status and intake. Very few studies highlighted the sleep pattern in the different trimester and nutritional score of pregnant women. Therefore, the present study was an attempt to evaluate the quality of sleep and nutritional status among pregnant women in field practice areas. **Materials and Methods:** The present study was a prospective cross-sectional observational study and was carried out in urban and rural field practice areas of the Department of Community Medicine. A total of 104 pregnant women from randomly selected households in both rural and urban areas were included in the study as a convenient sampling. Data on the quality of sleep were collected using standardized Pittsburgh sleep quality index scale from participants, and women dietary diversity score was collected by 24h diet history in their own language. **Result:** Of them, 75% have sleep difficulty with a score of >3; 54% of them were consuming more than six food groups in their daily diet. **Conclusion:** Our study concludes that an imbalance among antenatal mothers between resident areas related to nutrition score was due to literacy status, occupation, and the type of family of the antenatal mothers.

Keywords: Anthropometric measurements, Pittsburg sleep quality index, rural–urban, women's dietary diversity score

INTRODUCTION

Sleep is important for the normal growth and development of both mind and body. A quality sleep is quite important for a healthy pregnancy. Adequate sleep during pregnancy gives them the sufficient energy that is required for a delivery process.^[1,2] Sleep disturbances have been observed right from the beginning of pregnancy till the end of the delivery. The overall percentage of sleep disorder and sleep disturbances is more in the third trimester of pregnancy. The disturbance of sleep is associated with an increased risk of preterm baby, still birth, intrauterine growth retardation (IUGR), low APGAR score, and low birth weight, in the fetus and newborn.^[3]

A well understanding of duration and quality of sleeping during pregnancy will certainly help health professionals in improving health services and promoting timely

involvement to prevent adverse maternal and fetal outcomes among pregnant women.^[4]

The socioeconomic and demographic factors have a significant effect on nutritional grade and the food intake of women, especially pregnant and lactating women in the family. The available literature has highlighted the influence of factors such as women's education status, family size, and community to which a woman belongs responsible certain factors responsible for their nutritional status and intake.^[5,6]

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Received: 09-Jun-2022, **Revised:** 08-Dec-2022, **Accepted:** 20-Sep-2022,
Published: 27-Mar-2023

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How to cite this article: Udgiri RS, Sorganvi V. Assessment of sleep quality and nutritional status of antenatal mothers—A community-based study. *D Y Patil J Health Sci* 2022;10:161-5.

Access this article online

Quick Response Code:



Website:
www.dypatiljhs.com

DOI:
10.4103/DYPJ.DYPJ_47_22

A quality sleep pattern plays an important role in the preparation for birth and safeguards the baby from the psychological stress and strains of pregnancy. Expectant women need to sleep for at least 6h per day and at afternoon for 2h.

The precise nutrition during pregnancy supports suitable intrauterine growth of the fetus and normal birth weight, which can have life-long consequences for development. Women's dietary diversity scores (WDDS) have been demonstrated to be a good measure of household macronutrient adequacy and household nutrition insecurity.^[7]

Pregnancy is definitely a "hot period" for the programming of future conditions.^[8] Therefore, the present study was an attempt to know the quality of sleep and nutritional status of the pregnant women in the field practice area, as such study has not been undertaken in this part.

Objectives

The objectives of the study are:

1. To assess the quality of sleep in different trimester of pregnancy among pregnant women
2. To find the nutritional score of pregnant women.

MATERIALS AND METHODS

The present study was a prospective, cross-sectional observational study and was carried out in urban and rural field practice areas of the Department of Community Medicine, BLDE, Vijayapura. Before the start of the study, approval from the institutional ethical committee was obtained, and informed consent was taken from the study subjects. A total of 104 pregnant women from randomly selected households, both rural and urban (52 for each group), were included in the study as a convenient sampling.

The data related to sociodemographic profile, parity, and risk factors were collected, and also the data on the quality of sleep were collected using standardized Pittsburgh sleep quality index (PSQI) scale from participants in their own language.

Sample size

With anticipated proportion of sleep disorder among pregnant women (46.7%),^[9] the minimum sample size is 98 patients with a 5% level of significance and 10% absolute error.

Formula used was $n = z^2 p*q/d^2$.

Tool used

PSQI^[10]

It comprises 19 things and measures several different features of sleep, contributing seven component scores

and one composite score. The component scores consist of individual sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, the use of sleeping medication, and daytime dysfunction.

Each point is weighted on a 0–3 interval scale. The global PSQI score is then calculated by adding the seven component scores, providing a complete score ranging from 0 to 21, where lower scores denote a healthier sleep quality.

WDDS^[11]

It contains seven food groups, based on food items consumed in the past 24h; respondents were given the number of food groups they consumed, ranging from 0 to 9. Based on the distribution in the sample as recommended by food and agriculture organization: ≤ 3 food groups was considered as lowest dietary diversity, 4–5 food groups as medium dietary diversity, and ≥ 6 as high dietary diversity.

Other parameters

Height, weight, and mid-arm circumference are measured as per standard operating procedures.

Statistical analysis was done using SPSS version 20. Data were represented using mean \pm standard deviation, percentages, and diagrams. The association between variables was found using chi-square test. Correlation analysis was used to find the relationship between the variables.

RESULTS

In the present study, a total of 104 pregnant mothers with different trimester were participated both from the rural and urban field practice areas of our college. Among them, 52 belong to the rural area and 52 belong to the urban area.

In the rural area, the mean age group of participants was 23.83 ± 3.745 ; the mean age at marriage was 19.02 ± 2.825 ; and the mean duration of marriage was 4.88 ± 3.364 . A majority of them were homemakers (73%), 17% from them are illiterate, and 56% live in joint family; 37% of them were primigravida, and others were multigravida; 44% belong to the second trimester followed by the first and third trimester, respectively (33% and 23%).

None of the participants were practiced any family planning methods. A history of hyperemesis was observed only among 14%; 79% of them received tetanus toxoid immunization. 67% of them were consuming iron and folic acid tablets [Table 1]; 75% of them have sleep difficulty, with a score of >3 . MUAC measurement shows 67% of them were having <22 cm, showing under nutrition. Only 37% of them have consumed >6 groups of food item in their daily diet, followed by 4–5 food group (31%) and <3 food group (33%) [Table 2].

Table 1: Sociodemographic profile of antenatal mother in both rural and urban areas

S. no.	Rural		Urban	
	No	%	No	%
Age	23.83 ± 3.745		24.06 ± 4.840	
Age at marriage	19.02 ± 2.825		19.73 ± 3.249	
Duration of marriage	4.88 ± 3.364		4.567 ± 3.7613	
Occupation				
Agriculture	5	9.6	-	-
Business	2	3.8	7	13.5
House wife	38	73.1	40	76.9
Laborer	5	9.6	4	7.7
Service	2	3.8	1	1.9
Education				
Illiterate	9	17.3	1	1.9
Primary	2	3.8	-	-
Secondary	40	76.9	46	88.5
Pre University Course	1	1.9	-	-
Type of family				
Extended	2	3.8	-	-
Joint	29	55.8	40	76.9
Nuclear	21	40.4	12	23.1
Obstetrics score				
Primigravida	19	37	19	37
Multigravida	81	63	81	63
Trimesters				
First	17	32.7	12	23.1
Second	23	44.2	18	34.6
Third	12	23.1	22	42.3
History of hyperemesis				
Yes	7	13.5	8	15.4
No	45	86.5	44	84.6
IFB tablet				
Yes	35	67.3	43	82.7
No	17	32.7	9	17.3
Tetanus toxoid				
Yes	37	78.8	41	78.8
No	15	21.2	11	21.2
Total	52	100	52	100

IFB, iron and folic acid tablet

Among the urban respondents, the mean age group of participants is 24.06 ± 4.840. The mean age at marriage was 19.73 ± 3.249, and the mean duration of marriage was 4.567 ± 3.7613. A majority of them were homemakers (77%) followed by small-scale business (14%) and daily laborer (8%). In the present study, 2% of them were illiterate, and a majority of them live in joint family (77%); 37% of them were primigravida and 63% were having more than one child. Overall, 42% of them were in the third trimester, 35% of them were in the second trimester, and 23% of them were in the first trimester. A history of hyperemesis presents only in 15% of the participants. None of them used any family planning methods; 83% of them took iron and folic acid tablet and 79% of them have received TT injection; 89% of them were having sleep difficulty with a score of >3 according to PSQI [Table 1].

Table 2: Sleep score, nutritional score, and mid-upper arm circumference of antenatal mothers

S. no.	Rural		Urban	
	No	%	No	%
Sleep score				
<0	6	11.5	2	3.8
1-2	7	13.5	4	7.7
>3	39	75.0	46	88.5
Nutritional score				
<3	17	32.7	7	13.5
4-5	16	30.8	17	32.7
>6	19	36.5	28	53.8
Mid-upper arm circumference				
<22	35	67.3	28	53.8
23-30	16	30.8	21	40.4
>30	1	1.9	3	5.8

Of them, 54% were consuming more than six food groups in their daily diet, followed by 4-5 food group (33%) and <3 food group (14%). We found that among the participants, 54% of them were under nutrition, showing <22 cm by MUAC measurement [Table 2].

The present study highlighted that among urban respondents, there was no significant association observed between nutritional scores with relation to different trimester of pregnancy among the antenatal mothers, also with related to obstetrics score, age, occupation, the type of family, and literacy status in the urban area, but for the rural area, we observed a statistical significant association with related to occupation, the type of family, and literacy status [Table 3].

Similarly for sleep score, we found no significant association with different trimester of pregnancy, obstetric score, age, occupation, the type of family, and literacy status between urban and rural areas [Table 3].

In the present study, we found mild correlation and statistical significant between MUAC and BMI among urban respondents, and among rural respondents, we observed a mild negative correlation and nonsignificance [Tables 4 and 5].

DISCUSSION

As available literature shows the quality of sleep and nutritional requirements are very important aspect for antenatal mothers, the present study highlights more than 50% of them were consuming six food groups in their diet and 85% of the women involved in the study were having a bad sleep quality.

In our study, we found a nutritional score of urban resident was more compared with rural resident antenatal mothers; in another study observed by Sharma *et al.* women living in nuclear families, urban slums, and those

Table 3: Association of nutrition score and sleep score related to sociodemographic profiles

Association between	Urban		Rural	
	Chi-square test	P value	Chi-square test	P value
Nutrition score and trimester	0.745	0.946	3.547	0.471
Nutrition score and obstetrics score	6.743	0.874	13.191	0.659
Nutrition score and age	1.535	0.820	1.917	0.751
Nutrition score and occupation	4.003	0.676	15.070	0.048*
Nutrition score and type of family	0.933	0.624	10.838	0.028*
Nutrition score and literacy status	7.162	0.627	11.668	0.040*
Sleep score and trimester	5.841	0.211	1.538	0.820
Sleep score and obstetrics score	10.623	0.562	13.747	0.618
Sleep score and age	5.436	0.245	2.931	0.569
Sleep score and occupation	3.650	0.724	6.404	0.602
Sleep score and type of family	2.035	0.362	2.823	0.588
Sleep score and literacy status	0.885	0.927	7.747	0.257

Table 4: Correlation between different variables in urban area

Correlation between	Correlation coefficient (r)	Significant value	Remark
Nutrition and sleep score	0.202	P = 0.152	Mild correlation and statistically insignificant
Nutrition and BMI	0.045	P = 0.749	No correlation and statistically insignificant
Nutrition and MUAC	-0.045	P = 0.749	Mild correlation and statistically insignificant
MUAC and BMI	0.1376	P = 0.006*	Mild correlation and statistically significant

Table 5: Correlation between different variables in rural area

Correlation between	Correlation coefficient (r)	Significant value	Remark
Nutrition and sleep score	0.171	P = 0.226	Mild correlation and statistically insignificant
Nutrition and BMI	0.166	P = 0.241	Mild correlation and statistically insignificant
Nutrition and MUAC	0.185	P = 0.189	Mild correlation and statistically insignificant
MUAC and BMI	-0.116	P = 0.412	Mild negative correlation and statistically insignificant

* indicates significant

from backward classes had lower intakes of almost all the nutrients compared to their counterparts,^[12] which is lower than our study.

We found rural antenatal mothers consumed a less food group compared with urban antenatal mothers; likewise Nguyen *et al.* said in his study that an imbalance in dietary intakes was observed between residential areas and social group; women living in rural areas or belonging to backward castes had lower intakes compared with their counterparts.^[13,14]

This change in consuming different food group might be due to their sociodemographic variables and food taboos related to antenatal care.

54% of them were consuming more than six food groups in their daily diet, followed by 4–5 food group (33%) and <3 food group (14%). Shamim *et al.* in his study reconnoitered the food groups eaten by more than 50% of pregnant women having low (<3 food groups), medium (four food groups), and high (≥5 food groups) dietary diversity.^[15]

We found none of the houses were consumed more than 7–9 food groups in their daily diet both in urban and rural areas. Related findings were observed in his study^[7]; this shows that overall limited diversity of diets is in residential areas.

It was surprising to know that none of the study participants were consumed the nutrition services provided by Government of Karnataka. No significant association was found between sleep score and different trimester of pregnancy, obstetric score, age, occupation, type of family, and literacy status between urban and rural areas.

Comparable finding were reported by Joseph *et al.* and highlighted no association was found between sleep quality and selected sociodemographic and obstetric variables.^[16]

Other studies also opined that there was no statistical difference between education level, level of income, number of pregnancies and births, occupational status, and pregnancy trimester according to sleep quality.^[17,18] This shows that sleep quality is not associated with sociodemographic profile, but it positively affects the

nutritional status of antenatal mothers, which in turn affect the outcome of newborns.

CONCLUSION AND RECOMMENDATIONS

Our study highlights that an imbalance among antenatal mothers between resident areas related to nutrition score was due to literacy status, occupation, and the type of family of the antenatal mothers. Therefore, we endorse providing counseling facilities related to nutrition education to improve their dietary diversity by increasing the daily consumption of all food groups in their daily diet. The study also highlights a poor quality of sleep among antenatal mothers; we advise all antenatal mothers to have a good quality of sleep, at least 6–7h of sleep at night and 2h of rest in the afternoon, so that there will be a less chance of low-birth-weight babies, IUGR, etc.

We recommend the Ministry of Women and Child Development to improve the quality of nutrition under Poshan Abhyian and strengthen the nutritional service.

Limitations of the study

A 24-h recall dietary intake was collected. The study was focused only on dietary diversity, a single dimension of diet quality, not taken food quantities. We have not studied the outcomes of newborn in the present study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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