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Quality of Sleep among Pregnant Women

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Abstract

Objectives: The study aimed to describe the quality of sleep and explore factors especially Sleep Hygiene Practices associated with sleep quality among pregnant women. Study design: This is a cross-sectional study. Methods: 119 healthy pregnant women in two central hospitals in Vietnam were participated in this study. The Pittsburgh Sleep Quality Index (PSQI) was employed to evaluate sleep quality and the Modified Sleep Hygiene Practices was used to describe sleeping practices among pregnant women. Results: The results showed that while 58.8% pregnant women had quite good sleep quality, 41.2% of pregnant women had mild to moderate quality sleep disturbance. The quality of sleep was better in second trimester, but then getting worst in the third trimester. Multipara experienced worse sleep quality than nullipara. Poor sleep quality had a positive correlation with unhealthy Sleep Hygiene Practices including using an uncomfortable bed ($p < 0.05$), going to bed with variable bedtime ($p < 0.01$), watching TV or making call in bed other than sleep ($p < 0.05$), going to sleep without sleep sensation ($p < 0.001$) and staying in bed even though it was difficult to fall asleep ($p < 0.001$). Conclusion: Pregnant women should be taken care of on sleep quality, especially in the first and third trimester as they experience more change in hormone and physiology. Sleep Hygiene Practices should be emphasized in health education for pregnant women.

Keywords

Quality of Sleep, Pregnant Women

1. Introduction

Pregnant women experienced hormonal and physiological change that might be reasons for sleep disturbance. In 2007, National Sleep Foundation [1] reported that about 79% of pregnant women in the America suffered from sleep distur-

bance. It was reported that sleep alternation started with the first trimester and reached its maximum level by the third trimester. Facco *et al.* [2] found that poor sleep quality rose from 26% in the first trimester to 40% in the third trimester. Poor sleep quality could lead to some serious complications for both mothers and their babies. Pregnant women might suffer from stress, depression [3] and gestational diabetes [2] [4] [5]. The labor time could last longer; cesarean section delivery [6] [7] and preterm birth delivery [8] might occur. It was suggested that several factors could influence sleep quality of maternal health. These were maternal age [9] [10], pre-pregnancy body mass index (BMI) [10] [11], gestational age [12] [13], gravida (the number of pregnancy) [14] and para (the number of pregnancy beyond 20 weeks of gestation) [15]. In particular, Sleep Hygiene Practices have linked good effects on sleep quality according to some research studies [16] [17] [18]. In Vietnam, no research on quality of sleep among pregnant women was found. Therefore, the aim of this study was to describe sleep quality of pregnant women and explore factors especially Sleep Hygiene Practices associated with sleep quality.

2. Methods

This was a cross-sectional study. A convenient sample was chosen. 119 healthy pregnant women at obstetric clinic department in two central hospitals of Vietnam, from January to May 2018, were invited to participate in this study. The researchers met pregnant women at the obstetric clinic room, explained the research purpose and invited pregnant women to participate in the study. After signing the consent form, pregnant women were given their own time to complete the questionnaire. Each questionnaire required about 15 to 20 minutes to be finished. The study excluded the women who refused to answer the questionnaire.

The Vietnamese version of PSQI, translated and validated by the National Psychiatric Hospital of Vietnam [19], was used in this study. The PSQI has 18 self-report questions which included seven components: 1) Subjective sleep quality, 2) Sleep latency, 3) Sleep duration, 4) Habitual sleep efficiency, 5) Sleep disorder, 6) Sleeping medication use, and 7) Daytime dysfunction. Each component is scored from 0 to 3, thus, the total global score is 0 to 21, where higher scores indicating poorer quality of sleep. The PSQI was interpreted into 4 levels of sleep quality 1) good sleep quality (PSQI $\leq$ 5), 2) mild sleep quality disturbance (PSQI: 6 - 10), moderate sleep quality disturbance (PSQI: 11 - 15) and severe sleep quality disturbance (PSQI $\geq$ 16).

To explore the factors associated to sleep quality, Modified Sleep Hygiene Practices was used. This is a modified version from many original versions to measure sleep hygiene [18] [20] [21] [22]. Back translation procedure was employed to translate the Modified Sleep Hygiene Practices from English to Vietnamese. The scale consists self-rate 18 items including sleep habits, sleep environment, and eating or drinking habits prior to sleep. Participants are required

to indicate how frequently (always, frequently, sometimes, rarely, or never) they engage in specific behaviors. Each item is then coded with scores ranging from 5 (always) to 1 (never). A global score for sleep hygiene ranges from 18 to 90. Higher scores indicate worse sleep hygiene practices.

SPSS version 21 was used for data analysis. Descriptive analysis was used to present the characteristics of the participants. As the outcome variable (sleep quality) was not a normal distribution, non-parametric tests (Mann-Whitney U Test, Kruskal-Wallis Test, Spearman's rho correlation) were employed. All tests were two-tailed and $p < 0.05$ was considered significant.

The study was approved by the Hanoi Medical University, No. 4116.

3. Results

All of 119 pregnant women completed the questionnaire. Table 1 displays demographic and obstetric characteristics of participants. The mean of age was 27.82. 63.9% of them were employed. Most of women (75.6%) completed university educational level or higher. More than half of the women were with normal pre-pregnant BMI (58%). At the time of the survey, 57.1% of pregnant women were in their third trimester. 58.8% of pregnant women never had pregnant beyond 20 weeks of gestation (nullipara), which included 56.3% of pregnant women reported that this was the first time they have a pregnancy (primigravida). There were 12 cases reported of abortion/miscarriage in obstetric history.

The mean PSQI score was 5.38 ± 2.73, ranged from 1 to 15. More than half (58.8%) of pregnant women reported that they had good sleep quality. There were 37% of pregnant women had mild sleep quality disturbance and only 4.2% of the women experienced poor quality of sleep (Table 2). About three-fourths of participants slept more than 7 hours per night (75.6%) and had very high sleep efficiency (70.6%). There were 14.3% of pregnant women who needed more than 60 minutes to fall asleep. While 40.3% of the women reported that they experienced sleep disturbance from once to twice a week, no woman complained about this trouble for more than two times per week. Majority of the women experienced that they had no or less than once a week daytime dysfunction related to sleep at night (Table 3).

Bivariate analysis was used to examine the relationship between factors including age, pre-pregnancy BMI, occupation, education level, gestational age, gravida, para, and overall sleep hygiene practices (Table 4). The sleep quality was getting worse since the beginning of the first trimester compare to before pregnancy, then became better in the second trimester and got worse again in the third trimester, mean rank were 59.36, 44.44 and 66.18, respectively (Kruskal-Wallis Test, $p = 0.02$). We also found a significant difference in the quality of sleep among parity groups. The multipara group (pregnant women had two or more than two times of pregnancy beyond 20 week) had worse sleep quality than the nullipara group (pregnant women had never reached a pregnancy

Table 1. Demographic characteristics of pregnant women.

Variables	Number (N = 119)	Percentage (%)
Maternal age	Mean ± SD: 27.82 ± 3.97; Range: 19 - 40	
Pre-pregnancy BMI		
Underweight	33	27.7
Normal weight	69	58
Overweight/obese	17	14.3
	Mean ± SD: 20.07 ± 2.4; Range 13.89 - 30.47	
Occupational status		
Employment (officer, educator)	76	63.9
Self-employment (housewife, businessman)	28	23.5
Others	15	12.6
Education level		
Under university level	29	24.4
University level and higher	90	75.6
Marriage status		
Married	119	10
Single/divorced/widowed	0	0
Gestational age		
1st trimester (weeks 0 - 13)	25	21
2nd trimester (weeks 14 - 28)	26	21.8
3rd trimester (weeks ≥ 29)	68	57.1
		Mean ± SD: 27.34 ± 10.37
Gravida		
Primi-gravida[1]	67	56.3
Multi-gravida[2]	52	43.7
Parity		
Nullipara[3]	70	58.8
Primipara[4]	43	36.1
Multipara[5]	6	5
Abnormal obstetric history		
Abortion	12	10.1
Preterm delivery	5	4.2
Cesarean delivery	9	7.6

[1]First time of pregnancy; [2]Second or more than two times of pregnancy; [3]Never completed one pregnancy beyond 20 weeks; [4]Have completed one pregnancy beyond 20 weeks; [5]Have more than two pregnancy beyond 20 weeks.

beyond 20 weeks), mean rank were 92.42 and 56.32, respectively (Kruskal-Wallis Test, p = 0.04).

Table 2. Sleep quality among pregnant women.

Variables	N = 119	Percentage
Good (PSQI ≤ 5)	70	58.8
Mild sleep quality disturbance	44	37
Moderate sleep quality disturbance	5	4.2
Total PSQI: Mean ± SD: 5.38 ± 2.73, Range: 1 - 15		

Table 3. Frequency of the classification of sleep components.

Variables	Number (N = 119)	Percentage
Subjective sleep quality (pregnant women reported)		
Very good	9	7.6
Quite good	88	73.9
Quite bad	21	17.6
Very bad	1	0.8
Sleep latency—the time fall asleep (minutes)		
≤15	32	26.9
>15 and ≤30	41	35.4
>30 and ≤60	29	24.4
>60	17	14.3
	Mean ± SD: 25.25 ± 20.51	
Sleep duration (hours per night)		
≥7	90	75.6
<7 and ≥6	20	16.8
<6 and ≥5	7	5.9
<5	2	1.7
	Mean ± SD: 6.99 ± 0.93	
Habitual sleep efficiency (the time asleep over the total time in bed)		
Very high (≥85%)	84	70.6
Quite high (75% - 84%)	21	17.6
Quite low (65% - 74%)	12	10.1
Very low (≤64%)	2	1.7
	Mean ± SD: 89.84 ± 12.46	
Sleep disturbance (trouble sleep)		
No time a week	0	0
Less than once a week	71	59.7
Once or twice a week	48	40.3
Three or more times a week	0	1.7
Use of sleep medications		

Continued

Never	119	100
Daytime dysfunction		
No time a week	40	33.6
Less than once a week	60	50.4
Once or twice a week	18	15.1
Three or more times a week	1	0.8

Table 4. Bivariate analysis of factors that influence sleep quality.

Variables	Mean rank	Bi-variate analysis
Maternal age		$-0.07_{(Sp)}$
Pre-pregnancy BMI		
Underweight	64.94	
Normal weight	58.23	$0.96_{(Kr)}$
Overweight/obese	57.59	
Occupational status		
Employment	57.18	
Self-employment	60.41	$2.88_{(Kr)}$
Others	73.53	
Education level		
Under university level	50.44	$-1.1_{(M)}$
University level and higher	72	
Gestational age		
First trimester	59.36	
Second trimester	44.44	$7.64^{*}_{(Kr)}$
Third trimester	66.18	
Gravida groups		
Primigravida	56.49	$-1.28_{(M)}$
Multigavida	64.53	
Parity groups		
Nullipara	56.32	
Primipara	61.47	$6.3^{*}_{(Kr)}$
Multipara	92.42	
Overall sleep hygiene practices		$0.43^{***}_{(sp)}$

*$p < 0.05$; $_{(Sp)}$ Spearman's rho; $_{(Kr)}$ Kruskal-Wallis Test; $_{(M)}$ Mann-Whitney U Test.

Figure 1 showed the influence of unhealthy sleep hygiene practice to quality of sleep including using an uncomfortable bed ($p < 0.05$), going to bed with variable bedtime ($p < 0.01$), watching TV or making call in bed other than sleep (p

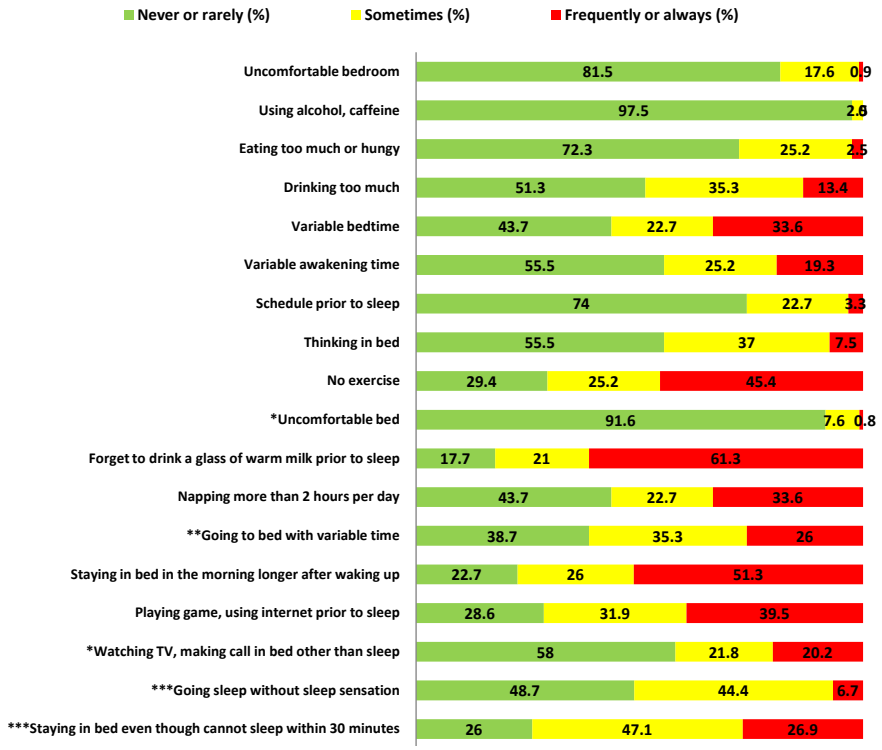

Figure 1. Sleep Hygiene Practices and its association with sleep quality.

< 0.05), going to sleep without sleep sensation ($p < 0.001$) and staying in bed even though it is difficult to fall asleep ($p < 0.001$). Spearman's rho correlation showed a positive moderate correlation between overall sleep hygiene practices and sleep quality ($r_s = 0.43$, $p < 0.001$).

4. Discussion

Our study found that generally pregnant women had good sleep quality, the mean PSQI was 5.38 ± 2.73. According to a study conducted in Taiwan [23] and in Iran [18], the quality of sleep among pregnant women (the mean score PSQI was 7.25 ± 3.43 and 8.58 ± 2.55, respectively) was slightly poorer than that of Vietnamese women in our study. This difference may be explained as only healthy pregnant women were included in our study.

In our study, younger mothers were more likely to have better quality of sleep ($r_s = -0.07$). This trend was similar to a study conducted by Taskiran [9], showing that women aged between 29 and 45 year old had worse sleep quality than the age group between 17 and 28. However, as the sample size of our study was quite small, this difference might not reveal as significant.

Our study found the statistically significant correlation between gestational age and sleep quality. Facco *et al.* [12] also found that pregnant women experienced worse sleep quality in the first trimester; it became better in the second trimester and then getting worse again in the third trimester. The reasons could be due to increasing hormones (estrogen and progesterone) started in the first trimester and reached the peak in the third trimester. Physiological change such

as tender breast, enlarge uterus also reached the largest in the third trimester [24].

Women who experienced pregnancy for the first time might have worse sleep quality likely because of concerns about baby care [14] [15]. In our study, the relationship between the number of pregnancies (gravida) and sleep quality was not found. However, we found a statistical significant difference between sleep quality and parity (the number of pregnancies reaching 20 weeks of gestation), which indicated that multipara had worse sleep quality than nullipara. We could not find any evidence in our limited literature to explain for the reason that the number of pregnancy beyond 20 weeks could affect the quality of sleep among pregnant women.

Sleep quality could be affected by poor Sleep Hygiene Practices, including uncomfortable bed, variable bedtime, using the bed for other activities, going to bed without sensation and staying in bed even though cannot sleep within 30 minutes. Our results showed positive correlations between sleep quality and Sleep Hygiene Practices that were consistent with literature [16] [17] [18].

5. Limitation

The study was conducted in a short time, with a convenient sample and a small sample size thus the finding may not be used for generalization. Some information requires participants to recall that could lead to recall bias.

6. Conclusion

Pregnant women should be taken care of on sleep quality, especially in the first and third trimester as they experience more change in hormone and physiology. Sleep Hygiene Practices should be emphasized in health education for pregnant women including: using a comfortable bed, not going to bed with variable bedtime, should not watch TV or make call at bed time, not going to sleep without sleep sensation, and should not stay in bed if it is difficult to fall asleep.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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