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Research Article

### ASSESSING SLEEP QUALITY AND FACTORS AMONG PREGNANT WOMEN VISITING ANTENATAL CARE; IN ARMED FORCES HOSPITAL – DHAHRAN, SAUDI ARABIA HOW PREGNANTS SLEEP!

Aishah Mohammed Alenezi <sup>1</sup> and Amal Mohammed AlShehab <sup>2</sup>

<sup>1</sup>R4 Family Medicine Resident in Armed Forces Hospital – Dhahran, Eastern province.

<sup>2</sup>Family Medicine Consultant in Armed Forces Hospital, Director of Family Medicine Saudi Residency Program, Assistant Director of Academic Affairs & Training Administration – Dhahran

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**Abstract:**

**Background:** Sleep is one of the daily important needs for physical, psychological and mental health for all individuals. During pregnancy, sleep disturbance is commonly happened, even with women with normal sleep previously.

**Aim:** To assess quality of sleep-in pregnant women and associated factors.

**Methods:** This study was a cross-sectional including 148 participants, conducted in Dhahran city by distributing a validated self-constricted questionnaire among pregnant women attending Antenatal Clinic in Armed forces hospital during 2021.

**Results:** One hundred forty-eight pregnant women participated in this study. most of (the cases 62 (80.5%) stated fairly good sleeping quality and 137 (97.9%) never use sleeping pills, where the mean scores of “Minutes needed to fall asleep each night” and “Hours of sleep/night” were 21.9±18.3 and 8.2±1.9. The mean of the global score was 4.5±2.4 indicating good sleep quality. No significant difference was found regarding demographic data except using of hypnotic medication before pregnancy, where those who receive had higher score than those who didn't receive (9.0 vs 4.4, p=0.027).

**Conclusions:** Most of the cases stated fairly good sleeping quality, where, the mean of the global score indicated good sleep quality. Using hypnotic medication before pregnancy showed higher score than those who didn't use indicating problem in sleeping. Further nation-wide studies on the assessment of sleep quality and prevalence among pregnant women and associated factors need to be conducted in larger sample size and regions other than Dhahran.

**Keyword:** Sleep quality and prevalence, Pregnant Women, Knowledge, Antenatal care, Pittsburgh Sleep Quality Index questionnaire.

**Corresponding author:****Dr. Aishah Mohammed Alenezi,**

Family Medicine Resident, Dhahran

Mobile: 00966583103820

E-mail: a.m.093@hotmail.com

QR code



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## INTRODUCTION:

### Background:

Pregnancy is the stage of fetus formation and development in the mother uterus for nine months, it is a unique time for mothers' life, However, there are some different risks that may be experienced by the mother or fetus during this period

Sleep is one of the daily important needs for physical, psychological and mental health for all individuals as well in pregnant women (1)

During pregnancy, sleep disturbance is commonly happen (2-4) even with women with normal sleep previously (5,6), and usually it is one of the things that disregarded or overlooked during health care assessment for pregnant women (7)

Different changes happen during pregnancy comprise hormonal, physiological and physical changes that can cause negative effect on the mother and her fetus (8)

Many studies showed that decrease sleep quality can influence to unfavorable consequences on pregnancy, it increase the risk of delivering preterm (9), moreover it can affect the type of delivery, length of labor stages, as well as neonates' Apgar score and birth weight negatively (10), additionally they link poor sleep quality and depressive symptoms in pregnancy (11), and it increase risk of abnormal glucose regulation thus GDM (12,13)

Understand this is important for mother and fetus to give timely assessment and management, whereas some causes of sleep disturbance can be treated. Many studies have assessed the sleep quality during pregnancy but most of these studies were carried out in the western population only, and no exact statistics found on the prevalence of sleep quality in Saudi Arabia. This study aimed to assess quality of sleep in pregnant women and associated factors.

## METHODOLOGY:

### Study design:

This study was a descriptive cross-sectional study conducted among pregnant women who attending the antenatal care clinic (saqr assalam) in Dhahran city, eastern province, Saudi Arabia, who fit the inclusion criteria (age >16 years, / any trimester, who have no chronic disease).

Convenient nonprobability sampling method was used until the sample size (148 pregnant women) was reached. A sample of were chosen randomly from all of the programs using a proportional percentage.

All ethical approvals were obtained (IRB Dhahran, the primary care center, written consent from participants on the front page of the Questionnaire). All information is confidential.

### Data collection tool (instrument):

The data was collected through self-administered distributed questionnaire copies in female waiting area. The authors used Pittsburgh Sleep Quality Index questionnaire (PSQI) which was developed by Buysse et al in 1989 to evaluate sleep quality. It consists of 19 self-report items of which questions are open-ended belong to one of seven subcategories and 14 are ranked on a Likert scale from 0 to 3. 5 additional questions rated by the respondent's roommate or bed partner are included for clinical purposes & are not scored. Questionnaire should require between 5 – 10 min for completion. Higher scores indicate poor sleep quality. A total score higher than 5 is assessed as poor sleep quality. This cutoff point has a sensitivity of 89.6% & a specificity of 86.5% (14)

The PSQI has been successfully translated into Arabic & back translated into English by 10 Arabic bilingual translators. then was tested in a sample of 35 healthy Arabic bilinguals. The internal consistency reliability for the global PSQI demonstrate borderline acceptability (Cronbach's alpha = .65), They adapted this pre designed questionnaire Arabic version done by (15) consent was taken on 8 oct 2019. (<https://cutt.us/Appendix1>)

### Data entry and analysis:

All collected data were coded and entered into a personal computer. Data entry and statistical analysis performed by using the Statistical Product and Service Solutions (SPSS, version 22.0) and appropriate statistical tests were applied. Descriptive statistics (i.e., frequency, percentage, mean and standard deviation) calculated. Independent t test, one way ANOVA, and Pearson correlation were applied to compare participants' quality of sleep according to different independent variables (socio-demographic characteristics) were conducted. P-value of <0.05 was considered as statistically significant.

## RESULT:

Out of 148 pregnant women, 84 (56.8%) were from group age (26-35), 91 (61.5%) were in 2<sup>nd</sup> semester, 48 (32.4%) in 1<sup>st</sup> semester and only 7 (4.7%) in 3<sup>rd</sup> semester. More than third 49 (37.7%) were overweight and third 41 (31.5%) were obese, where the mean score of BMI was 28.0±5.6. The half 50.7%

had attend college and 37.8% attend high school, 123 (84.8%) were housewives. Most of the cases 125 (84.5%) didn't have complications. The majority 141 (95.3%) live in the city, 134 (90.5%) have family support, and 145 (98.0%) didn't receive Hypnotic medication before pregnancy. **(Table 1)**

Sleep quality characteristics present in table 2, where most of (the cases 62 (80.5%) stated fairly good sleeping quality and 137 (97.9%) never use sleeping pills, where the mean scores of "Minutes needed to fall asleep each night" and "Hours of sleep/night" were  $21.9 \pm 18.3$  and  $8.2 \pm 1.9$ . **(Table 2)**

The result in table 3 revealed that most of the cases 132 (89.2%) have their partners in the same bed, 89 (64.5%) no snoring, and 106 (80.3%) no sleep apnea. **(Table 3)**

The result in table 4 showed the mean score of the total and the seven subgroups, where the mean of the global score was  $4.5 \pm 2.4$  indicating good sleep quality. **(Table 4)**

The result showed a non- significant negative correlation between global score and "No of current pregnancy", "No of current children", and "BMI". While a non- significant positive correlation was found between global score and "Last baby age". **(Table 5)**

The result revealed a significant difference in the global score regarding using hypnotic medication before pregnancy, where those who receive had higher score than those who didn't receive (9.0 vs 4.4,  $p=0.027$ ) indicating having problem in sleeping. On the other hand, no significant difference was found regarding other demographic data. **(Table 6)**

**Table (1) Demographic data:**

Variable	N	%
<b>Age</b>		
Unknown	2	1.4
18-25	35	23.6
26-35	84	56.8
26-36	1	.7
26-45	1	.7
36-45	25	16.9
<b>Semester</b>		
Unknown	2	1.4
1st trimester	48	32.4
2nd trimester	91	61.5
3rd trimester	7	4.7
<b>BMI category</b>		
underweight	4	3.1
Normal weight	36	27.7
Overweight	49	37.7
Obese	41	31.5
<b>Education</b>		
Unknown	1	.7
post college	2	1.4
College	73	49.3
High school	56	37.8
Intermediate	9	6.1
Primary school	7	4.7
<b>Occupation</b>		
Unknown	2	1.4
housewife	124	83.8
work	22	14.9
<b>Monthly income</b>		
Unknown	84	56.8

<6000	30	20.3
>15000	4	2.7
6000-15000	30	20.3
<b>Complications</b>		
abortion	1	.7
C/S	17	11.5
GDM	2	1.4
GDM - proteinuria	1	.7
high BP	1	.7
palpitation	1	.7
none	125	84.5
<b>Hypnotic medication before pregnancy</b>		
no	145	98.0
sometimes	1	.7
yes	2	1.4
<b>Residency</b>		
Unknown	1	.7
city	141	95.3
town	6	4.1
<b>Family support</b>		
Unknown	2	1.4
not present	12	8.1
present	134	90.5
<b>Variable</b>		
	<b>Mean ± SD</b>	<b>Rang (min-max)</b>
%)MI	28.0±5.6	(16.2-4.9)
<b>Variable</b>		
	<b>Median</b>	<b>Quartile (25,75 )</b>
No of current pregnancy	2	(1,4)
No of current children	1	(0,2)
Las baby age	3	(2,5)

Data were presented as number (%) or as Mean ± SD or as median

Table (2) Pittsburgh Sleep Quality Index questionnaire (PSQI) items (self-reported)

Variable	N	%
<b>Can't sleep within 30 min</b>		
Never	56	41.2
Less than 1/week	22	16.2
One -tow/week	36	26.5
Three or more/week	22	16.2
<b>Wake up middle of night or early morning</b>		
Never	28	21.1
Less than 1/week	12	9.0
One -tow/week	35	26.3
Three or more/week	58	43.6
<b>Wake up for bathroom</b>		
Never	16	11.4
Less than 1/week	11	7.9
One -tow/week	23	16.4
Three or more/week	90	64.3
<b>Breathing difficulty</b>		
Never	65	54.2
Less than 1/week	24	20.0
One -tow/week	13	10.8
Three or more/week	18	15.0
<b>Coughing or snoring</b>		
Never	94	78.3
Less than 1/week	17	14.2
One -tow/week	3	2.5
Three or more/week	6	5.0
<b>Feeling cold</b>		
Never	58	46.8
Less than 1/week	39	31.5
One -tow/week	21	16.9
Three or more/week	6	4.8
<b>Feeling hot</b>		
Never	68	56.7
Less than 1/week	23	19.2
One -tow/week	16	13.3
Three or more/week	13	10.8
<b>Bad dreams</b>		
Never	70	57.9
Less than 1/week	29	24.0
One -tow/week	13	10.7
Three or more/week	9	7.4
<b>Feeling pain</b>		
Never	49	40.8
Less than 1/week	30	25.0
One -tow/week	28	23.3
Three or more/week	13	10.8
<b>Other reasons</b>		
Abdomen pain	1	.7
Backache	2	1.4
Bloating	1	.7

Cough	1	.7		
Flu	1	.7		
Leg cramp	1	.7		
Nausea	3	2.0		
Pain	2	1.4		
Toothache	1	.7		
<b>Sleep quality overall</b>				
very good	2	2.6		
fairly good	62	80.5		
fairly bad	11	14.3		
very bad	2	2.6		
<b>Using sleeping pills</b>				
Never	137	97.9		
Less than 1/week	2	1.4		
Three or more/week	1	.7		
<b>Daytime dysfunction</b>				
Never	93	69.4		
Less than 1/week	20	14.9		
One -tow/week	19	14.2		
Three or more/week	2	1.5		
<b>How big is the problem to keep enough to get things done</b>				
No problem at all	72	50.0		
Only a very slight problem	46	31.9		
Somewhat of a problem	22	15.3		
Very big problem	4	2.8		
<b>Variable</b>	<b>Mean ± SD</b>	<b>Rang (min-max)</b>	<b>Median</b>	<b>Quartile (25,75 )</b>
<b>Minutes needed to fall asleep each night</b>	21.9±18.3	(1-120)	15	(10,30)
<b>Hours of sleep/night</b>	8.2±1.9	(5-12)	8	(7,10)

Data were presented as number (%) or as Mean ± SD or as median

**Table (3) Pittsburgh Sleep Quality Index questionnaire (PSQI) items (respondent's roommate or bed partner)**

Variable	N	%
<b>Room partner</b>		
No bed partner or roommate	3	2.0
Partner in other room	7	4.8
Partner in room not in bed	3	2.0
Present in same bed	132	89.2
Unknown	3	2.0
<b>Snoring</b>		
Never	89	64.5
Less than 1/week	22	15.9
One -tow/week	16	11.6
Three or more/week	11	8.0
<b>Sleep apnea</b>		
Never	106	80.3
Less than 1/week	17	12.9
One -tow/week	5	3.8
Three or more/week	4	3.0
<b>Leg twitch/jerk</b>		
Never	92	70.8
Less than 1/week	16	12.3
One -tow/week	9	6.9
Three or more/week	13	10.0
<b>Confusing episode</b>		
Never	98	73.1
Less than 1/week	21	15.7
One -tow/week	10	7.5
Three or more/week	5	3.7

Data were presented as number (%)

**Table (4) Pittsburgh Sleep Quality Index questionnaire (PSQI) subcategories and global score:**

Variable	Mean ± SD	Rang (min-max)	Median	Quartile (25,75 )
<b>Global score</b>	4.5±2.4	(0-13)	4	(3,6)
<b>Subjective sleep quality</b>	1.2±0.5	(0-3)	1	(0,1)
<b>Sleep latency</b>	1.1±0.9	(0-3)	1	(0,2)
<b>Sleep duration</b>	0.9±0.5	(0-3)	1	(0,0.75)
<b>Habitual sleep efficiency</b>	0.9±0.5	(0-3)	1	(0,0.75)
<b>Step disturbance</b>	1.4±0.7	(0-3)	1	(0,2)
<b>Using sleeping medication</b>	0.2±0.03	(0-3)	1	(0,1)
<b>Daytime dysfunction</b>	0.8±0.6	(0-3)	1	(0,1)

Data were presented as Mean ± SD or as median

**Table (5) The correlation between the global score and demographic data:**

Variable		No of current pregnancy	BMI	No of current children	Last baby age
Global score	r	-0.093	-0.075	-0.047	0.111
	P value	0.265	0.397	0.678	0.256

r: Pearson correlation

P value &lt; 0.05 consider significant

**Table (6) The differences in the global score regarding demographic data:**

Variable	Mean	SD	Test	P value
<b>Age</b>				
18-25	4.4857	1.90002	F=0.872	0.502
26-35	4.3571	2.71383		
36-45	5.2400	1.89912		
<b>Semester</b>				
1st trimester	4.8750	2.58165	F=0.612	0.608
2nd trimester	4.3407	2.36746		
3rd trimester	5.0000	2.30940		
<b>BMI category</b>				
1.00	6.0000	1.63299	F=0.431	0.731
2.00	4.5833	2.47704		
3.00	4.8367	2.44393		
4.00	4.8537	2.41414		
<b>Education</b>				
post college	6.0000	4.24264	F=1.308	0.264
College	4.8630	2.34115		
High school	4.1964	2.56139		
Intermediate	4.8889	2.20479		
Primary school	3.5714	2.14920		
<b>Occupation</b>				
housewife	4.6290	2.47415	T=1.855	.0.066
work	3.9545	2.33966		
<b>Monthly income</b>				
<6000	3.8333	2.05247	F=1.540	0.207
>15000	5.7500	1.89297		
6000-15000	4.3667	1.99107		
<b>Hypnotic medication before pregnancy</b>				
no	4.4897	2.36325	F=3.687	0.027*
sometimes	3.0000			
yes	9.0000	5.65685		
<b>Residency</b>				
city	4.4539	2.45670	T=1.188	.0.237
town	6.3333	1.50555		
<b>Family support</b>				
not present	4.0000	2.29624	T=0.794	0.429
present	4.5896	2.47761		

Comparison was done using independent t test (T) or one way ANOVA (F)

P value &lt; 0.05 consider significant

**DISCUSSION:**

Sleep disturbances are common during pregnancy and numerous researchers have focused on exploring the factors have influencing on the sleep, where, poor sleep quality has adverse pregnancy outcomes both in the mother and the fetus. (4,16) In 2002, Hedman and colleagues, conducted a survey and found that the mean hours of total sleep per 24 hours before pregnancy was 7.8 hours and increased to 8.2 hours during the first trimester. While, there was a reducing in the sleep time during the second trimester to 8.0 hours and it again decreased to 7.8 hours in third semester. (17)

The factors contributing to the changes 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, and socioeconomic factors. (18) Also, the levels of oxytocin, prolactin, and cortisol increase and have effects on sleep regulation. Furthermore, respiratory, musculoskeletal, and cardiovascular changes, as well as weight gain and bladder compression by the uterus have impacts on sleep. (19) This disturbance in sleep pattern varies from 13% to 80% in the first trimester and 66% to 97% in the third trimester. (20)

The present study aimed to assess quality of sleep in pregnant women and associated factors.

Most of the participants reported fairly good sleeping quality, where the global score was 4.5. This result is better than Vietnam study, where, 58.% reported good quality of sleep (PSQI<5). (21) Also, it is better than Taiwan and Iran studies (the mean score PSQI was  $7.25 \pm 3.43$  and  $8.58 \pm 2.55$ , respectively). (2,22)

In the current study, younger mothers were more likely to have better quality of sleep. This tendency was similar to a study conducted by Taskiran, showing that women aged between 29- and 45-year-old had worse sleep quality than the age group between 17 and 28. (23) Also, the study conducted in Vietnam. (21) However, as the sample size of our study was quite small, this difference might not reveal as significant.

The results of the current study show that a pregnant woman in the third trimester has a poor quality of sleep (the mean global score =5) without significant difference. Though the sleep quality was not altered in the initial months of pregnancy. India, Canada, and Australia studies reported similar result. (4,24,25) Where, in Canada study, the average PSQI score

during pregnancy was 6.07 and 45.7% of expectant mothers experienced poor sleep quality as defined by a PSQI  $\geq 5$  score. (24) Also, in India study 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. (4,24)

In USA study, parity was a significant correlate of sleep. Nulliparous women exhibited a significant decline in sleep quality in later pregnancy as compared to earlier pregnancy, as indicated by higher scores on the PQSI. In contrast, multiparous women exhibited poorer overall sleep quality than nulliparous women during the first and second trimester of pregnancy and no significant change over the course of pregnancy. However, changes were observed in reports of trouble sleeping, with both multiparous and nulliparous women reporting a frequent need to get up to use the restroom at night during pregnancy. (3) Similar result was reported in the current study, where a non-significant negative correlation was reported between parity and global score. The data from the current study and USA study support the argument that multiparous women may have more difficulty sleeping due to external demands related to child-rearing.

In the current study, the result showed that only 3 used medications before pregnancy, where those who use it have significantly higher global score indicating problems in sleeping ( $p < 0.027$ ). While in USA study, the authors reported the high prevalence of sleep related medication use by women during pregnancy. Approximately one in 25 women reported medication use at least three times a week, and more than one in 10 reported use in the past month. (26) This differences in the percentage could be due to several factors such as socio-economic factors, geographic areas, sample size, and studies nature.

Overall, better understanding of the quality of sleep and sleep disorders can decrease the incidence of adverse maternal and fetal outcomes among pregnant women. In Thailand study it was found that appropriate sleep counselling to pregnant women by health care professionals may improve the quality of prenatal care. (2) However, in the current study, this topic was not included due to time limitations.

**Limitations:**

The hospital in the study area only accept who are eligible to ministry of defense (military or non-military) and their relatives, so our sample can't

represent society. This antenatal care clinic in primary health care center (saqr assalam) accept follow up of pregnant women until 6<sup>th</sup> month of pregnancy then the pregnant continue follow up in obstetrics & gynecology clinic until delivery. The nature of the study was subjective. All of these limitations prevent the researcher from generalize the results to the community.

#### CONCLUSION AND RECOMMENDATION:

The study sidelight on the sleeping quality pattern among pregnant women, where most of the cases stated fairly good sleeping quality, and the mean of the global score indicated good sleep quality. Using hypnotic medication before pregnancy showed higher score than those who didn't use indicating problem in sleeping. The sleep quality is disturbed during pregnancy and it is more in the third trimester of pregnancy, even that there is no significant difference. The authors recommended that doctors should encourage the pregnant women to talk about sleep disturbance with their doctors. Further nationwide studies on the assessment of sleep quality and prevalence among pregnant women and associated factors need to be conducted in larger sample size and regions other than Dhahran.

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