Caucasian Journal of Science

Journal home page: www.cjoscience.com
Vol.5 Issue:2 Year: 2018

Received: April 2018 **Accepted**: July 2018

THE RELATIONSHIP BETWEEN SLEEP QUALITY OF PREGNANT AND SLEEP DURATION OF NEWBORNS

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ABSTRACT

Sleep is one of the most important activities of daily living affecting the life quality and health of individuals. Sleep disturbances are prevalent during pregnancy as a result of physical, physiological, and hormonal changes. The objective of this study was to determine the relationship between sleep duration of newborns and sleep quality of pregnant women in third trimester of pregnancy.

This study was designed longitudinal and correlation study. 147 pregnant participated in the research. The pregnant women's sleep quality was assessed by using Pittsburgh Sleep Quality Index in the 7th, 8th, and 9th months. Sleep duration of newborns was follow-up for 28 days and their daytime and night sleep duration was recorded.

Pregnant women's sleep quality decreased as gestation period progressed. Sleep quality mean score of the pregnant were 4.24±2.78, 4.76 ±2.78 and 6.17±3.10 in the 7th, 8th, and 9th months, respectively ($p<0.01$). As sleep latency, sleep disturbances, and daytime dysfunction of the pregnant women increased, sleep duration of the newborns decreased

Key Words: pregnant, sleep quality, sleep duration, newborn.

INTRODUCTION

Sleep is one of the most important activities of daily living affecting life quality and health of individuals (Doğan et al., 2005; Taşkıran, 2011). In pregnancy, it is also important for healthy fetal-placental development as well as physical and mental well-being. In addition to physiological and psychological change occurring in pregnancy, sleep duration and quality also change (Taşkıran, 2011; Pien & Schwab, 2004; Skouteris et al., 2008; Ko et al., 2010). This change starts as from the first trimester and is observed more intensively especially in the

third trimester (Taşkıran, 2011; Pien & Schwab, 2004; Ko et al., 2012). Previous studies have reported that problems regarding sleep quality in pregnancy are between 64% and 86%. (Çoban &Yanıkkerem, 2010; Ko et al., 2012; Pien et al.,2005).

Sleep quality means that an individual feels herself/himself energetic, rested, and ready for a new day. Sleep quality of pregnant women might be negatively affected due to changes such as hormonal changes, nausea, back pain, frequent urination, growth of fetus, frequent breathing, leg cramps, restless leg syndrome, and snoring (Skouteris et al., 2009; Lopes et al., 2004). Sleep problems and decreased sleep quality experienced during pregnancy also influence daily life, pregnancy, birth, and postpartum period. The studies have revealed that sleep problems experienced during pregnancy cause pregnancy hypertension, glucose intolerance, prolonged labor, perceiving more pain during births, high rates of cesarean section, preterm births, and postpartum depression (Okun et al., 2011; Dorheim et al., 2012; Thomfohr et al., 2015; Haney et al., 2014; Herring et al., 2014; O'Brien et al., 2013; Howe et al., 2015; Hutchisonet al., 2012).

In studies on sleep quality in pregnancy; the effects of sleep quality on pregnancy, birth, and fetal distress have been examined (Ko et al., 2010; Sadeh et al., 2011; Tikotzky &Sadeh, 2009; Sadeh et al., 2010; Kawada, 2016; Facco et al., 2010). The effect of parental behaviors and traditional methods was examined in studies evaluating sleep health and habits of infant (Sadeh et al., 2011; Tikotzky & Sadeh, 2009).

Results of the study evaluating the relationship between sleep quality during pregnancy and sleep duration of newborn have not been found in the literature. Therefore, this study was conducted in order to determine the relationship between sleep quality level of pregnant women in third trimester and sleep duration of newborns.

Research question: Is there a relationship between sleep quality of pregnant women in third trimester and sleep duration of newborns?

METHODS

Study Design and Setting

This study was designed longitudinal, correlation study. In this study, the relationship between sleep quality of pregnant in the seventh, eighth, and ninth months and sleep quality of newborns was assessed.

The population of the study consisted of 169 pregnant who were registered to two family health centers between January 2015 and December 2015 and were in the seventh month

of pregnancy (in the 28th gestational week). All pregnant women in the seventh month of pregnancy were included in the study within the specified dates without using sampling method. However, a total of 22 pregnant were excluded from the study since three pregnant gave preterm birth, three pregnant women did not want to continue, and 16 pregnant could not be reached in following months and the study was completed with 147 pregnant. All newborns who are followed in the survey are breastfeeding and newborn's having no colic

Introductory information form and The Pittsburgh Sleep Quality Index (PSQI)were filled by researcher for pregnant meeting the inclusion criteria of the study.

PSQI was applied in the seventh, eighth, and ninth months of pregnancy in family health center. The data were collected by using face-to-face interview method. It took 15-20 minutes to collect the data. The mothers recorded sleep duration of newborns as daytime and night on sleep follow-up chart, which was prepared by the researcher.

The Inclusion Criteria of the Study;

- Pregnant 's having no risky pregnancy (placenta praevia, preeclampsia, early membrane rupture, etc.)
- Pregnant's having no psychiatric history
- Pregnant's experiencing no sleep problem before pregnancy
- Pregnant's using no sleeping pill
- Pregnant's having no infant with low birth weight (>2000 gr)
- Newborn's having no colic
- Newborn's being breastfed sufficiently at daytime and night.

Instruments

The data of the study were collected by using "Introductory Information Form", "Newborn Sleep Follow up Chart", and "(PSQI)".

The introductory information form, prepared by the researcher included a total of 12 questions including socio-demographic and obstetric characteristics of the pregnant women as well as their sleep duration and quality. A chart was prepared by the researcher to evaluate newborn's sleep duration and sleep duration was recorded during the day (day and night) for 28 days. PSQI was used in order to assess sleep quality of the pregnant women in the study. This index was developed by Buysse et al., in 1989 to assess sleep quality in psychiatric applications and clinical researches. The validity and reliability studies of this index in Turkey were conducted by Ağargün et al., in 1996, and the Cronbach's alpha reliability coefficient of the index was 0.80. In this study, Cronbach's alpha coefficient of the index was found as 0.82

in the seventh month, 0.78 in the eighth month, and 0.80 in the ninth month. PSQI evaluates sleep quality within last one month. Components of the index was grouped as Subjective sleep quality (1), Sleep latency (2), Sleep Duration (3), Sleep efficiency (4), Sleep disturbances (5), Use of sleeping medications (6), and Daytime dysfunction (7). Each item is scored between 0-3 points. Total of 7 component scores gives PSQI total score. The index has a value between 0 and 21. Total sleep quality is classified as good (0-4 points) and bad (5-21 points).

Data Analysis

SPSS version 22 was used for all analyses. Percentages for determining descriptive characteristics of pregnant and newborns, mean for determining sleep quality of pregnant and sleep duration of newborns, and Pearson's correlation analysis for determining the correlation between sleep quality of pregnant and sleep duration of newborns were used.

RESULTS

Table 1. Distribution of The Pregnant in Terms of Socio-Demographic Characteristics

Characteristics (N=147)	n	%
Age		
15-19	10	6.8
20-24	33	22.4
25-29	55	37.4
30-34	28	19.1
35-39	19	12.9
40 and older	2	1.4
Employment Status		
Employed	28	19.0
Unemployed	119	81.0
Educational Background		
Illiterate	20	13.6
Primary Education	73	49.7
High school	20	13.6
University	34	23.1
Economic condition		
Income lower than expense	49	33.4
Income equal to expense	90	61.2
Income higher than expense	8	5.4
Number of pregnancy		
Primiparous	44	29.9
Multiparous	103	70.1
Total	147	100.0

It was found that 37.4% of the pregnant were in the age range of 25-29 years, 81% were housewives, 49.7% were primary school graduate, 61.2% had an income equal to expense, and 70.1% were multiparous (Table 1).

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Table 2. Sleep Quality Mean Scores of The Pregnant

Components of Scale	7thmonth X±sd	8th month X±sd	9th month X±sd	Total X±sd
Subjective sleep quality	1.21±0.54	1.37±0.55	1.65±0.66	1.41±0.50
Sleep latency	0.81±0.81	0.97±0.91	1.29 ±1.06	1.02±0.84
Sleep duration	0.56±0.79	0.62±0.81	0.77±0.91	0.65±0.78
Habitual sleep efficiency	0.44±0.87	0.44±0.81	0.65±1.08	0.51±0.81
Sleep disturbances	0.83±0.46	0.87±0.39	1.04±0.38	0.91±0.33
Use of sleeping medication	0.00±0.00	0.00±0.08	0.00±0.08	0.00±0.00
Daytime dysfunction	0.39±0.65	0.48±0.61	0.76±0.76	0.54±0.58
Total PSQI	4.24±2.78	4.76±2.78	6.17±3.10	5.06±2.74

*Total score's being ≥ 5 indicates that sleep quality is low.

Sleep quality of the pregnant impaired as duration of pregnancy progressed. Sleep quality mean score of the pregnant was found to be 4.24±2.78 in the seventh month; 4.76 ±2.78 in the eighth month; and 6.17 ±3.10 in the ninth month; and their sleep quality total score was 5.06±2.74 (Table 2).

Table 3. Mean Sleep Duration of The Newborns

Time	X±sd
Day	9.15±1.30
Night	8.50±1.30
Daily Total	17.65±1.83

Daytime mean sleep duration of the newborns was found to be higher (9.15±1.30) compared to their night mean sleep duration (8.50±1.30). Their daily sleep duration was averagely 17 hours (17.65±1.83) (Table 3).

Table 4. Comparison of The Pregnant's Sleep Quality and the Newborns' Sleep Duration

Group	Daytime Sleep Duration of Newborn X±sd	Night Sleep Duration of Newborn X±sd	Daily Sleep Duration of Newborn X±sd
*Sleep quality<5	9.12 ±1.46	8.50 ±1.36	17.62 ±2.00
**Sleep quality ≥5	9.18 ±1.06	8.49 ±1.24	17.67 ±1.60
Test value and p	t=0.66 **p=0.043**	t=0.015 p=0.582	t=0.178 p=0.071

*n=82 **n=64

Daytime and daily sleeping times of newborns of pregnants with high sleep quality were found to be slightly higher. However, night sleep duration and daily sleep duration of newborn is not statistically significant (Table 4).

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Table 5. Correlation Between Sleep Quality of the Pregnant's and Sleep Duration of the Newborns

	Sleep Duration of the Newborns							
	7th month		8th month		9th month		Last trimester	
Scale	r	P	r	P	r	P	r	P
Subjective sleep quality	-.028	.740	-.059	.476	-.136	.101	-.092	.269
Sleep latency	-.193*	**.019**	-.128	.123	-.124	.136	-.160	.053
Sleep duration	-.027	.744	.080	.336	.020	.815	.026	.755
Habitual sleep efficiency	018	.829	.047	.569	.019	.815	.031	.709
Sleep disturbances	-.072	.387	-. 217**	**.008**	-.186*	**.024**	-.191*	**.020**
Use of sleeping medication	-	-	.066	.429	-.001	.993	.046	.579
Daytime dysfunction	-.210*	**.011**	-.140	.091	-.088	.288	-.166*	**.044**
Total PSQI	-.124	.136	-.074	.372	-.100	.229	-.106	.200

There was a negative correlation between sleep latency and daytime dysfunction and newborn sleep duration in the seventh month of pregnancy.

There was a negative correlation between sleep disturbences and newborn sleep duration In the eighth month of pregnancy in the eighth month of pregnancy.

There was a negative correlation between sleep disturbences, daytime dysfunction and newborn sleep duration in the ninth month of pregnancy.

As sleep latency, sleep disturbances, and daytime dysfunction of the pregnant women increased, sleep duration of the newborns decreased (Table 5).

DISCUSSION

The results of the study conducted to determine the relationship between sleep quality of pregnant women in the third trimester and sleep duration of newborns were discussed with relevant literature.

Sleep problems in pregnancy starts with hormonal changes and are experienced in the last trimester more intensively (Pien & Schwab, 2004; Okun et al., 2013; Howe et al., 2015; Okun et al., 2009; Okun et al., 2012; Drager et al., 2013). It was reported in a previous study that prevalence of sleep problems associated with sleep quality in pregnancy was between 64% - 86% (Hutchison et al., 2012; Pien at al., 2005). Sleep quality of pregnancies decreased as pregnancy month progressed. Sleep quality mean score was above five in the ninth month of pregnancy (Table 2). This condition might be associated with the complaints such as frequent urination, growth of fetus, frequent breathing, and leg cramps which are seen in the last months of pregnancy.

In the study, mean sleep duration of the newborns was found to be nine hours for daytime and eight hours for night. Daily total mean sleep duration was 17 hours (Table 3). Sleep quality of the newborns is directly associated with healthy growth and development

(Guilleminault, 1992). According to literature, a healthy normal newborn sleeps for averagely 16-18 hours in 2-3 hour periods. Sleep duration of the newborns included in the study was found to be compatible with literature finding. This was associated with the fact that the mothers did not have poor sleep quality in the seventh and eighth months and the impairment in sleep quality occurred in the ninth month.

In addition, the fact that the newborns had no nutrition problem and their mothers breastfed them effectively at daytime and night was thought to be associated with the fact that sleep duration of the newborns was compatible with literature.

Sleep quality during pregnancy and daytime sleep duration of newborns were found to be statistically significant (Table 4). This significance in daytime sleep duration of newborns might be resulted from correlation between the subscales of sleep latency and daytime dysfunction in the seventh month of pregnancy and the subscale of sleep disturbance in the eighth and ninth months and sleep duration of newborn. Because there has been no study evaluating sleep duration of newborns and sleep during pregnancy, these results might be supported or denied with future studies.

In the study, any relationship was not determined between total sleep quality of the pregnant women in the seventh, eighth, and ninth months and sleep duration of the newborns. However, as sleep latency and daytime dysfunction in the seventh month of pregnancy, sleep disturbance in the eighth and ninth month of pregnancy, and sleep disturbance and daytime dysfunction in the last trimester of pregnancy increased, sleep duration of the newborns decreased (Table 5). Neurological system could not develop completely with birth of infant. Development of neurological system starts from intrauterine life and continues until the fourth year of life. Sleep and wake system also is regulated with development of central nervous system (Taylor, 2006). Newborn period allows to observe the effects of infant's intrauterine period during extrauterine period. Therefore, the effect of sleep quality during pregnancy can be evaluated better in newborn period. The fact that sleep duration of newborn in the study was compatible with the literature could be associated with the fact that pregnant women had a good total sleep quality in the last trimester. However, the correlation between the subscales may be explained by the significant correlation between daytime sleep duration of newborns and sleep quality during pregnancy.

SONUÇLAR

It was found that as pregnancy proceeded, sleep quality impaired. There was a significant correlation between sleep quality score of the pregnant women during the last trimester and daytime sleep duration. As sleep latency and daytime dysfunction of pregnant women in the seventh month and sleep disturbance in the eighth and ninth months increased, sleep duration of the newborns decreased. Sleep duration of newborns decreased as sleep disturbances and daytime dysfunction increased in three-month mean sleep quality of pregnant. Midwives and nurses can evaluate sleep qualities of the pregnant during the antenatal control. Thus, newborns may contribute to the increase in sleep duration.

It is recommended to conduct randomized controlled studies on this research subject and with larger sample groups.

Midwives and nurses can evaluate sleep qualities of the pregnant during the antenatal control. Thus, newborns may contribute to the increase in sleep duration.

Conflict of interest

The authors declare no conflict of interests.

Funding

No funding was received for this study.

Acknowledgement

I would like to thank mothers who volunteer to participate in research.

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