THE RELATIONSHIP BETWEEN SLEEP QUALITY, INSOMNIA SEVERITY, AND HEALTHY LIFESTYLE BEHAVIOURS IN PREGNANT WOMEN

Hatice YEŞİLKAYA[1], Zehra GÖLBAŞI[2]

[1]Sivas Cumhuriyet Üniversitesi, Araştırma ve Uygulama Hastanesi, Sivas, Türkiye

[2]Lokman Hekim Üniversitesi, Sağlık Bilimleri Fakültesi, Hemşirelik Bölümü, Ankara, Türkiye

0000-0002-3208-2341 0000-0002-0410-7433

ABSTRACT

This study aims to determine the relationship between sleep quality, insomnia severity, and healthy lifestyle behaviors among pregnant women. The research was conducted with 349 pregnant women who visited a university hospital for pregnancy controls. Data were collected using a Pregnant Information Form, Pittsburgh Sleep Quality Index (PSQI), Insomnia Severity Index (ISI), and Healthy Lifestyle Behavior Scale-II (HLBES-II). The average PSQI score of the pregnant women was 7.16±3.96, indicating that 59.0% of the participants had poor sleep quality. Among those in their first trimester, 51.7% reported poor sleep quality. According to ISI results, 48.4% of the pregnant women experienced varying degrees of insomnia. The average total score on HLBES-II was calculated as 124.95±20.13. It was found that scores on the stress management sub-dimension were lower in women with poor sleep quality (17.97±4.17) compared to those with good sleep quality (19.25±4.31). A significant negative correlation was observed between HLBES-II scores and both ISI and PSQI scores ($p<0.05$). Findings from this study reveal that nearly half of pregnant women experience insomnia issues, and more than half have poor sleep quality. Furthermore, it has been observed that an increase in healthy lifestyle behaviors is associated with improved sleep quality and reduced insomnia severity among these women.

Keywords: Pregnancy, Sleep Quality, Insomnia, Healthy lifestyle behaviors.

GEBE KADINLARDA UYKU KALİTESİ, UYKUSUZLUK ŞİDDETİ VE SAĞLIKLI YAŞAM BİÇİMİ DAVRANIŞLARI ARASINDAKİ İLİŞKİ

ÖZ

Bu araştırma gebe kadınlarda uyku kalitesi, uykusuzluk şiddeti ve sağlıklı yaşam biçimi davranışları arasındaki ilişkiyi belirlemek amacıyla yapılmıştır. Araştırma bir üniversite hastanesine gebelik kontrolleri için başvuran 349 gebe ile yürütülmüştür. Veriler Gebe Bilgi Formu, Pittsburgh Uyku Kalitesi İndeksi (PUKİ), Uykusuzluk Şiddeti İndeksi (UŞİ) ve Sağlıklı Yaşam Biçimi Davranışları Ölçeği II (SYBDÖ II) ile toplanmıştır. Gebe kadınların toplam PUKİ puanı 7,16±3,96 olup, %59'unun uyku kalitesinin kötü olduğu bulunmuştur. UŞİ sonuçlarına göre gebelerin %48,4'ünün klinik olarak önemli düzeyde uykusuzluk yaşadığı belirlenmiştir. Gebelerin SYBDÖ II toplam puan ortalaması 124,95±20,13 olarak belirlenmiştir. Stres yönetimi alt boyut puan ortalamasının uyku kalitesi kötü olan kadınlarda (17,97±4,17), uyku kalitesi iyi olan kadınlardan (19,25±4,31) düşük olduğu saptanmıştır. SYBDÖ II ile hem UŞİ hem de PUKİ toplam puan ortalaması arasında negatif yönde anlamlı bir ilişki bulunmuştur ($p<0,05$). Bu araştırmadan elde edilen sonuçlar, gebelerin yarıya yakınında uykusuzluk sorunu olduğu ve yarısından fazlasının uyku kalitesinin kötü olduğunu göstermiştir. Gebelerin sağlıklı yaşam biçimi davranış düzeyi yükseldikçe uyku kalitesi yükselmekte, uykusuzluk şiddeti ise azalmaktadır.

Anahtar kelimeler: Gebelik, Uyku kalitesi, Uykusuzluk, Sağlıklı yaşam biçimi davranışları.

İletişim/Correspondence
Zehra GÖLBAŞI
Lokman Hekim Üniversitesi,
Sağlık Bilimleri Fakültesi, Hemşirelik Bölümü, Ankara, Türkiye

E-posta: zehragolbasi@gmail.com
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INTRODUCTION

Sleep disturbances are prevalent in pregnacy. Many pregnant women report significant sleep alterations such as decrease in mean sleep duration, an increase in sleep disturbances, and longer time to fall asleep, and poor sleep quality due to physiological, hormonal, psychological and mechanical change (1-4). In a systematic review and meta-analysis by Mislu et al (5), poor sleep quality was identified as 37.46% in the first trimester, 47.62% in the second trimester, and 60.05% in the third trimester.

Sleep disturbances are associated with significant maternal/fetal complications, but they are often overlooked. A systematic review found evidence that low sleep quality related to low maternal health-related quality during pregnancy (6). After conducting an extensive meta-analysis of 23 studies, Abbasi et al. have determined that sleep disorders including poor sleep quality significantly increase the risk of developing preeclampsia (7). Poor sleep during pregnancy is associated with increased odds of preterm birth, cesarean section, hypertension, gestational diabetes, and longer deliveries (8).

Preventing health problems during pregnancy, including sleep problems, and improving and maintaining the health of pregnant women are important for their quality of life. Therefore, every pregnant woman should adopt health-promoting lifestyle behaviors. Also, it is important to adopt healthy lifestyle behaviours during pregnancy in order to improve sleep quality and to prevent sleep problems. There is a significant link between Healthy Lifestyle Behaviours (HLBs) and good health. HLBs include self-actualisation, adequate and regular exercise, balanced nutrition, interpersonal relationships, health responsibility and stress management (9). HLBs are even more important during pregnancy, a very special period in a woman's life. This is because a healthy pregnancy will form a solid foundation for both the mother’s health and the health of the foetus. Studies evaluating HLBs in pregnant women generally show that HLBs scale scores are not at the desired level. In one study, HLBs was examined in primiparous and multiparous pregnant women, and the mean total HLBs scores were found to be 138.58±16.72 in primiparous pregnant women and 123.51±19.04 in multiparous pregnant women (10). In another study, HLBs was compared between normal and high-risk pregnancies. The mean total scale score was 117.27±24.24 in normal pregnancies and 123.62±25.44 in high-risk pregnancies (11). Considering that the maximum score that can be obtained from the scale is 208, it can be stated that these scores are not at the desired level. Minimising pregnancy-related discomfort will not only help ensure a healthier pregnancy but also reduce sleep problems associated with such discomfort. In this context, it is extremely important to identify the sleep problems experienced by pregnant women and their HLBs and to develop solutions to these problems. This study was conducted to determine the sleep quality, severity of insomnia, and HLBs of pregnant women and sought answers to the following questions.

- What is the level of sleep quality and prevalence of insomnia in pregnant women?

- What is the level of HLBs among pregnant women?

- Is there a relationship between insomnia, sleep quality and the level of HLBs during pregnancy?

MATERIAL AND METHOD

Research Population and Sample

The study was conducted at Sivas Cumhuriyet University Hospital antenatal clinic between 17 March 2017 and 30 June 2017 as a descriptive study. The population of the study consisted of women who visited the clinic for antenatal care. In 2016, an average of 168 pregnant women visited the antenatal clinic each month, with a total of 3,728 visits for the year. The number of pregnant women to be included in the sample was calculated using a formula (n=N.t2pq/d2(N-1)+t2pq) used in studies examining the frequency of events in cases where the population is known (N=3728, p=0.50, q=0.50, d=0.05, t=1.96) and found to be 349 (12). The sample of the determined number was selected from among pregnant women who visited the hospital's obstetrics clinic, were between 8 and 40 weeks pregnant, and agreed to participate in the study. Written consent was obtained from the pregnant women who agreed to participate in the study, and these women were included in the study.

Data Collection

Prior to the commencement of the study, approval was obtained from the Non-Interventional Clinical Research Ethics Committee of a university (Decision No: 2017-01-20). In addition, institutional approval was obtained from the hospital where the study was conducted. Furthermore, the completed questionnaires were anonymous, and participants were asked not to include personal information such as their full names. The study was conducted in accordance with the principles of the Helsinki Declaration. The data for the study were collected using the Pregnant Information Form which were prepared by the researchers, Insomnia Severity Index, Pittsburgh Sleep Quality Index, and Healthy Lifestyle Behaviours Scale II,.

Pregnant Information Form: This form was prepared by the researchers and consists of 29 questions covering the socio-demographic characteristics of pregnant women as well as their previous and current obstetric histories. The first eight questions concern the socio-demographic characteristics of pregnant women. Questions 9-19 on the form concern the marital, obstetric, and health histories of pregnant women, while questions 20-29 concern the history of the current pregnancy.

Pittsburgh Sleep Quality Index (PSQI): The index was developed by Buysse and colleagues, and its internal consistency was found to be 0.83. The index is a measure that provides information about sleep quality and the type and severity of sleep disorders over the past month. The scale consists of a total of 24 questions. Questions answered by the individual are included in the evaluation, while questions answered by the bed partner are not included. The index consists of a total score and seven subscales (subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disorder, sleep medication use, and daytime dysfunction). Each item on the scale is scored between 0 (no distress) and 3 (severe distress). The sum of the scores for the seven subdimensions gives the total PSQI score. Each subdimension score ranges from 0 to 3. The total PSQI score ranges from 0 to 21. A total score of ≤5 or below indicates ‘good’ sleep quality’, while >5 indicates ‘poor sleep quality’ (13). In

Turkey, Ağargün and colleagues (1996) found the internal consistency coefficient to be 0.80. (14).

Insomnia Severity Index: The Insomnia Severity Index (ISI) was published in 1993 by Morin, but the first psychometric assessment was published in 2001 by Bastien and et al. The seven items of the scale are scored on a scale of 0-4. ISI scores range from 0 to 28, with higher scores indicating more severe insomnia symptoms. Scores between 0 and 7 on the index are interpreted as clinically insignificant insomnia, scores between 8 and 14 as subthreshold insomnia, scores between 15 and 21 as clinical insomnia (moderate severity), and scores between 22 and 28 as clinical insomnia (severe) (15). Boysan and colleagues (2010), who adapted the scale into Turkish, found the internal consistency coefficient to be 0.79 and reported that the scale has sufficient validity and reliability for use by researchers in the Turkish sample. (16).

Healthy Lifestyle Behaviour Scale-II: The Healthy Lifestyle Behaviour Scale-II (HLBES-II) was developed by Walker and colleagues in 1987. The scale measures an individual's health-promoting behaviours related to a healthy lifestyle. The scale consists of a total of 52 items and has 6 subscales. The sub-factors are, in order: health responsibility, physical activity, nutrition, mental development, interpersonal relationships, and stress management. All items in the scale are positive. The rating is on a four-point Likert scale: never (1), sometimes (2), often (3), regularly (4). The lowest possible score for the entire scale is 52, and the highest possible score is 208. The total score of the scale reflects the individual's healthy lifestyle behaviour score. A higher total score indicates that individuals have better levels of healthy lifestyle behavior (17). The adaptation of the scale to Turkish society and its psychometric analysis were conducted by Bahar and colleagues. They found the reliability coefficient of the scale to be 0.92, indicating a high degree of reliability (18).

Statistical Analysis

The data were analysed using SPSS 20.0 software. Data obtained from counts were presented as frequency distributions, while data obtained from measurements were presented as means and standard deviations. The normality of the distribution of the data obtained from measurements was tested using the Kolmogorov-Smirnov test. The chi-square test was used to compare sleep quality according to the individual and obstetric characteristics of pregnant women. When comparing the mean HLBES-II scores of pregnant women with good and poor sleep quality, the independent sample t-test was used when the conditions for normal distribution were met in two groups, and the Mann-Whitney U test was used when they were not met. Spearman correlation analysis was performed to examine the relationship between ISI, PSQI, HLBES-II mean scores. A correlation coefficient between 0.10 and 0.29 was considered to be low, between 0.30 and 0.49 was considered to be medium, and above 0.50 was considered to be high (19). The significance level was set at $p<0.05$.

RESULTS

The distribution of pregnant women's total PSQI scores and subscale scores according to sleep quality and insomnia severity is shown in Table 1. According to the table, the scores obtained by pregnant women on

the total PSQI score was found to be 7.16±3.96. Bsed on the cut-off point of the scale (PSQI>5), it was determined that 59.0% of pregnant women had poor sleep quality. According to the results of the insomnia severity index, it was found that 16.9% of pregnant women experienced clinical insomnia.

Table 2 shows the mean scores of pregnant women on the HLBES-II. The mean HLBES-II scores were as follows: 21.21±4.61 for health responsibility, 11.56±3.92 for physical activity, 21.18±4.21 for nutrition, 26.64±4.43 for spiritual development, 25.85±4.92 for interpersonal relationships, and 18.50±4.27 for stress management. The total HLBES-II score was determined to be 124.95±20.13.

Table 3 compares some characteristics of pregnant women with poor and good sleep quality. It was determined that 51.7% of pregnant women in the first trimester, 44.5% of women in the second trimester, and 73.9% of those in the third trimester had poor sleep quality, and the difference between the groups was statistically significant ($p<0.001$). It was found that 75.3% of women who had experienced sleep problems in their previous pregnancies had poor sleep quality, while 50.6% of those who had not experienced sleep problems had poor sleep quality ($p<0.001$).

Table 4 shows the comparison of the HLBES-II total and subscale mean scores between pregnant women with good and poor sleep quality. The mean subscale score for stress management in pregnant women with good sleep quality (19.25±4.31) was found to be statistically significantly higher than that of pregnant women with poor sleep quality (17.97±4.17) ($p<0.05$). No statistically significant difference was found between pregnant women with good and poor sleep quality in terms of other subscale scores and HLBES-II total scores ($p>0.05$).

Table 5 shows the correlation results between women's ISI and PSQI scores and their HLBES-II total and subscale mean scores. According to the table, there was a statistically significant weak negative relationship between the total HLBES-II score and the average subscale scores for health responsibility, nutrition, spiritual development, and stress management among pregnant women, and the average total ISI score ($p<0.05$). No significant relationship was found between ISI and the subscale mean scores of HLBES-II for physical activity and interpersonal relationships ($p>0.05$). Additionally, statistically significant negative relationship was found between the total score of HLBES-II and the subscale mean scores of health responsibility, spiritual development, and stress management subscale scores, and the PSQI total score average showed a statistically significant weak negative correlation ($p<0.05$); no significant correlation was found between the PSQI total score and the physical activity, nutrition, and interpersonal relationships subscale scores ($p>0.05$).

Table 1. Distribution of sleep quality and insomnia severity with total and subscale mean scores of PSQI in pregnant women

PSQI sub-dimensions	**Mean**	**SD**	**Min.**	**Max.**
Subjective sleep quality	1,25	0,81	,00	3,00
Sleep latency	1,33	0,98	,00	3,00
Duration of sleep	0,68	1,03	,00	3,00
Habitual sleep efficiency	1,10	1,22	,00	3,00
Sleep disturbance	1,90	0,65	,00	3,00
Use of sleeping medication	0,00	0,00	,00	,00
Daytime dysfunction	0,86	0,93	,00	3,00
Total PSQI	**7,16**	**3,96**	**,00**	**18,00**
			n	**%**
Sleep quality				
Good sleep quality (PSQI≤5)			143	41,0
Poor sleep quality (PSQI>5)			206	59,0
Insomnia severity				
No clinically significant insomnia			180	51,6
Subthreshold insomnia			110	31,5
Clinical insomnia (moderate severity)			45	12,9
Clinical insomnia (severe)			14	4,0

SD: Standart Deviation

Table 2. Average scores on the HLBES-II for pregnant women

HLBES-II				
Sub-dimensions	**Mean**	**SD**	**Min.**	**Max**
Health Responsibility	21,21	4,61	10,00	33,00
Physical Activity	11,56	3,92	8,00	28,00
Nutrition	21,18	4,21	11,00	33,00
Spiritual Development	26,64	4,43	12,00	36,00
Interpersonal Relationships	25,85	4,92	11,00	36,00
Stress Management	18,50	4,27	8,00	31,00
Topal HLBES-II	124,95	20,13	64,00	183,00

SD: Standart Deviation

Table 3. Comparison of some characteristics of pregnant women with good and poor sleep quality

Variables	Sleep quality				Statistical test*	
	Good sleep quality (PSQI ≤5) (n=143)		Poor sleep quality (PSQI >5) (n=206)			
	n	%	n	%	x^2	p
Age Group						
17-29	77	37,4	129	62,6	3,129	0,209
30-35	42	44,2	53	55,8		
35 and over	24	50,0	24	50,0		
Family						
Extended family	35	51,5	33	48,5	3,847	0,050
Nuclear family	108	38,4	173	61,6		
Employement						
Yes	23	42,6	31	57,4	0,069	0,793
No	120	40,7	175	59,3		
Income						
Income is less than expenses	48	37,2	81	62,8	1,428	0,490
Income equals expenses	84	42,6	113	57,4		
Income is more than expenses	11	47,8	12	52,2		
Education						
Primary school and below	44	49,4	45	50,6	4,416	0,220
Middle school	28	34,1	54	65,9		
High school	35	41,2	50	58,8		
University	36	38,7	57	61,3		
Trimester						
First	14	48,3	15	51,7	**29,306**	**0,000**
Second	86	55,5	69	44,5		
Third	43	26,1	122	73,9		
Planned pregnancy						
Yes	102	41,2	146	58,9	0,008	0,927
No	41	40,6	60	59,4		
Gravida						
Primigravida	48	40,7	70	59,3	0,006	0,936
Multigravida	95	41,1	136	58,9		
Sleep problems in previous pregnancies						
Yes	19	24,7	58	75,3	**12,900**	**0,000**
No	76	49,4	78	50,6		

** Chi-square test*

Table 4. Comparison of HLBES-II total and subscale mean scores between pregnant women with good and poor sleep quality

HLBES-II Sub-dimensions and Total Score	Sleep Quality				Statistical Test	
	Good sleep quality (PSQI ≤5) (n=143)		Poor sleep quality (PSQI >5) (n=206)			
	Mean	SD	Mean	SD		
Health Responsibility	21.55	4,26	20,97	4.84	*z =-1,35	p= 0,175
Physical Activity	11,53	3,67	11,58	4,08	*z=-0,23	p= 0,514
Nutrition	21,36	4,27	21,05	4,18	*z=0,66	p= 0,507
Spiritual Development	25,78	5,05	25,90	4,85	**t=0,81	p= 0,415
Interpersonal Relationships	26,04	4,83	25,77	4,97	*z=-0,23	p=0,817
Stress Management	19,25	4,31	17,97	4,17	***z=2,78**	**p= 0,006**
HLBES Total Score	126,37	20,25	123,98	20,04	**t=1,09	p= 0,275

*SD: Standart Deviation; *Mann-Whitney U test; ** Independent sample t-test*

Table 5. Correlation results between women's ISI and PSQI and HLBES-II total and subscale mean scores

	HLBES-II Total Score	Health Responsibility	Physical Activity	Nutrition	Spiritual Development	Interpersonal Relationships	Stress Management
				r* / p			
ISI	-,194/**0,000**	-,180/ **0,001**	-,029/0,584	-,135/**0,012**	-,181/**0,001**	-,098/0,067	-,269/**0,000**
PSQI	-,146/**0,006**	-,132/**0,013**	-,086/0,107	-,068/0,203	-,110/**0,041**	-,014/0,793	-,268/**0,000**

* *Spearman correlation analysis*

DISCUSSIONS

The study found that 59.0% of pregnant women had poor sleep quality and, according to the insomnia severity index results, 16.9% experienced clinical insomnia (moderate and severe). In their studies, Mindell and colleagues found that 76% of pregnant women, Yang and colleagues found that 87% of pregnant women, Çoban and Yanıkerem found that 54% of pregnant women, and Çelikgöz found that 68% of pregnant women had poor sleep quality (20-23). In a meta-analysis conducted by Sedov and colleagues, 45.7% of pregnant women were found to have poor sleep quality (24). The results obtained from the study are similar to some studies (22,23), but lower than the results of some other studies (20,21). This may be related to differences in the sample characteristics and measurement methods of the studies. On the other hand, it can be said that poor sleep quality is common among pregnant women and must be evaluated as part of prenatal care services. The study found that approximately half (48.4%) of pregnant women experienced insomnia to varying degrees (threshold, moderate and severe). In a study evaluating insomnia during pregnancy, the prevalence of insomnia among 486 pregnant women was found to be 52.2% (25). In other study it was stated that more than half (57%) of pregnant women experienced insomnia (20). These results support the findings of our study and indicate that insomnia is a common problem among pregnant women.

The total HLBES-II score for pregnant women was determined to be 124.95±20.13. Some of the study results are similar to those of our study. In the studies by Saydam and colleagues (26) on high-risk pregnancies, the HLBES-II total score was 121.31±21.02, in the study by Onat and Aba (27) it was 130.7±20.0, and in the studies by Kırca and colleagues (28) it was 124.48±19.26. Differences in the study results may be related to the characteristics of the sample group, risk status during pregnancy, and gestational age. In studies, the lowest subscale score average was in the physical activity factor (26-28). These results indicate that the physical activity sub-dimension is a neglected dimension. It is considered important to increase health awareness, promote and sustain positive health behaviours, prepare adequate facilities and environments for physical activity, and encourage pregnant women to engage in these activities in order to improve health.

Our study found that pregnant women in the first and last trimesters had poorer sleep quality than those in the second trimester. These results suggest that physiological discomfort experienced in the first trimester (e.g., nausea, vomiting, frequent urination, etc.) negatively affects sleep quality, while in the third trimester, increased mechanical

load, respiratory distress, leg cramps, and frequent urination may contribute to poor sleep quality. In the third trimester, sleep problems may occur due to back pain caused by an enlarged abdominal circumference, sudden foetal movements, heartburn, and nocturia. Some studies have also found that the frequency of poor sleep quality in pregnant women in the third trimester is higher than in other trimesters (31-33). In a study by Li and colleagues involving Chinese pregnant women between 13 and 28 weeks of pregnancy, 38.8% of pregnant women were found to have poor sleep quality (34). In Güdücü and colleagues' study, it was determined that 30.8% of women in their first trimester, 37.5% of women in their second trimester, and 31.7% of women in their third trimester had sleep problems (35). These results mostly indicate that women in their first and last trimesters have poor sleep quality. It is important to carefully evaluate sleep problems in pregnant women during this period, especially within the scope of antenatal care. In addition, our study found a significant difference in sleep quality between pregnant women with and without sleep problems in previous pregnancies ($p<0.05$). Pregnant women who experienced sleep problems in their previous pregnancies also experience sleep problems in their current pregnancies. In this context, it may be recommended that multigravida women who have experienced sleep problems in previous pregnancies be evaluated effectively in terms of sleep quality. The different research results regarding the frequency of poor sleep quality during pregnancy may be due to differences in the characteristics of the sample group in which the studies were conducted, the health status during pregnancy, and the week of gestation.

Pregnant women with good sleep quality had higher stress management scores than those with poor sleep quality. The results of the study by Pınar Ertekin and colleagues also support our study and indicate that as the perceived stress level of pregnant women increases, their sleep quality deteriorates (36). When pregnancy is considered a developmental stressor, it is important to be able to cope effectively with this event and adapt to the changes experienced. In this regard, it can be said that developing stress management skills in pregnant women will also improve sleep quality.

Existing literature demonstrates a relationship between healthy lifestyle behaviors, such as nutrition, physical exercise, and stress management, and sleep quality (37-39). While sleep quality in pregnant women is a frequently studied topic, there are insufficient studies examining its relationship with healthy lifestyle behaviors. A few studies address the relationship between perceived stress during pregnancy and sleep quality (36,40). In our study, we found significant relationships between pregnant women's HLBs and their average ISI and PSQI scores. These results show that as the level of healthy lifestyle behaviours among pregnant women increases, both sleep problems decrease and sleep quality improves. In particular, health-promoting behaviours such as coping with stress, nutrition, spiritual development, and health responsibility are related to the sleep function of pregnant women. In this context, it can be said that increasing and developing the healthy lifestyle behaviour levels of pregnant women is an important factor in reducing and/or eliminating sleep-related problems.

CONCLUSIONS AND RECOMMENDATIONS

The results of the study showed that nearly half of pregnant women had insomnia and more than half had poor sleep quality. It was found that sleep quality was poorer in the first and third trimesters and better in the second trimester. It was found that the level of healthy lifestyle behaviours among women during pregnancy was moderate. When the distribution of the sub-dimensions of the scale was examined in relation to sleep quality, a significant relationship was found between the stress management sub-group and sleep quality. Pregnant women with high stress management scores had better sleep quality, while those with lower stress management scores had poorer sleep quality. Based on these results, it is recommended that programmes aimed at improving healthy lifestyle behaviours among pregnant women be included in antenatal care services, that all pregnant women be assessed for sleep problems and healthy lifestyle behaviours, and that appropriate interventions be planned for pregnant women with identified issues.

LIMITATIONS

This study has some limitations. First, the study included data from pregnant women who applied to the hospital for pregnancy check-ups, so the results cannot be generalized to the whole population. In addition, insomnia severity and sleep quality were obtained through self-reported questionnaires and are based on the perception of the woman. Because conditions that affect sleep quality, such as preexisting sleep problems, chronic illnesses, and psychiatric disorders, were not used as exclusion criteria, the presence of these conditions may have influenced the results. The study results should be interpreted accordingly. Additionally, the causality between sleep quality and healthy lifestyle behaviors should be interpreted in line with the limitations of cross-sectional studies.

RESEARCH CONTRIBUTION DECLARATION

Study design: ZG, HY; literature search: HY, ZG; Data collection: HY, ZG, Data analysis: ZG, HY, Manuscript writing: HY, ZG; Critical reading; ZG, HY, Final approval; HY, ZG.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

ETHICAL APPROVAL

Ethics approval was obtained from Sivas Cumhuriyet University Non-Interventional Clinical Research Ethics Committee (Decision number: 2017-01/20, Date: 20.01.2017) The study was conducted in agreement with the Declaration of Helsinki, and informed consent was obtained from all patients.

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