Original Article

The Relationship Between Fatigue and Sleep Quality of Women in the Postpartum Period

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Abstract
Purpose: In this study, it was aimed to examine the relationship between postpartum fatigue and sleep quality of women.
Methods: This was a descriptive and crosssectional study This study was conducted in a public hospital in the south of Turkey between April and June 2021. 272 women were included in the study. The personal information form, the Visual Similarity Scale for Fatigue and the Pittsburgh Sleep Quality Index were used to collect data. Data were analysed using Mann Whitney-U test, Kruskal-Wallis H t test and Interquartile Range tests analyses. The relationships between the scales were evaluated with the Spearman correlation analysis.
Findings: A total of 272 responders answered the survey. The mean age of the women who participated in the study was 31.30±5.40. The total PSQI mean score of women who participated in the study was 15.39±5.82, the mean score of the fatigue sub-dimension was 98.40±30.76, and the mean score of the energy sub-dimension was 18.88±13.72.
Conclusions: It was determined that the fatigue level of women was high while their sleep quality was poor in the postpartum period. Our study showed that women's sleep quality deteriorated as their fatigue scores increased.
Implications for nursing practice: Nurses should carefully monitor the sleep of mothers when they are together with their infants. Mothers should be provided with help when they are tired so that they can sleep more comfortably. It is important to understand the subjectivity and multidimensionality of fatigue and to constantly evaluate sleep.

Keywords: Fatigue, Postpartum Period, Sleep Quality, Women

Introduction

The postpartum period is generally defined as the first 12 months after delivery. Postpartum sleep and fatigue are two of the most pressing and persistent issues mothers struggle with daily in the months after childbirth. Postpartum fatigue, conceptualized as having both physical and mental dimensions (Parks et al., 1999), is highest in the days after giving birth and tends to follow one of two trajectories; either improving quickly over the first postpartum weeks or remaining high for several months (Doering Runquistet al., 2009; Gardner, 1991; Rychnovsky & Beck, 2006; Troy, 1999).

In many studies conducted in recent years, fatigue has been indicated to be one of the most common problems in women in the postpartum period (Thomas & Spieker, 2016; Varcho et al., 2012; Dunning et al., 2013; Lai et al., 2015). In these studies, it has been reported that fatigue is a problem that must be addressed in the postpartum period (Dunning et al., 2013; Giallo et al., 2015). In the study conducted by Woolhouse et al. (2014), it was determined that the most frequently mentioned problem by women in the first 3 months of postpartum was fatigue by 67%, followed by back pain by 47%, breast problems by 37% and a painful perineum by

30%. In another study, it was reported that while the great majority of postpartum primigravida women (81%) had fatigue, 50% of them had sleep disorders, 16.5% of them had mastalgia and breast pain, and 5.1% of them had dyspareunia (Çubukçu & Varol, 2009). In this period, women cannot find an appropriate and effective solution to fatigue, which is an almost universal problem.

One of the common problems that mostly affect women after childbirth is sleep problems (Tsuchiya et al., 2016). In a nationwide study in Japan, it was indicated that the most important problem of 66% of puerperant women in the first month of postpartum was sleep problems (Shimada et al., 2006). Postpartum women sleep an average of 7 hr each night; however,sleep efficiency is lower than in non-postpartum populations due to nocturnal infant caregiving (Filtness et al., 2014; Gay et al., 2004; Montgomery-Downs et al., 2010). Sleep efficiency, or the percentage of time spent asleep relative to the time spent in bed, is lowest shortly after birth and improves slowly over several months as the infant's sleep consolidates and the infant's daytime sleep shifts to nocturnal hours (Filtness et al., 2014; Montgomery-Downs et al., 2010). Sleep patterns of women in the postpartum period are disrupted due to the care needs of their infants. In the studies, it has been determined that insufficient sleep or interrupted sleep of women in the first few days after childbirth leads to fatigue (Rychnovsky & Hunter, 2009; Badr & Zauszniewski, 2017). The health effects of poor subjective sleep and postpartum fatigue on mothers and their families are numerous, including depression, early weaning from breastfeeding, poor functional status, and impaired infant development, and are often overlooked by health care providers (Coo et al., 2014; Dennis & Ross, 2005; Doering Runquist et al., 2009; Goyal et al., 2009; Parks et al., 1999; Rychnovsky & Hunter, 2009; Troy, 2003) Fatigue also affects women's physical, emotional and cognitive functions (Shen Barbera & Shapiro, 2006). Furthermore, it was determined that there was a significant relationship between fatigue, sleep problems and depression observed in the postpartum period (Thomas & Spieker, 2016). The aim of the study was to examine the relationship between postpartum fatigue and sleep quality of women.

Methods

Design of the Study: This was a descriptive and crosssectional study.

Setting and sample: The study was conducted in a public hospital in the south of Turkey between April and June 2021. The purposive sampling method was used in the study. This study was conducted in a public hospital, where an average of 130 deliveries occur per month. 272 women who met the inclusion criteria of the study constituted sample of the study.

Data collection: The data were collected by the researchers between April and June 2021. The data of the study were collected by face-to-face interviews with women using the personal information form, Visual Similarity Scale for Fatigue (VSSF) and the Pittsburgh Sleep Quality Index (PSQI). In accordance with the pandemic measures, the data were collected at a distance of at least 1.5 m, without any physical contact, and by complying with hygiene, distance and mask use. It took approximately 10-15 minutes for each woman to fill out the forms.

Data Collection Tools: A form consisting of three parts was used to collect the research data: The Personal Information, Visual Similarity Scale for Fatigue, and The Pittsburgh Sleep Quality Index.

The Personal Information: The personal information form was prepared by the researchers based on the literature (Thomas & Spieker, 2016; Tsuchiya et al., 2015; Lai et al., 2016). This form includes 20 questions examining women's sociodemographic and obstetric characteristics.

Visual Similarity Scale for Fatigue (VSSF): Visual Similarity Scale for Fatigue, the scale that was adapted to Turkish by Yurtsever and Beduk (2003) was used to measure the fatigue of the women. This scale consists of 18 items; 13 items for fatigue and 5 items for energy. The scale consists of 10-cm horizontal lines that contain positive expressions at one end and negative expressions at the other end. The women marked the point exactly corresponding to their feelings on the scale. Then, the marked point was measured by a ruler to make an objective evaluation. The highest score from the fatigue sub-dimension is 130, while the lowest score is 0. The highest

score from the energy sub-dimension is 50, while the lowest score is 0. Having a high score from the fatigue sub-dimension items and a low score from the energy sub-dimension items shows a high fatigue severity. It was reported that Cronbach's α internal consistency coefficient was 0.90 for the 13-item fatigue sub-dimension and 0.74 for the 5-item fatigue sub-dimension and all the correlations between the scale items were significantly high (Yurtsever & Beduk, 2003). In this study, Cronbach's α internal consistency coefficient was 0.77.

The Pittsburgh Sleep Quality Index (PSQI): PSQI a self-report test that determines the sleep qualities of the subject with 7 sections. These sections are (1) subjective sleep quality; (2) sleep latency; (3) sleep duration; (4) sleep efficiency; (5) sleep disturbance, (6) use of sleep medication, and (7) degree of daytime dysfunction. There are a total of 19 questions with scores that can range from 0 to 21. The global sum of "5" as the boundary of good sleep quality, where a subject with a score over 5 is determined with sleep disorder and vice versa (Buysse et al., 1989). The reliability and validity study of the scale in Turkey was performed by Agargun et al. (1986). The Cronbach's alpha internal consistency coefficient was determined as 0.80 (Agargun et al., 1986). In this study, the Cronbach's alpha reliability coefficient of the PSQI was 0.76.

Ethical consideration: Before starting the study, approval was obtained from the Clinical Research Ethics Committee of Akdeniz University Faculty of Medicine (number: 70904504/311, date: 25/05/2021). Permission was also obtained from the hospital where the study was conducted. Written informed consent was obtained from all the women who accepted to participate in the study. The study was conducted in accordance with the Declaration of Helsinki.

Data analysis: Statistical analyses were conducted using the IBM SPSS Statistics for Windows (IBM SPSS Statistics Base v23). Number of units (n), percentage (%), mean±standard deviation (x±sd), median (M) values were used in descriptive statistics. The internal consistency of the scales was evaluated with the Cronbach's alpha coefficient. Mann Whitney-U test, Kruskal-Wallis H t test and Interquartile Range tests were used. The relationships between the scales were evaluated with the Spearman correlation analysis. The level of statistical significance was $P < 0.05$.

Results

The mean age of the women who participated in the study was 31.30±5.40, the total PSQI mean score was 15.39±5.82, the mean score of the fatigue sub-dimension was 98.40±30.76 and the mean score of the energy sub-dimension was 18.88±13.72 (Table 1).

Among the women who participated in the study, the energy sub-dimension scores of those who were unemployed ($p<0.01$), those who had an extended family ($p<0.05$), those who had no health problems during pregnancy ($p<0.001$) and those who had a support system for household chores ($p<0.01$) were found to be statistically higher. On the other hand, the energy sub-dimension scores of those who lived in their own home after delivery ($p<0.01$) and those who had anemia requiring treatment ($p<0.001$) were found to be statistically lower. When the fatigue sub-dimension was examined, the fatigue sub-dimension scores of those who had health problems during pregnancy ($p<0.01$), those who had a vaginal delivery ($p<0.05$), those who had no support for assistance with household chores ($p<0.05$) and those who had anemia requiring treatment ($p<0.05$) were found to be statistically higher (Table 1).

When the Pittsburgh Sleep Quality Scale scores were examined, it was determined that the sleep quality scores of those who had health problems during pregnancy ($p<0.05$), those who exclusively fed their infants with formula ($p<0.05$), those who used medication after delivery ($p<0.01$) and those who had anemia requiring treatment ($p<0.001$) were statistically higher, and thus, they had poorer sleep quality (Table 1).

Table 1. Some characteristics of the participants and the fatigue scale for these characteristics and their PSQI mean scores (*N*=272)

Characteristics		n (%)	Visual Similarity Scale for Fatigue (VSSF)		Pittsburgh Sleep Quality Index (PSQI)
			M (IQR)		M (IQR)
			Fatigue	Energy	Total
Educational status	Illiterate [a]	1 (2.6)	103.00 (27.00)	23.00 (34.00)	16.00 (3.00)
	Primary school [b]	80 (29.4)	112.00 38.75)	14.00 (27.00)	15.00 (3.75)
	Secondary school [c]	73 (26.6)	112.00 (40.50)	14.00 (22.50)	15.00 (3.00)
	High school [d]	63 (23.2)	109.00 (45.00)	13.00 (16.00)	15.00 (2.00)
	University [e]	49 (18.0)	103.00 (37.50)	18.00 (17.50)	15.00 (3.00)
x^2			3.228	3.401	3.603
p			0.462	0.538	0.578
Employment status	Employed	107 (39.3)	109.00 (31.00)	12.00 (17.00)	15.00 (2.00)
	Unemployed	165 (60.7)	109.00 (45.00)	18.00 (25.00)	15.00 (4.00)
z			-0.622	2.704	0.516
p			0.506	**0.007****	0.606
Family type	Nuclear Family	227 (83.5)	110.00 (36.00)	14.00 (19.00)	15.00 (3.00)
	Extended Family	45 (16.5)	103.00 (42.50)	23.00 (22.50)	15.00 (4.00)
z			-0.566	2.211	-0.418
p			0.565	**0.027**	0.660
Having health problems during pregnancy	Yes	68 (25.0)	115.50 (32.75)	8.00 (18.00)	16.00 (3.00)
	No	204 (75.0)	106.00 (39.50)	17.00 (25.00)	15.00 (3.00)
z			-2.673	3.460	-2.170
p			**0.002****	**0.001*****	**0.030***
Mode of delivery	Vaginal	141 (60.7)	112.00 (40.00)	14.00 (24.50)	15.00 (3.00)
	Cesarean section	131 (48.2)	104.00 (38.00)	14.00 (22.00)	15.00 (4.00)
z			-2.357	1.090	-0.901
p			**0.018***	0.276	0.367
Method of feeding the infant	Exclusively breastfeeding[a]	165 (60.7)	111.00 (37.00)	13.00 (20.50)	15.00 (3.00)
	Breast milk and formula [b]	94 (34.6)	106.50 (36.00)	14.00 (23.50)	15.00 (3.00)
	Exclusively formula [c]	13 (4.8)	85.00 (47.00)	23.00 (19.50)	16.00 (4.50)
x^2			3.185	4.447	-26.128
p			0.203	0.108	**0.029* (c>a,b)**
Place of living after childbirth	Own house [a]	221 (81.3)	110.00 (36.50)	12.00 (18.50)	15.00 (3.00)

	With their own family [b]	16 (5.9)	105.00 (60.75)	23.00 (20.75)	15.00 (3.50)
	With her husband's family [c]	35 (12.8)	102.50 (65.00)	23.00 (18.00)	15.50 (4.00)
x^2			5.059	-3.585	1.374
p			0.168	**0.002**** **(b,c>a)**	0.717
Medication use after childbirth	Yes	75 (27.6)	109.00 (58.00)	12.00 (22.00)	16.00 (3.00)
	No	197 (72.4)	109.00 (36.00)	14.00 (23.50)	15.00 (3.00)
z			-0.204	1.090	-2.498
p			0.901	0.276	**0.002****
Presence of someone who helps with household chores	Yes	134 (49.3)	104.00 (40.25)	19.00 (22.50)	15.00 (3.75)
	No	138 (50.7)	112.50 (38.25)	12.00 (18.50)	15.00 (3.00)
z			2.576	2.672	0.908
p			**0.012***	**0.008****	0.364
Presence of anemia requiring treatment	Yes	38 (14.0)	120.00 (37.00)	5.50 (9.00)	17.00 (3.00)
	No	234 (86.0)	107.00 (36.00)	14.50 (25.00)	15.00 (3.00)
z			-2.587	-4.244	-3.685
p			**0.010***	**0.000*****	**0.000*****
Number of pregnancies (M/IQR)			3.00 (2.00)		
Number of births (M/IQR)			2.00 (2.00)		
Number of living children (M/IQR)			2.00 (1.00)		
Mean age (X±SD)			31.30±5.40		
Fatigue sub-dimension mean(X±SD)			98.40±30.76		
Energy sub-dimension mean.(X±SD)			18.88±13.72		
TotalPSQI mean (X±SD)			15.39±5.82		

Abbreviations: z, Mann Whitney-U test; x^2, Kruskal-Wallis H t test; *M*, Median; *IQR*, InterquartileRange; *p<0.05, **p<0.01, ***p<0.001

Table 2. Participants' fatigue status and Pittsburgh Sleep Quality Index mean scores and the relationship between them (n=272)

Scales	Mean (SD)		1	2	3	4	5	6	7	8	
1. Subjective Sleep Quality	1.70 (0.99)	r	-								
		p	-								
2. Sleep Latency	1.29 (0.88)	r	0.131	-							
		p	**0.030***	-							
3. Sleep Duration	8.22 (5.27)	r	-0.073	0.079	-						
		p	0.282	0.197	-						
4. Habitual Sleep Efficiency	0.69 (0.94)	r	-0.284	0.110	-0.217	-					
		p	**0.000*****	0.069	**0.000*****	-					
5. Sleep Disorder	1.26 (0.59)	r	0.371	0.506	-0.078	0.047	-				
		p	**0.000*****	**0.000*****	**0.200**	0.441	-				
6. Use of Sleep Medication	0.42 (0.78)	r	0.200	0.309	-0.129	0.199	0.304	-			
		p	**0.001*****	**0.000*****	**0.034***	**0.001*****	**0.000*****	-			
7. Daytime Dysfunction	1.79 (1.04)	r	0.795	0.137	-0.206	-0.273	0.356	-0.065	-		
		p	**0.000*****	**0.024**	**0.001*****	**0.000*****	**0.000*****	0.284	-		
8. Total PSQI	15.39 (5.82)	r	0.577	0.580	0.220	0.081	0.584	0.294	-0.284	-	
		p	**0.000*****	**0.000*****	**0.000****	0.183	**0.000*****	**0.000*****	**0.000*****	-	
9. Fatigue Sub-Dimension	98.40 (30.76)	r	0.471	0.079	-0.097	-0.216	0.096	-0.116	0.544	0.271	
		p	**0.000*****	0.193	0.112	**0.000*****	0.113	0.069	**0.000*****	**0.000*****	
10. Energy Sub-Dimension	18.88 (13.72)	r	-0.533	-0.76	-0.052	0.250	-0.023	0.319	-0.563	-0.214	-0
		p	**0.000*****	0.213	0.394	**0.000*****	0.701	**0.000*****	**0.000*****	**0.000*****	**0.0**

Abbreviations: *SD*, Standard Deviation; *r*, Spearman Correlation Coefficient; *p<0.05, **p<0.01, ***p<0.001

In the study, it was determined that there was a positive relationship between the fatigue sub-dimension and subjective sleep quality and daytime dysfunction sub-dimensions and the total PSQI score and a negative relationship between the habitual sleep efficiency sub-dimension (p<0.001). These results indicated that the sleep quality of women who participated in the study deteriorated as their fatigue scores increased. While a positive relationship was found between the energy sub-dimension and habitual sleep efficiency and the use of sleep medication sub-dimensions, a negative relationship was found between subjective sleep quality and daytime dysfunction sub-dimensions and the total PSQI score (p<0.001). These results indicated that the sleep quality of women who participated in

the study deteriorated as their energy scores decreased (Table 2).

Discussion

This study investigated the relationship between fatigue and sleep quality of women in the postpartum period. The results obtained in this stage of the study were discussed under the following titles.

- ✓ *Women's Fatigue Levels in the Postpartum Period*
- ✓ *Women's Sleep Quality in the Postpartum Period*

Women's Fatigue Levels in the Postpartum Period

Although there was no cut-off point in the fatigue and energy sub-dimension scores, it was observed that the women who participated in the study had high fatigue scores and low energy scores. In a study, it was found that the mean fatigue score of women was 69.12±17.53, and their mean energy score was 30.14±7.25 (Aktas & Karacam 2017). In the study, it was concluded that the level of postpartum fatigue was high and that their energy deteriorated as their fatigue scores increased.

In this study, those without support for assistance with household chores were found to have higher fatigue scores. Approximately half of the women reported that there were individuals who supported them in household chores. In the study of Elmas and Tokat (2016), it was determined that 66.1% of the mothers received support from the family in the first four weeks postpartum. In their study, Aksakalli et al. (2012) examined the determination of the postpartum support needs and the levels of support received in the postpartum period, and it was determined that 35.9% of the puerperant women received support for infant care in their previous deliveries while 65.9% of them received it in their current deliveries. In a study, approximately half of the women (54%) reported that there were individuals who supported them in household chores and infant care. (Aktas & Karacam, 2017). Aydin et al. (2016) stated that women (60%) received support similar to the results of this study. However, in the study, these variables were not found to be associated with postpartum fatigue. Lai et al. (2015) and Taylor and Johnsob (2010) reported that there was a relationship between experiencing difficulties in infant care activities and fatigue. In the postpartum period, while the woman struggles with both physical and psychological changes, she also tries to breastfeed and care for her newborn infant and carry out household chores. This is a period in which women's nighttime sleep is interrupted due to breastfeeding and they need the support of their spouses and relatives. These results suggest that the support of their spouses and relatives throughout the day will have a positive effect on women's fatigue and sleep quality.

In this study, the fatigue scores of those who had a vaginal delivery were found to be higher. In the studies examining the relationship between the mode of delivery and the level of fatigue in the postpartum period, a relationship was found between the mode of delivery and the fatigue levels of women. It was determined that the level of fatigue was higher in women who had a cesarean delivery compared to those who had a vaginal delivery (Abushaikhaet al., 2018; Lai et al., 2015). Unlike our study, Lai et al. (2015) and Woolhouse et al. (2012) indicated that the level of postpartum fatigue was higher in women who had a cesarean delivery. In some studies, no difference was found between mothers' mean fatigue scores according to the mode of delivery (Isik et al. 2018; Yesilcinar et al., 2017; Aktas & Karacam, 2017; Cheng & Pickler, 2014; Taylor & Johnsob, 2010). When the results obtained from our study and general literature findings are considered, it can be said that the mode of delivery affects the level of postpartum fatigue.

In the study, it was found that women with anemia requiring treatment had low energy scores and high fatigue scores. Furthermore, it was determined that more than half of the women had a vaginal delivery. In a study conducted in the Netherlands, a significant relationship was found between women's (50.3% vaginal delivery, 49.7% cesarean section) fatigue scores and hemoglobin values measured at 12-24 hours postpartum. It was observed that fatigue scores increased with the decrease in hemoglobin values (Gerard et al., 2007). In a meta-analysis study conducted to determine the risk factors for fatigue in the

postpartum period, it was determined that women with low hemoglobin levels were in the moderate risk group for fatigue in the postpartum period (Badr & Zauszniewski, 2017). In some studies, no significant relationship was found between the concepts of anemia and fatigue (Miller et al., 2016; Van Der Woude et al., 2014).

Women's Sleep Quality in the Postpartum Period

In the study, it was observed that the sleep quality of the women was poor (Total PSQI mean score was 15.39±5.82). In their study, Ercel and Sut (2020) determined that women's total PSQI score was (10.1±3.5). In their study, Ko and Lee (2014) found that the total PSQI mean score was 9.37±2.39 among Taiwanese postpartum women. In their study, Ko et al. (2012) reported that the total PSQI mean score of Korean postpartum women was 17.5±6.9. Li et al. (2011) conducted a study on Taiwanese postpartum women, and the total PSQI mean score was found to be 9.94±2.61. In the study of Ercel and Sut (2020), it was determined that the sleep quality of postpartum women was worse compared to the control group. Ozen et al. (2018) conducted a study in order to evaluate sleep quality in postpartum women, and they reported that 82.5% of postpartum women had poor sleep quality. In their study, Yang et al. (2020) indicated that the prevalence of poor sleep quality was 67.2% in postpartum women. Nurses should evaluate the mother's sleep and resting conditions and provide support to ensure adequate rest for the mother. It can be said that the results of our study are similar to the literature.

In the study, it was determined that the sleep quality of women who exclusively fed their infants with formula was worse. In a study, it was found that 88.6% of women whose nighttime sleep was interrupted in the postpartum period had interrupted nighttime sleep in order to breastfeed their infants. (Ercel & Sut, 2020). In the study of Orun et al. (2009), it was determined that 66.8% of mothers with exclusively breastfed infants and 33.2% of mothers with infants who were not exclusively breastfed had irregular sleep. In the study of Hughes et al. (2018), it was determined that women who gave birth and breastfed for the first time slept more than women who fed their infants with a bottle. Montgomery- Dowmns, Clawges, and Santy (2010) reported that they did not find a significant difference between the infants' feeding style and the mother's sleep measurements. In their study, Kendal-Tackett, Cong, and Hale (2011) reported that the method of feeding the infant significantly affected the sleeping hours of mothers and that mothers who fed their infants with mixed method and exclusively fed their infants with formula slept less. In their study, Doan et al. (2014) found that breastfeeding mothers slept more at night. In their study, Elmas and Tokat (2016) compared the average amount of sleep in 24 hours (hours) and sleep duration during the day (minutes) among fully and partially breastfeeding mothers at the end of the first and fourth weeks, and they found that partially breastfeeding mothers slept more than fully breastfeeding mothers. Golbasi, Eroglu, and Kaya (2018) conducted a study to determine the belief in breast milk and breastfeeding myths of women who gave birth, and they found that 45.7% of mothers agreed with the myth “Breastfeeding leaves the mother sleepless and tired”, while 6.7% of them were undecided. Most of the studies support that the total sleep duration of mothers who breastfeed their infants is longer than mothers who feed their infants with formula.

This study showed that the sleep quality of women who participated in the study deteriorated as their fatigue scores increased. In their study, Badr and Zauszniewski (2017) performed the meta-analysis of the factors affecting postpartum fatigue. They reported that infant care difficulties had a minor effect, physiological diseases had a moderate effect, and low ferritin levels, low hemoglobin levels and sleep problems had a large effect on fatigue. In the studies, it was determined that high fatigue level in the postpartum period was associated with low sleep quality (Giallo et al., 2015; Tsuchiya et al., 2016). Nurses should observe mothers' sleep and evaluate their fatigue levels. Mothers who are tired should be provided with help so that they can sleep more comfortably at night.

Limitations of the study: This study has some limitations. First, the main data of the research data (VSSF and PSQI) were obtained by self-report method. Second, the study was

conducted cross-sectionally, and the data obtained are valid only for the time during which the study was conducted, and may change over time. Third, the PSQI assesses the sleep quality in the last month, which may mean that the result of this parameter is not only related to the postpartum period for women in the early postpartum period. Another limitation is that the baby's sleep quality and/or important health problems were not measured in this study. The results obtained from this study are applicable only to the women surveyed, and they cannot be generalized to other women.

Conclusion: Our study shows that as women's fatigue scores increase, their sleep quality also worsens. Low sleep quality and high fatigue level of mothers in the postpartum period are very important risk factors for maternal and infant health. The findings of our study revealed that the sleep quality of those who had health problems during pregnancy, who fed their baby only with formula, who took medication after birth, and who had anemia requiring treatment, were worse. Fatigue levels were found to be higher in those who had health problems during pregnancy, those who gave birth vaginally, those who did not have help in housework, and those who had anemia that required treatment.

Implications for nursing practice: Nurses should carefully monitor the sleep of mothers when they are together with their infants. Mothers should be provided with help when they are tired so that they can sleep more comfortably. It is important to understand the subjectivity and multidimensionality of fatigue and to constantly evaluate sleep. Uninterrupted sleep, less fatigue, and planning nursing interventions to gain maternal skills before discharge will help women to maintain good health.

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