Athens Journal of Health & Medical Sciences – Volume10, Issue 2, June 2023 – Pages 129-142

Examination of the Relation between Sleep Quality during Pregnancy and Adaptation to Pregnancy[1]

By Gül Taybe Arkalı[*] & Keziban Amanak[±]

This study was conducted to examine the relation between sleep quality in pregnancy and adaptation to pregnancy. The study had included 369 pregnant women presenting to the obstetric and gynecological outpatient clinic. The study had an analytical and cross-sectional design. Data was collected by using a sociodemographic and obstetric characteristics form, the Pittsburgh Sleep Quality Index and the acceptance of pregnancy subscale of the Prenatal Self-Evaluation Questionnaire. Obtained data was evaluated using descriptive statistics, analysis of variance, and Pearson correlation analysis. The mean score on the Pittsburgh Sleep Quality Index was 9.49±2.88 and the mean score on acceptance of pregnancy was 20.95±6.59. The mean scores for the Pittsburgh Sleep Quality Index, its subscales and acceptance of pregnancy increased from the first trimester to the third trimester and this difference was statistically significant. Also, a significant, moderate, positive correlation was found between the sleep quality of the pregnant women and their adaptation to pregnancy according to their trimesters. It can be concluded that the sleep quality of the pregnant women was poor in general but that the level of their adaptation to pregnancy was good. The sleep quality and adaptation to pregnancy decreased as pregnancy progressed throughout all the trimesters.

Keywords: *adaptation, pregnancy, sleep quality, trimester*

Introduction

Pregnancy is a period when women have the most precious and special memories of their life. It is important to protect physical and mental health of pregnant women to ensure their adaptation to pregnancy and to help them and their baby stay healthy and peaceful during pregnancy, labor and postpartum period. Sleep is needed to healthily adjust to biological and psychological changes in pregnancy (Köybaşı and Oskay 2017, Yeral 2019, Yeşilkaya 2018). A sleep problem experienced in pregnancy can lengthen the time to get prepared for motherhood roles. A disrupted sleep quality in pregnancy causes women to feel more nervous, become more tired, experience more difficulty in adaptation and have increased fear and anxiety and has a negative impact on adaptation to pregnancy (Özhüner and Çelik 2019, Öztürk et al. 2019). In a study by Yeral (2019), women in the first trimester experienced significantly more problems in terms of sleep latency, habitual sleep pattern and sleep disorders compared to women in the second trimester. Besides, women in the third trimester experienced significantly more problems regarding sleep latency, sleep quality and sleep

[*]Midwife, Cihanbeyli State Hospital, Turkey.
[±]Associate Professor, Aydın Adnan Menderes University, Turkey.
[1]This study was conducted as a master project submitted to the Institute of Health Sciences, Aydın Adnan Menderes University.

https://doi.org/10.30958/ajhms.10-2-4 doi=10.30958/ajhms.10-2-4

disorders compared to women in the first trimester (Yeral 2019). Many other studies also showed a decrease in total sleep time, daytime sleepiness, disrupted night sleep and increased frequency of sleeplessness in the third trimester (Çelik and Köse 2017, Köybası and Oskay 2017, Özorhan et al. 2014, Öztürk et al. 2019). Çoban and Yanıkkerem (2010) found a negative relation between gestational week and sleep quality and noted that as the gestational week increased, the sleep quality decreased (Çoban and Yanıkkerem 2010). In a cross-sectional study with 386 pregnant women, a high rate of the women in the third tirmester had a poor sleep quality and the risk of poor sleep quality was 8.6 times higher in the third trimester than in the other trimesters (Özhüner and Çelik 2019).

Adaptation to pregnancy can be affected by poor sleep quality as well as many factors including physiological, psychological and emotional changes and social environment. It has been stated in the literature that sleep problems in pregnancy can cause hypertension in pregnancy, prolonged labor, preterm delivery and that tiredness and stress due to insufficient sleep result in more severe perceived labor pain, higher cesarean section rates and postpartum depression. As a result, maladaptation in pregnancy may arise as part of the negative effects of pregnancy-related sleep problems mentioned above (Beydağ and Mete 2008, Ko et al. 2010, Yurtsal and Eroğlu 2019). Although sleep problems in pregnancy may lead to numerous undesirable conditions in both pregnancy, labor and postpartum period, health professionals are not much aware of it since these problems are considered as normal (Hutchison et al. 2012, Köybaşı and Oskay 2017, Rezaei et al. 2013). To protect mental health of the women in pregnancy, to help them tolerate pregnancy-related physiological, psychological and hormonal changes and to adapt to pregnancy, prenatal healthcare should involve strategies to increase their sleep quality (Gao et al. 2019). It is important to evaluate sleep quality in pregnant women in order to inform them about this issue, to prevent problems likely to arise and to help them experience a healthy labor process (Çoban and Yanıkkerem 2010, Köybaşı and Oskay 2017, Özhüner and Çelik 2019). However, there have not been any studies that examined sleep quality in pregnancy and adaptation to pregnancy. Therefore, the present study was directed towards examining the relation between sleep quality in pregnancy and adaptation to pregnancy.

Research Questions

1. What is the sleep quality level of pregnant women?
2. Does the sleep quality level of pregnant women differ between trimesters?
3. What is the level of adaptation of pregnant women to pregnancy?
4. Does the level of adaptation of pregnant women to pregnancy differ between trimesters?
5. Is there a relation between the sleep quality of pregnant women and their adaptation to pregnancy?
6. Is there a relation between the sleep quality of pregnant women and their adaptation to pregnancy according to trimesters?

Material and Methods

Design

This analytical and cross-sectional study was performed in the obstetrics and gynecology outpatient clinic of at Cihanbeyli State Hospital in Konya City Center between 15 March 2020 1 and 15 March 2021.

Study Participants

A total of 369 pregnant women were included in the study through convenience sampling. Out of 369 women, 123 were in their first trimester, 123 were in their second trimester and 123 were in their third trimester. The sampling size was calculated with G-Power. According to this calculation, the sample size sufficient to achieve 80% power of the study was found to be minimum 352 by using the mean scores for the Pittsburg Sleep Quality Index (PSQI) in the first and third trimesters in the study titled "Sleep Quality and Tiredness in Pregnant Women by Çoban and Yanıkkerem (2010) and based on the effect size of 0.55 in the t-test, the statistical significance of α=0.05 and the confidence interval of 95%. Pregnant women at least graduating from primary school, speaking and writing in Turkish, aged 18 years or older, having a single fetus and a low risk of pregnancy and accepting to participate in the study were included in the sample. Exclusion criteria were a high risk of pregnancy with a pregnancy-related complication. A total of 424 pregnant women were invited to participate in the study. Forty-five women were not included in the study since they did not fulfill the inclusion criteria (Nine were illiterate, 27 declined to participate in the study, seven were younger than 18 years old and two could not speak and understand Turkish). As a result, data were collected from 379 pregnant women. Since ten women did not fill in the data collection tools completely, data collected from them were not included in the analysis and the study was completed with 369 pregnant women.

Data Collection

Data were collected with a sociodemographic and obstetric characteristics form, the The Pittsburgh Sleep Quality Index (PSQI) and the Acceptance of Pregnancy Subscale of Prenatal Self-Evaluation Questionnaire (PSEQ-AP).

Sociodemographic and Obstetric Characteristics Form; was prepared by the researchers. It is composed of a total of 12 questions about sociodemographic and obstetric characteristics (Yeşilkaya 2018, Çoban and Yanıkkerem 2010).

The Pittsburgh Sleep Quality Index (PSQI); is a self-report questionnaire and was developed by Buysse et al. in 1989 to determine the sleep quality, type of sleep disturbance and severity of sleep disturbance (Buysse et al. 1989). It has seven components, i.e., subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication and daytime dysfunction. Each component is scored from zero to three and scores for seven components are added to obtain a total score for the PSQI, which may range

between zero to 21. The cut-off value for the PSQI is five. A score of five or more shows a low sleep quality (Aktaş et al. 2015, Şenol et al. 2012). The validity and reliability of the PSQI for the Turkish population were tested by Ağargün et al. (1996) and Cronbach's alpha for the PSQI was reported to be 0.804 (Ağargün et al. 1996). Cronbach's alpha was found to be 0.759 in the present study. Data collected with the PSQI in this study was self-reported by the participants.

The Acceptance of Pregnancy Subscale of the Prenatal Self-Evaluation Questionnaire (PSEQ-AP); was created by Lederman et al. in 1979 to evaluate adaptation of prenatal women to pregnancy and motherhood roles (Beydağ and Mete 2008, Lederman et al. 1979). The scale does not have a cut-off value. It has seven subscales, i.e., Wellbeing of self and baby in labor, acceptance of pregnancy, identification with motherhood role, preparation for labor, helplessness and loss of control in labor, relation with partner/husband and relationship with mother. The highest and lowest scores for the scale are 316 and 79 respectively (Lederman et al. 1979). Lower scores for the scale show successful adaptation to pregnancy and motherhood roles. Cronbach's alpha for the scale in pregnancy was found to be 0.72-0.87 in studies performed in Sweden (Kiehl and White 2003). The validity and reliability of the scale for the Turkish population were tested by Beydağ and Mete in 2008. Cronbach's alpha for acceptance of pregnancy in the Turkish version was reported to be 0.80 (Beydağ and Mete 2008). This subscale is composed of 14 items. The highest and lowest scores for it are 56 and 14 respectively. Lower scores for the subscale acceptance of pregnancy show increased acceptance of pregnancy (Beydağ and Mete 2008, İşbir 2011). In the present study, this subscale was utilized to determine what extent pregnant women accepted their pregnancy and to evaluate their adaptation to pregnancy. Cronbach's alpha for it was found to be 0.79.

Piloting

Expert opinion about the sociodemographic and obstetric characteristics form, developed by the researchers, was requested from five lecturers specializing in Midwifery and Maternal Health and Diseases Nursing. It was piloted on ten pregnant women in the outpatient clinic where the study was performed to test its understandability and practicality. According to the piloting test, the form did not need to be revised. Besides, the pregnant women participating in the piloting study were not included in the study sample.

Ethical Considerations

Ethical approval was obtained from the ethical committee for 3 non interventional researches at Adnan Menderes University Health Sciences Faculty on 3 March 2020 (approval number: E.15226). Written permission was taken from Konya City Health Directorate to conduct the study in Cihanbeyli State Hospital in Konya, Turkey. The women participating in the study were informed about the aim of the study, time needed to fill in the data collection tools, voluntary basis for participation in the study and their right to leave the study whenever they wanted.

They were also assured that the data collected would not be used for purposes other than research. Questions asked by the women were answered and their informed consent was obtained. Permission was also obtained through email from Prof. Mehmet Yücel Ağargün to use the PSQI and from Assoc. Prof. Kerime Derya Beydağ to use the acceptance of pregnancy subscale of the PSEQ.

Data Analyses

Data was analyzed with the Statistical Package for Social Sciences-18 (PASW Inc., Chicago. IL. USA) by using numbers, percentages, mean values and standard deviation. Besides, variance analysis was employed to compare sleep quality and adaptation to pregnancy between trimesters. Pearson correlation analysis was performed to examine the relation between sleep quality and adaptation to pregnancy.

Results

Sociodemographic and obstetric features of the pregnant women included in the study are presented in Table 1. Thirty-five-point-five percent of the women were secondary school graduates. Most of the women (82.9%) were unemployed, more than half of the women (62.1%) had an income equal to their expenses and nearly half of the women (44.2%) were living in a town. Besides, more than half of the women (57.7%) had a nuclear family, most of the women (73.2%) had a health insurance. The mean age of the women was 27.15±5.72 years and the mean number of live children was 1.78±0.85. The median number of pregnancies was 2, the median number of spontaneous abortions was 1, the median number of induced abortions was 1 and the median number of stillbirths was 1.

The mean scores for the PSQI, its subscales and the PSEQ-AP are presented in Table 2. The mean score for the PSQI was 9.49 ± 2.88 and the mean scores for its subscales were as follows: 1.12 ± 0.77 for subjective sleep quality, 2.06 ± 0.71 for sleep latency, 1.86 ± 0.65 for sleep duration, 1.21 ± 1.19 for habitual sleep efficiency, 1.79 ± 0.63 for sleep disturbance and 1.45 ± 0.62 for daytime dysfunction. The mean score for the PSEQ-AP was 20.95 ± 7 6.59.

Table 1. *Sociodemographic and Obstetric Characteristics of the Women (n=369)*

Characteristics	Variables	N	%
Education	Primary school	76	20.6
	Secondary school	131	35.5
	High school	89	24.1
	University	73	19.8
Employment	Yes	63	17.1
	No	306	82.9
Income	Income lower than expenses	90	24.3
	Income equal to expenses	229	62.1
	Income higher than expenses	50	13.6
Place of living	City	38	10.3
	Town	163	44.2
	Small town	35	9.5
	Village	133	36.0
Type of family	Nuclear family	213	57.7
	Extended family	153	41.5
	Separated parents	3	0.8
Health insurance	Yes	270	73.2
	No	99	26.8
Characteristics	**Mean/Median**	**SD/Min-Max**	
Age (years)	27.15	5.72	
Number of live children	1.78	0.85	
Number of pregnancies	2	1-10	
Number of spontaneous abortions	1	1-4	
Number of induced abortions	1	1-2	
Number of stillbirths	1	1-2	

Table 2. *The Mean Scores for the PSQI, its Subscales and the PSEQ-AP (n=369)*

Scales & Subscales	Mean	SD
PSQI		
Subjective sleep quality	1.12	0.77
Sleep latency	2.06	0.71
Sleep duration	1.86	0.65
Habitual sleep efficiency	1.21	1.19
Sleep disturbance	1.79	0.63
Use of sleeping medication	0.00	0.00
Daytime dysfunction	1.45	0.62
PSQI	9.49	2.88
PSEQ-AP	20.95	6.59

Table 3 outlines a comparison of the mean scores for the PSQI, its subscales and the PSEQ-AP between trimesters. The mean scores for the PSQI and its subscales displayed an increase from the first trimester until the third trimester with a significant difference ($p<0.05$ for the PSQI and each subscale). According to the results of Scheffe test, performed to determine which pairs of trimesters differed in the mean scores for the PSQI and its subscales, the mean scores for the PSQI and its subscales were significantly lower in the first trimester than in the second and third trimesters. The mean scores for the PSQI and its subscales were also significantly lower in the second trimester than in the third trimester.

The mean score for the PSEQ-AP increased from the first trimester till the

third trimester with a significant difference (p=0.001). According to the results of Scheffe test, the mean score for acceptance of pregnancy was significantly lower in the first trimester than in the second and third trimesters and was significantly lower in the second trimester than in the third trimester (Table 3).

Table 3. *The Comparison of the Mean Scores for the PSQI, its Subscales and the PSEQ-AP between Trimesters (n=369)*

	1st Trimester Mean±SD (a)	2nd Trimester Mean±SD (b)	3rd Trimester Mean±SD (c)	ANOVA (f) P	Post hoc
PSQI					
Subjective sleep quality	1.05±0.52	1.07±0.39	1.25±0.65	f=6.256 p=0.003	(a) vs. (b): 0.002 (a) vs. (c): 0.001 (b) vs. (c): 0.013
Sleep latency	2.01±0.44	2.03±1.45	2.13±0.74	f=4.355 p=0.006	(a) vs. (b): 0.012 (a) vs. (c): 0.004 (b) vs. (c): 0.005
Sleep duration	1.75±0.39	1.80±0.14	2.02±0.65	f=3.256 p=0.021	(a) vs. (b): 0.001 (a) vs. (c): 0.004 (b) vs. (c): 0.001
Habitual sleep efficiency	1.15±1.65	1.18±0.32	1.30±0.41	f=5.142 p=0.018	(a) vs. (b): 0.003 (a) vs. (c): 0.002 (b) vs. (c): 0.001
Sleep disturbance	1.51±0.45	1.58±1.21	2.30±0.39	f=7.235 p=0.017	(a) vs. (b): 0.001 (a) vs. (c): 0.001 (b) vs. (c): 0.002
Daytime dysfunction	1.22±0.74	1.26±0.41	1.86±1.23	f=4.256 p=0.009	(a) vs. (b): 0.004 (a) vs. (c): 0.005 (b) vs. (c): 0.005
PSQI	9.01±1.45	9.04±0.79	10.40±1.21	f=6.589 p=0.002	(a) vs. (b): 0.001 (a) vs. (c): 0.002 (b) vs. (c): 0.001
PSEQ-AP	19.97±0.41	20.02±0.85	22.85±3.62	f=5.789 p=0.001	(a) vs. (b): 0.003 (a) vs. (c): 0.003 (b) vs. (c): 0.001

Table 4 demonstrates the relation between the mean scores for the PSQI, its subscales and acceptance of pregnancy. There was a significant moderate positive relation between the mean score for acceptance of pregnancy and the mean scores for subjective sleep quality ($r = 0.452$, $p<0.001$), sleep latency ($r = 0.523$, $p<0.001$), sleep duration ($r = 0.461$, $p<0.001$), habitual sleep efficiency ($r = 0.652$, $p<0.001$), sleep disturbance ($r = 0.396$, $p<0.001$), daytime dysfunction ($r = 0.685$, $p<0.001$) and the PSQI ($r = 0.541$, $p<0.001$).

Table 4. *The Relation between the Mean Scores for the PSQI, its Subscales and the PSEQ-AP (n=369)*

PSQI	PSEQ-AP	
	r	p
Subjective sleep quality	0.452	<0.001
Sleep latency	0.523	<0.001
Sleep duration	0.461	<0.001
Habitual sleep efficiency	0.652	<0.001
Sleep disturbance	0.396	<0.001
Use of sleeping medication	-	-
Daytime dysfunction	0.685	<0.001
PSQI	0.541	<0.001

Table 5 shows the relation between the mean scores for the PSQI, its subscales and the mean score for the PSEQ-AP according to trimesters. There was a significant moderate positive relation between the mean score for acceptance of pregnancy and the mean scores for the PSQI and its subscales in the first, second and third trimesters.

Table 5. *The Relation between the Mean Scores for the PSQI, its Subscales and the Mean Score for the PSEQ-AP according toTtrimesters (n=369)*

		PSEQ-AP		
		1st Trimester	**2nd Trimester**	**3rd Trimester**
PSQI				
Subjective sleep quality	**r**	0.301	0.412	0.463
	p	0.008	0.014	0.001
Sleep latency	**r**	0.314	0.541	0.412
	p	0.004	0.001	0.012
Sleep duration	**r**	0.306	0.469	0.542
	p	0.001	0.041	0.007
Habitual sleep efficiency	**r**	0.345	0.423	0.574
	p	0.005	0.004	0.003
Sleep disturbance	**r**	0.305	0.574	0.413
	p	0.021	0.011	0.002
Daytime dysfunction	**r**	0.345	0.582	0.528
	p	0.003	0.001	0.013
PSQI	**r**	0.317	0.516	0.434
	p	0.012	0.007	0.001

Discussion

This analytical and cross-sectional study directed towards examining the relation between sleep quality and adaptation to pregnancy revealed that the pregnant women had a poor sleep quality, but they adapted to pregnancy well. As the trimesters progressed, sleep quality and adaptation to pregnancy decreased. However, a high sleep quality paralleled an improved adaptation to pregnancy throughout all the trimesters.

The finding that the women had the mean PSQI score of 9.49±2.88 is of importance in that it is higher than the cut-off value for the scale and indicates a poor sleep quality. Consistent with this finding, Öztürk et al. (2019) revealed in their study with 204 pregnant women that the mean PSQI score was 7.27±3.18. In a study with 152 healthy pregnant women followed in an obstetric and gynecological clinic of a university hospital, Çelik and Köse (2017) found the mean PSQI score of 7.38±4.91. Pınar et al. (2014) showed in their study that the mean score for the PSQI was 5.13±3.35. Besides, the mean score for the PSQI was reported to be 10.04±2.98 by Özhüner and Çelik (2019) in their study with 386 pregnant women followed in three family healthcare centers and 7.11±3.55 by Köybaşı and Oskay (2017). In a meta-analysis including 24 studies from 12 different countries, Sedov et al. (2018) found that the mean score for the PSQI was 6.07±0.40. Compatible with the literature, the mean score for the PSQI in the present study was ≥5. The finding is of importance since it is an indicator of a poor sleep quality in the

pregnant women. Sleep quality is affected during pregnancy due the reasons such as physical and hormonal changes, anxiety, and increased abdominal discomfort due to growing fetus putting pressure on the diaphragm. Furthermore, accordıng to the literature, sleep qualıty during pregnancy is affected by many factors (Salbacak 2021, Amanak 2021, Sarınç and Ünlü 2014). The results that they emphasize the necessity of examining the factors that negatively affect sleep quality during pregnancy.

In the current study, the mean scores for the PSQI and its subscales displayed an increase from the first trimester until the third trimester. Further analyses showed that the pregnant women had the best sleep quality in the first trimester and the worst sleep quality in the third trimester. Congruent with the current study, there have been studies revealing that sleep quality worsened from the first trimester till the third trimester (Çoban and Yanıkkerem 2010, Köybaşı and Oskay 2017, Sharma and Franco 2004, Taşkıran 2011). However, some studies showed that pregnant women had the highest sleep quality in the second trimester and the poorest sleep quality in the third trimester (Çelik and Köse, 2017, Kostanoğlu et al. 2019, Pınar et al. 2014). In light of the evidence from both the present study and other studies reported in the literature, it is clear that pregnant women have a lower sleep quality in the third trimester than in the first and second trimesters. The reason why some studies revealed that pregnant women have the highest sleep quality in the first trimester while other studies showed that pregnant women have the highest sleep quality in the second trimester can be limitations of the studies or sociodemographic features of the pregnant women.

In the present study, the mean score for the PSEQ-AP was 20.95±6.59. The highest and the lowest scores that can be obtained for the PSEQ-AP are 56 and 14 respectively. It is reported that lower scores indicate increased acceptance of pregnancy (Beydağ and Mete 2008, İşbir 2011). It can be suggested that the pregnant women in the present study had sufficient adaptation to pregnancy. There have not been any studies on the relation between adaptation to pregnancy and sleep quality. However, many studies have been performed to examine adaptation to pregnancy. The mean score for acceptance of pregnancy was found to be 23.12±7.40 in a study performed by Demirbaş and Kadıoğlu (2014) to evaluate adaptation of prenatal women to pregnancy and associated factors, 30.1±8.8 in a study conducted by Bulut and Özdemir (2019) with pregnant women diagnosed as hyperemesis gravidarum and staying in a hospital. Besides, İşbir (2011) found in a study on the effect of a Roy's adaptation model based counseling on nausea and vomiting in pregnancy that the mean score for acceptance of pregnancy was 24.64±8.86 in the intervention group and 26.64±8.14 in the control group at baseline. In another study on the effect of Roy's adaptation model based education on gestational hypertension, adaptation to pregnancy and pregnancy outcomes, the mean score for acceptance of pregnancy was 44.12±11.09 in the intervention group and 40,89±10,56 in the control group at baseline (Amanak et al. 2019). Özçalkap (2018) showed that the mean score for acceptance of pregnancy was 45.46±6.81 in a sample representing the population of a city. As shown by the studies mentioned above, the mean scores for acceptance of pregnancy have a wide range. This suggests that acceptance of and adaptation to pregnancy are

affected by many factors. The present study showed that sleep quality in pregnancy was found to be a significant factor affecting acceptance of pregnancy. Further well-designed randomized controlled studies focusing on the effect of sleep quality on acceptance of pregnancy can contribute to maternal-child health.

In the current study, the mean score for acceptance of pregnancy significantly increased from the first trimester until the third trimester and further analyses revealed that adaptation to pregnancy decreased with the progression of pregnancy. However, conflicting with the current study, few studies have shown no relation between adaptation to pregnancy and gestational weeks (Demirbaş and Kadıoğlu 2014, Özçalkap 2018). Further studies are needed to elucidate this relation.

In the present study, the finding of the significant, moderate positive relation between the mean score for acceptance of pregnancy and the mean scores for the PSQI and its subscales throughout all the trimesters showed that as sleep quality declined so did adaptation to pregnancy. To our knowledge, there have not been any studies examining the relation between sleep quality and acceptance of pregnancy. However, it has been noted in the literature that pregnant women having difficulty in accepting pregnancy have poor adaptation to both pregnancy and motherhood and experience many fears about labor (Demirbaş and Kadıoğlu 2014, Lederman and Wels 2009). The information from both the present study and other studies indicate that randomized, controlled experimental studies are necessary to examine the relation between sleep quality in pregnancy and adaptation to pregnancy.

Conclusion

In the present study, although the pregnant women had a poor sleep quality, they had successful adaptation to pregnancy. It was observed that both sleep quality and adaptation to pregnancy decrease as pregnancy progresses, and as sleep quality increases, adaptation to pregnancy increases throughout all trimesters. In light of these findings, interventions directed towards enhancing the sleep quality that is effective in acceptance of and adaptation to pregnancy should be offered to pregnant women through structured education programs. It can be recommended that healthcare managers and decision-makers integrate structured education programs directed towards improving sleep quality in pregnancy into available prenatal care and raise awareness of health professionals through in-service training programs.

Limitations

This study has two limitations. First, the data collected was self-reported by the pregnant women participating in the study and only represent the study sample. Second, data collection was performed during COVID-19 pandemic. The participants might have felt uncomfortable during data collection since they had to

wear a mask and practice social distancing to reduce the risk of disease transmission. Therefore, they might have given responses which did not completely reflect their actual status.

References

Ağargün MY, Kara H, Anlar O (1996) Pittsburgh Uyku Kalitesi İndeksi'nin geçerliği ve güvenirliği. (The validity and reliability of the Pittsburgh Sleep Quality Index). *Türk Psikiyatri Dergisi* 7(2): 107–111.

Aktaş H, Şaşmaz CT, Kılınçer A, Mert E, Gülbol S, Külekçioğlu D, et al. (2015) Yetişkinlerde fiziksel aktivite düzeyi ve uyku kalitesi ile ilişkili faktörlerin araştırılması. (Study on the factors related to physical activity levels and sleep quality in adults). *Mersin Üniversitesi Sağlık Bilimleri Dergisi* 8(2): 60–70.

Amanak K (2021) Effects of restless leg syndrome on the qualıty of lıfe and sleep durıng pregnancy: a case-control study. *Journal of Inonu University Health Services Vocational School* 9(1): 1–9.

Amanak K, Sevil Ü, Karacam Z (2019) The impact of prenatal education based on the Roy adaptation model on gestational hypertension, adaptation to pregnancy and pregnancy outcomes. *Journal of Pakistan Medical Association* 69(1): 11–17.

Beydağ KD, Mete S (2008) Prenatal Kendini Değerlendirme Ölçeğinin geçerlik ve güvenirlik çalışması. (Validity and reliability study of the Prenatal Self-Evaluation Questionnaire). *Atatürk Üniversitesi Hemşirelik Yüksekokulu Dergisi* 11(1): 16–24.

Bulut A, Özdemir F (2019) Adaptation to pregnancy and ability to cope with stress of pregnant women diagnosed with hyperemesis gravidarum. *Anadolu Hemşirelik ve Sağlık Bilimleri Dergisi* 22(4): 277–283.

Buysee DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ (1989) The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Research* 28(2): 193–213.

Çelik F, Köse M (2017) Gebelikte uyku kalitesinin trimester ile ilişkisi. (The relationship between sleep quality and trimester of pregnancy). *Kocatepe Tıp Dergisi* 18(3): 85–88.

Çoban A, Yanıkkerem U (2010) Gebelerde uyku kalitesi ve yorgunluk düzeyi. (Sleep quality and fatigue in pregnant women). *Ege Tıp Dergisi* 49(2): 87–94.

Demirbas H, Kadıoğlu H (2014) Prenatal dönemdeki kadınların gebeliğe uyumu ve ilişkili faktörler. (Adaptation to pregnancy in prenatal period women and factors associated with adaptation). *Marmara Üniversitesi Sağlık Bilimleri Enstitüsü Dergisi* 4(4): 200–206.

Gao M, Hu J, Yang L, Ding N, Wei X, Li L, et al. (2019) Association of sleep quality during pregnancy with stress and depression: A prospective birth cohort study in China. *BMC Pregnancy and Childbirth* 19(444): 1–8.

Hutchison BL, Stone PR, McCowan LM, Stewart AW, Thompson JMD (2012) A postal survey of maternal sleep in late pregnancy. *BMC Pregnancy and Childbirth* 12(144): 1–7.

İşbir GG (2011) *Roy Adaptasyon Modeline Dayalı Danışmanlığın Gebelikte Bulantı Kusmaya Etkisi*. (The effect of counseling based on the roy adaptation model on nausea and vomiting in pregnancy). Doktoraz Tezi. İzmir: Dokuz Eylül Üniversitesi Sağlık Bilimleri Enstitüsü.

Kiehl EM, White MA (2003) Maternal adaptation during childbearing in Norway, Sweden and the United States. *Scandinavian Journal of Caring Sciences* 17(2): 96–103.

Ko SH, Chang SC, Chen CH (2010) A comparative study of sleep quality between pregnant and non-pregnant Taiwanese women. *Journal of Nursing Scholarship* 42(1): 23–30.

Kostanoğlu A, Manzak A, Şahin A (2019) Gebelerde fiziksel aktivite seviyesi ve uyku kalitesinin yaşam kalitesine etkisi. (The effect of physical activity level and sleep quality on quality of life in pregnant women). *Journal of Turkish Sleep Medicine* 6(3): 80–87.

Köybaşı EŞ, Oskay ÜY (2017) Gebelik Sürecinin Uyku Kalitesine Etkisi. (Effects of pregnancy process on the quality of sleep). *Gülhane Tıp Dergisi* 59(1): 1–5.

Lederman RP, Wels K (2009) Psychosocial adaptation to pregnancy: seven dimensions of maternal role development. In R Lederman, K Wels (eds.), *Psychosocial Adaptation to Pregnancy*, 1–38. New York: Springer.

Lederman RP, Lederman E, Work Jr BA, McCann DS (1979) Relationship of psychological factors in pregnancy to progress in labor. *Nursing Research* 28(2): 2 94–97.

Özçalkap N (2018) *Adıyaman İl Merkezindeki Gebelerin Gebelik ve Anneliğe Uyumlarının Karşılaştırılması*. (Comparıson of adaptation to pregnancy and motherhood of pregnants in Adıyaman city center). Gaziantep: Hasan Kalyoncu Üniversitesi Sağlık Bilimleri Enstitüsü Yüksek Lisans Tezi.

Özhüner Y, Çelik N (2019) Gebelerde Uyku Kalitesi ve Yaşam Kalitesi. (Sleep quality and quality of life in pregnants). *Sağlık Bilimleri ve Meslekleri Dergis* 6(1): 25–33.

Özorhan EY, Ejder AS, Şahin AÖ (2014) Gebelikte Ruh Sağlığı. (Mental health in pregnancy). *Yıldırım Beyazıt Üniversitesi Sağlık Bilimleri Fakültesi Hemşirelik E-Dergisi* 2(3): 33–42.

Öztürk MD, Yılmaz A, Müsüroğlu S, Sevinç S, Akcan B (2019) Son trimesterdeki gebelerin uyku kalitelerinin ve uyku problemlerine karşı başetme yöntemlerinin belirlenmesi. (Determination of sleep quality of sleeping pregnancies in last trimester and methods of coping: sleep in last trimester pregnancy). *SDÜ Sağlık Bilimleri Dergisi* 10(3): 212–216.

Pınar ŞE, Arslan Ş, Polat K, Çiftçi D, Cesur B, Dağlar G (2014) Gebelerde uyku kalitesi ile algılanan stres arasındaki ilişkinin incelenmesi. (Examining the association of perceived stress with sleep quality in pregnancy). *Dokuz Eylül Üniversitesi Hemşirelik Yüksekokulu Elektronik Dergisi* 7(3): 171–177.

Rezaei E, Moghadam ZB, Saraylu K (2013) Quality of life in pregnant women with sleep disorder. *Journal of Family & Reproductive Health* 7(2): 87–93.

Salbacak B (2021) *Gebelik Stresinin Uyku Kalitesine Etkisi*. (The effect of pregnancy stress on sleepy quality). Ordu: TC Ordu Üniversitesi Sağlık Bilimleri Enstitüsü Yüksek Lisans Tezi.

Sarınç US, Ünlü M (2014) Gebelikte uyku sorunları. (Sleep problems during pregnancy). *Güncel Göğüs Hastalıkları Serisi* 2(2): 238–242.

Sharma S, Franco R (2004) Sleep and its disorders in pregnancy. *Wisconsin Medical Journa*l 103(5): 48–52.

Sedov ID, Cameron EE, Madigan S, Tomfohr M, Lianne M (2018) Sleep quality during pregnancy: a meta-analysis. *Sleep Medicine Reviews* 38(Apr): 168–176.

Şenol V, Soyuer F, Akça RP, Argün M (2012) Adolesanlarda uyku kalitesi ve etkileyen faktörler. (The sleep quality in adolescents and the factors that affect it). *Kocatepe Tıp Dergisi* 13(2): 93–102.

Taşkıran N (2011) Gebelik ve uyku kalitesi. (Pregnancy and sleep quality). *Journal of Turkish Society of Obstetrics and Gyne*cology 8(3): 181–187.

Yeral İ (2019) Gebelikte uyku kalitesinin değerlendirilmesi. (Evaluatıon of sleep quality ın pregnancy). *Ankara Eğtim Araştırma Hastanesi Dergisi* 52(1): 34–37.

Yeşilkaya H (2018) Gebe Kadınların Uyku Sorunları ve Sağlıklı Yaşam Biçimi Davranışlarının Belirlenmesi. (Determination of sleep problems and healthy lifestyle behaviours of pregnant women). Sivas: Yüksek Lisans Tezi, Cumhuriyet Üniversitesi Sağlık Bilimleri Enstitüsü.

Yurtsal ZB, Eroğlu V (2019) Gebe kadınların gebelikte yoganın faydaları hakkındaki bilgi ve görüşleri. (Knowledge and opinions of pregnant women about the benefits of yoga in pregnancy). *Uludağ Üniversitesi Tıp Fakültesi Dergisi* 45(3): 299–304.