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## The Relationship Between Postpartum Physical Symptom Severity and Sleep Quality in Women with Cesarean Section

Sezaryen ile Doğum Yapmış Kadınlarda Postpartum Fiziksel Semptom Şiddet Yaşama Durumları ile Uyku Kalitesi Arasındaki İlişki

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### ABSTRACT

**Objective:** This study was conducted to examine the relationship between postpartum physical symptom severity and sleep quality among women undergoing cesarean section.

**Methods:** This descriptive cross-sectional study was conducted with a total of 193 women with cesarean section in a city hospital between October 14, 2019 and May 30, 2020. Data were collected using an individual characteristics form, the postpartum physical symptom severity scale (PPSSS) and Pittsburgh sleep quality index (PSQI). Data were evaluated using descriptive statistics, such as number and percentage distributions, t-test, analysis of variance (ANOVA), Mann-Whitney U test, Kruskal-Wallis H test, Pearson's correlation analysis, and linear regression analysis.

**Results:** The women's PPSSS mean score was  $10.38 \pm 5.92$ , suggesting low postpartum physical symptom severity. However, the most common physical symptoms in the fourth postpartum week were poor sleep quality/lack of sleep (85.5%) and perineal/incision pain (82.9%); and their least common physical symptoms were vaginal infection (9.8%) and urinary incontinence (11.4%). In addition, the women's PSQI mean score was  $8.57 \pm 3.53$ , and 83.9% of them had poor sleep quality.

**Conclusion:** There was a statistically significant, positive, moderate relationship between postpartum physical symptom severity and sleep quality in women who underwent cesarean section ( $r=0.438$ ;  $p=0.000$ ) ( $p<0.05$ ), whereby sleep quality decreased as postpartum physical symptom severity increased.

**Keywords:** Cesarean section, postpartum physical symptom severity, sleep quality, obstetrics and gynecology nursing

### ÖZ

**Amaç:** Araştırma, sezaryen ile doğum yapmış kadınlarda postpartum fiziksel semptom şiddet yaşama durumları ile uyku kalitesi arasındaki ilişkiyi incelemek amacıyla gerçekleştirilmiştir.

**Yöntemler:** Tanımlayıcı ve kesitsel nitelikteki bu araştırma, 14 Ekim 2019-30 Mayıs 2020 tarihleri arasında, Sivas Numune Hastanesi'nde sezaryen doğum yapan 193 kadın ile gerçekleştirilmiştir. Veriler bireysel özellikler formu, postpartum fiziksel semptom şiddeti ölçeği ile Pittsburgh uyku kalitesi indeksi (PUKİ) uygulanarak toplanmıştır. Verilerin değerlendirilmesinde, tanımlayıcı istatistik testleri ile sayı ve yüzdeler dağılımları, t-testi, ANOVA varyans analizi, Mann Whitney U testi, Kruskal Wallis H testi, Pearson korelasyon analizi ve Lineer regresyon analizi kullanılmıştır.

**Bulgular:** Araştırmada, kadınların postpartum fiziksel semptom şiddeti ölçeğinden  $10,38 \pm 5,92$  puan aldığı ve postpartum fiziksel semptom şiddetinin düşük düzeyde olduğu saptanmıştır. Bununla birlikte, kadınların postpartum döneminin dördüncü haftasında en çok yaşadıkları fiziksel semptomların yetersiz uyku kalitesi/uykusuzluk (%85,5) ve sezaryen bölgesi/perinede ağrı (%82,9) olduğu; en az yaşadıkları fiziksel semptomların ise vajinal enfeksiyon (%9,8) ve idrar kaçırma (%11,4) olduğu, bu semptomları ise çoğunlukla hafif şiddette yaşadıkları belirlenmiştir. Araştırmada, kadınların PUKİ'den ortalama  $8,57 \pm 3,53$  puan aldığı ve %83,9'unun uyku kalitesinin kötü düzeyde olduğu tespit edilmiştir.

**Sonuç:** Araştırmada, postpartum fiziksel semptom şiddeti ile uyku kalitesi arasında pozitif yönde orta düzeyde ( $r=0,438$ ;  $p=0,000$ ) anlamlı ilişki olduğu ( $p<0,05$ ), postpartum fiziksel semptom şiddeti arttıkça uyku kalitesinin azaldığı sonucuna ulaşılmıştır.

**Anahtar Sözcükler:** Sezaryen, postpartum fiziksel semptom şiddeti, uyku kalitesi, kadın doğum hemşireliği

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## INTRODUCTION

All changes occurring in the body during pregnancy return to a non-pregnant state within six weeks after childbirth (1), but can cause physical symptoms that negatively affect their quality of life. In addition, the mode of delivery also affects these physical symptoms (2). Studies have reported that health problems are more common after cesarean section than after vaginal delivery (3). Especially after cesarean section, several health issues, such as surgical wounds, long-term oral stop, delayed mobilization, delayed onset of mother-infant bonding, breastfeeding, and milk secretion problems, can occur, and the risk of getting infection increases the mother's anxiety, making it difficult for her to adapt to the postpartum period (3). During pregnancy and childbirth, increased need for strength, physical fatigue due to labor, blood loss at birth, and tissue trauma increase postpartum health issues and adversely affect maternal well-being (4). Studies have reported that mothers mostly undergo episiotomy, breast fullness, pain due to cesarean section or hemorrhage, constipation, fatigue, and psychological problems during the postpartum period (5,6). Decreased sleep quality and lack of sleep are also the main problems mothers experience during the postpartum period (7). After childbirth, sleep disorders increase due to sudden decreases in estrogen and progesterone, and women experience drowsiness and insomnia more frequently (8). It was observed that mothers who were in the recovery period after cesarean section were more vulnerable to insufficient sleep due to discomfort and other factors related to surgical recovery, experienced more frequent awakenings at night, and had decreased total sleep time (9). Sleep quality is very important in the process of adaptation to the post-cesarean period, during which physical and psychological problems are experienced, as well as in the process of adaptation to the care of the newborn (10). In this period, women need to sleep more because they struggle with physical and psychological changes on the one hand and try to breastfeed the newborn, care for the newborn, and carry out housework on the other (7,11). The combination of good levels of healthy sleep and quality of life positively affect maternal and infant health (11). Mothers need 20% more sleep at night after giving birth, but they cannot meet this need because of postpartum physical problems (7). Mothers may experience sleep problems, especially in the first months, due to the baby's night care, feeding, and sleep irregularity, or changes in their hormone levels (2). A previous study concluded that 79.5% of mothers had problems sleeping and resting after childbirth (12). In another study, 87.5% of mothers had low sleep quality, which was negatively affected by physical symptoms, frequent waking up at night, inability to sleep with the spouse, stress, and the baby's irregular sleep pattern (13). In the literature, studies on maternal health are mostly conducted on pregnancy and childbirth, and they do not mention the physical symptoms and care needs during postpartum period (4). Studies on mothers' health issues during the postpartum period have examined diverse parameters, such as quality of life, comfort, pain, depression, and fatigue (5,14,15). Sleep disorders are also associated with the postpartum period (8), and they have not been adequately studied in the literature. In addition, the first month postpartum, especially after cesarean section, is a period in which mothers experience anxiety about sleep hygiene because of their recovery after surgery, their adaptation to maternal roles, and their responsibility for taking care of their babies (16).

Accordingly, physical symptoms and sleep problems are intensely experienced in women after cesarean section, and there is limited research on the subject in the literature. Therefore, this study was conducted to examine all health problems during the period after cesarean delivery and the relationship between these problems and sleep quality.

## MATERIAL AND METHODS

### *The Universe and Samples of the Research*

The universe of the study consisted of 1,865 women between January 01, 2018 and June 11, 2019 who underwent cesarean section. The sample of the study comprised those with cesarean section in the obstetrics and gynecology service of the hospital between October 14, 2019 and May 30, 2020, using sampling with a known population size and benefiting from previous studies. In total, 193 women were studied in the research. The power of the test was found as  $p=0.9921818$  (0.99) according to post hoc analysis using the G Power program.

### *Tools*

Data were collected using an individual characteristics form, the Postpartum Physical Symptom Severity Scale (PPSSS) and Pittsburgh Sleep Quality Index (PSQI).

**1. Individual Characteristics Form:** This form was prepared by the researcher and consisted of 15 questions including the mothers' sociodemographic characteristics and information about pregnancy, childbirth, and the postpartum period (2,7,12,17).

**2. Postpartum Physical Symptom Severity Scale (PPSSS):** The scale was improved by Chien et al. (18) to identify the prevalence and persistence of postpartum physical symptoms. The scale consists of a total of 18 items, scoring as 0 (none), 1 (mild), 2 (moderate), and 3 (high). The Turkish validity and reliability of the scale was conducted by Arkan (2). The scale evaluates physical symptoms and their severity, including postpartum perineal/incision pain, lack of sleep, constipation, backache, headache, hemorrhoids, joint pain, vaginal bleeding, vaginal discharge, and infection, numbness in hands and feet, urinary tract infection, urinary incontinence, dizziness, varicose veins, and coldness in hands and feet. Total scale scores range from 0 to 54. Higher scores indicate greater severity of postpartum physical symptoms. For the Turkish version of the scale, internal consistency (Cronbach's alpha) was found as 0.77 at the postpartum 1<sup>st</sup> month and 0.69 at the postpartum year (2). In this study, the reliability coefficient (Cronbach alpha) of the scale was calculated as 0.74.

**3. Pittsburgh Sleep Quality Index (PSQI):** The scale was improved by Buysse et al. (19), and its Turkish validity and reliability studies were conducted by Ağargün et al. (20). The PSQI consists of a total of 24 items to evaluate sleep quality over the past 4 weeks, including 19 self-reported items for respondents and five items for their spouses or roommates. These five items to be answered by the roommate or partner were not included in the scoring. The 19 self-rated items generate seven "component" scores: subjective sleep quality (component 1), sleep latency (component 2), sleep duration (component 3), habitual sleep efficiency (component 4), sleep disturbance (component 5), use of sleeping medication (component 6), and daytime dysfunction (component 7). Each component is

evaluated between 0 and 3 points. The sum of the seven-component scores gives the overall PSQI score, which ranges from 0 to 21 (20). A high total score indicates poor sleep quality, where a score between 0-4 refers to good sleep quality and between 5-21 to poor sleep quality. The scale scores are compared and interpreted for different groups. The Cronbach's alpha internal consistency coefficient of the scale was found as 0.80 (19,20). In this study, the reliability coefficient (Cronbach's alpha) of the scale was calculated as 0.59.

### Data Collection

The data were gathered in two stages. First, the individual characteristics form was implemented for women within 48 hours of their cesarean section operation. Second, home visits were made to women after hospital discharge. Before starting the second stage, the patients' addresses, visiting dates, and times were decided for home visits within one month of discharge, considering their date of cesarean section surgery. Before home visits, women were invited to discuss their availability. During the home visit, the PPSSS and PSQI were applied to the women between October 14, 2019 and May 30, 2020.

### Statistical Analysis

The data were analyzed using the SPSS 23.0 program and appraised using descriptive statistics, such as the number, percentage distribution, mean, range, standard deviation, and maximum and minimum values. Reliability analysis was performed to determine the Cronbach's alpha coefficient of the scales. To determine whether there was a difference between the averages of the independent groups, the t-test was used for two groups with data matching the normal distribution, and ANOVA was used for more than two groups. The Mann-Whitney U test and Kruskal-Wallis H one-way analysis of variance test were used for data that did not match the normal distribution and for more than two independent groups. In this study, Pearson's correlation coefficient analysis was performed to the variables with normal distribution to reveal the relationship between them. Linear regression analysis was used to determine whether postpartum physical symptom severity affected sleep quality. The grade of significance was accepted as  $p < 0.05$ .

### Ethics Approval and Consent to Participate of the Research

Before collecting the data, two ethics committee approvals, including (approval number: 2019-08/04, date: 07.08.2019 and approval number: 2021-03/64, date: 10.03.2021), were obtained from the Sivas Cumhuriyet University Non-interventional Clinical Research Ethics Committee. In addition, permits have been obtained from the institution where the research was conducted and from the provincial health directorate. Verbal/written approval was obtained from all women who attended in the research.

## RESULTS

The women participating in the study; 45.6% were between the ages of 30-35 years with a mean of  $28.75 \pm 4.55$  years, and 49.2% were primary school graduates. Women, 69.9% had 1-3 pregnancies, it was determined that 82.4% had 1-3 births. It was determined that 76.2% of the women did not go for health control while pregnant, 45.1% accepted prenatal education, 74.7% received education from health personnel and at a pregnant school in Table 1.

**Table 1.** Distribution of sociodemographic and fertility characteristics of women after cesarean section

Characteristics	n	%
<b>Age (mean <math>\pm</math> SD: 28.75<math>\pm</math>4.55)</b>		
20-24 ages	40	20.7
25-29 ages	65	33.7
30-35 ages	88	45.6
<b>Educational level</b>		
Literacy	6	3.2
Primary school-middle school	95	49.2
High school	46	23.8
University	46	23.8
<b>Job</b>		
Housewife	135	69.9
Officer	49	25.4
Self-employed	9	4.7
<b>Number of pregnancies (mean <math>\pm</math> SD: 2.98<math>\pm</math>1.68)</b>		
1-3 pregnancies	135	69.9
4-6 pregnancies	49	25.4
7-9 pregnancies	9	4.7
<b>Number of births (mean <math>\pm</math> SD: 2.49<math>\pm</math>1.17)</b>		
1-3 births	159	82.4
4 or more births	34	17.6
<b>Gestational week at delivery (mean <math>\pm</math> SD: 38.59<math>\pm</math>1.31)</b>		
36 <sup>th</sup> week and before	14	7.2
Between the 37 <sup>th</sup> and 39 <sup>th</sup> weeks	136	70.5
40 <sup>th</sup> week and later	43	22.3
<b>Newborn weight (mean <math>\pm</math> SD: 3.345<math>\pm</math>441.60)</b>		
2500-3000 g	41	21.2
3001-3500 g	93	48.2
Over 3501 g	59	30.6
<b>Having had regular health follow-ups during pregnancy</b>		
Yes	46	23.8
No	147	76.2
<b>Having had prenatal education</b>		
Yes	87	45.1
No	106	54.9
<b>Source of prenatal education* (s=87)</b>		
Medical staff and pregnant school	65	74.7
Internet	32	36.8
From my environment (mother, friend, relative)	13	15.0
Book	11	12.7
<b>Total</b>	<b>193</b>	<b>100</b>

\*More than one option was selected by 87 women who were reported to have received prenatal education. SD: Standard deviation.

Mean PPSSS scores of women undergoing cesarean section ranged between 0.14 and 1.45. Their highest and lowest mean scores were  $1.45 \pm 0.94$  for item 2 [poor sleep quality/lack of sleep and  $0.14 \pm 0.46$  for item 10 (vaginal infection)]. Their mean PFSSS score was  $10.38 \pm 5.92$ .

The most common physical symptoms in women at the fourth postpartum week were poor sleep quality/lack of sleep (85.5%) and cesarean section/perineal pain (82.9%), whereas the least common physical symptoms were vaginal infection (9.8%) and urinary incontinence (11.4%), and these symptoms were mostly experienced in mild severity in Table 2.

The women's sleep quality was poor with a mean PSQI score of  $8.57 \pm 3.53$ , and 83.9% of them had poor sleep quality. The PSQI components mean scores were  $1.50 \pm 0.76$  for subjective sleep quality,  $0.69 \pm 0.72$  for sleep latency,  $1.73 \pm 1.13$  for sleep duration,  $1.52 \pm 1.48$  for habitual sleep activity,  $1.53 \pm 0.59$  for sleep disorder,  $0.0 \pm 0.000$  for use of sleeping medication, and  $1.60 \pm 0.99$  for daytime dysfunction in Table 3. There was a statistically significant positive correlation between the PPSSS and the PSQI total mean scores of women who underwent cesarean section ( $r=0.438$ ;  $p=0.000$ ) ( $p<0.05$ ). There was a statistically significant moderately positive correlation between their PPSSS and subjective sleep quality scores ( $r=0.464$ ;  $p=0.000$ ) ( $p<0.05$ ). There was a statistically significant weak correlation between their PPSSS and sleep latency scores ( $r=0.192$ ;  $p=0.008$ ) ( $p<0.05$ ) and between their PPSSS and sleep duration scores in Table 4 ( $r=0.215$ ;  $p=0.003$ ) ( $p<0.05$ ).

## DISCUSSION

In this study, the mean PPSSS score of women was  $10.38 \pm 5.92$  and their postpartum physical symptom severity was low. In the literature, a limited number of studies about the severity of postpartum physical symptoms in women with cesarean section. In contrast to our study, this study found that women who underwent cesarean section had statistically significantly higher postpartum physical symptom severity than those who underwent vaginal delivery (21). Reducing the severity of physical symptoms among postpartum women is important because severe physical symptoms can negatively affect their ability to perform daily activities (21-23). The low severity of physical symptoms in women with cesarean section in our study may be because the majority of them had previous cesarean section and postpartum experiences. In our study, the most common physical symptoms in women were determined as poor sleep quality/lack of sleep (85.5%) and cesarean section/perineal pain (82.8%), and it was understood that these symptoms were mostly experienced with mild severity. In the first study to document that sleep is significantly more important for women hospitalized after cesarean delivery, it was identified that hospitalized mothers who were recovering after cesarean section were more susceptible to insufficient sleep (9). Erbaş (24) concluded that 97% of women who had cesarean section had sleep and resting problems on the second day after discharge, 81.8% at the second postpartum week, and 15.2% at the eighth postpartum week. Studies in the literature support our results. In the postpartum period, women often struggle with both physical and psychological changes and try to breastfeed their newborn babies, take care of them, and fulfill their domestic responsibilities. Therefore, women's nighttime sleep is interrupted by physical symptoms, thereby

**Table 2.** Distribution of postpartum physical symptom severities in women after cesarean section

Symptoms	Severity of symptoms (%)			
	No symptom	Mild severity	Moderate severity	High severity
Poor sleep quality or insomnia	14.5	42.5	26.4	16.6
Pain at the site of cesarean section or perineum	17.1	43.5	26.9	12.5
Back pain	22.3	30.6	29.0	18.1
Headache	39.9	31.1	19.7	9.3
Constipation	48.2	20.7	20.2	10.9
Cold hands and feet	64.8	23.8	8.8	2.6
Feeling cold	65.3	24.4	7.7	2.6
Dizziness	69.4	21.2	8.8	0.6
Joinr pain	72.0	17.2	9.8	1.0
Hemorrhoids	72.0	13.0	9.8	5.2
Numbness in hands	74.1	18.7	6.2	1.0
Excessive vaginal bleeding	76.2	17.6	6.2	0.0
Varicose veins in the legs	79.8	14.0	4.1	2.1
Urinary tract infection	80.8	11.4	4.7	3.1
Excessive vaginal discharge	81.3	13.0	4.7	1.0
Numbness in feet	83.9	11.9	4.2	0.0
Urinary incontinence	88.6	8.8	1.6	1.0
Vaginal infection	90.2	6.2	3.1	0.5

**Table 3.** Distribution of mean PSQI scores among women with cesarean section

PSQI and its components	Mean $\pm$ SD	Median	Min.-max.
Subjective sleep quality	1.50 $\pm$ 0.76	1	0-3
Sleep latency	0.69 $\pm$ 0.72	1	0-3
Sleep duration	1.73 $\pm$ 1.13	2	0-3
Habitual sleep efficiency	1.52 $\pm$ 1.48	2	0-3
Sleep disturbances	1.53 $\pm$ 0.59	1	0-3
Use of sleep medication	0.0 $\pm$ 0.000	0	0-0
Daytime dysfunction	1.60 $\pm$ 0.99	3	0-3
<b>PSQI total</b>	<b>8.57<math>\pm</math>3.53</b>	<b>15</b>	<b>1-17</b>
<b>Sleep quality level</b>		<b>Number</b>	<b>Percentage</b>
Good sleep quality		31	16.1
Poor sleep quality		162	83.9

SD: Standard deviation, PSQI: Pittsburgh sleep quality index, Min.: Minimum, max.: Maximum.

**Table 4.** Relationship between the PPSSS and PSQI Scores of women after cesarean section

Characteristics	Postpartum physical symptom severity scale		
	S	r <sup>a</sup>	p
Subjective sleep quality	193	0.464	<b>0.000*</b>
Sleep latency	193	0.192	<b>0.008*</b>
Sleep duration	193	0.215	<b>0.003*</b>
Habitual sleep efficiency	193	0.116	0.110
Sleep disturbances	193	0.545	<b>0.000*</b>
Use of sleep medication	193	0.327	<b>0.000*</b>
<b>PSQI total</b>	<b>193</b>	<b>0.438</b>	<b>0.000*</b>

<sup>a</sup>Pearson's correlation analysis was applied, \*p<0.05.

PPSSS: Postpartum physical symptom severity scale, PSQI: Pittsburgh sleep quality index.

decreasing their sleep quality. One of the most common physical symptoms experienced by women in our study was pain in the cesarean section/perineal (82.8%). A previous study found that all women described pain of varying severity, from mild to unbearable, after cesarean section (25). Another study also reported that all women experienced pain at the incision site after cesarean section on the second day after discharge and in the second week postpartum, and 30.3% of them experienced this pain even in the eighth postpartum week (24). Studies support our study, suggesting that post-cesarean pain is common in women. This result may be attributed to uterine contractions, postoperative pain, and incision size due to increased vessel and nerve damage as the incision length increases. Therefore, both pharmacological and non-pharmacological methods should be used to relieve pain experienced by women. In our study, the least common physical symptoms in women were vaginal infection (9.8%) and urinary incontinence (11.4%), and it was understood that these symptoms were mostly experienced with mild severity. There are only a limited number of studies on this subject. A previous study found that 40.7% of women who underwent cesarean section had urinary incontinence after delivery, which was significantly higher in our study (26). In another study, urinary incontinence was the most common symptom experienced by women who underwent cesarean section (27). The results in the literature differ from those of our

study. This may be because elective cesarean section has a positive effect on urinary incontinence as it protects pelvic tissues and because the women who did not have incontinence problems before delivery were included in the study. In our study, women who underwent cesarean section had poor sleep quality, with a PSQI mean score of 8.57 $\pm$ 3.53, and 83.9% of them had poor sleep quality. Tzeng et al. (16), found that postpartum mothers' sleep duration, subjective sleep quality, and daytime dysfunction scores of postpartum mothers were highest in the first month after cesarean section. A previous study reported the PSQI total mean score of postpartum women as 10.1 $\pm$ 3.5 (11). Another study reported that 83.6% of mothers had poor sleep quality (17). In another study, found the prevalence of poor sleep quality in postnatal women was 67.2% (28). Both the literature and our study suggest that postpartum women have poor sleep quality. These results may be because women had physical and hormonal changes that occurred in the postpartum period after cesarean section, the lack of sufficient time to rest, the wake up more frequently at night due to the care needs of the newborn, and experienced postpartum stress. These results may also be because the majority of women in our study had nuclear family, therefore they had inadequate number of family members who could support them during the postpartum period. Our study found a significant positive correlation between the PPSSS and PSQI total mean scores of women undergoing

cesarean section ( $r=0.438$ ;  $p=0.000$ ) ( $p<0.05$ ). This result suggests that as the severity of postpartum physical symptoms of women with cesarean section increases, their sleep quality decreases. Postpartum mothers need 20% more sleep at night after delivery, but this need cannot be met due to postpartum physical problems (7). A study on sleep quality in the postpartum period has concluded that sleep problems complicated the mother's health status and negatively affected the care needs of the newborn (8). Ko et al. (13) found that 87.5% of mothers had poor sleep quality due to physical symptoms, frequent waking up at night, inability to sleep with the spouse, stress, and the baby's sleep pattern. Another study found that poor sleep quality was positively correlated with the severity of postpartum physical symptoms, sharing a room with the babies, and lack of exercise (29). The literature results support our study, suggesting that the severity of physical symptoms in women during the postpartum period negatively affects their sleep quality. Our study found a significant positive correlation between the PPSSS and mean subjective sleep quality scores of women who underwent cesarean section ( $r=0.464$ ;  $p=0.000$ ) ( $p<0.05$ ). This result suggests that as the severity of postpartum physical symptoms of women increases, their subjective sleep quality decreases. Our study found a significant positive weak correlation between the mean PPSSS and sleep latency scores ( $r=0.192$ ;  $p=0.008$ ) ( $p<0.05$ ). This result indicates that as the severity of postpartum physical symptoms increases, sleep latency decreases. There was a weak positive correlation between the PPSSS and mean sleep duration scores of women ( $r=0.215$ ;  $p=0.003$ ) ( $p<0.05$ ). This result indicates that as the severity of postpartum physical symptoms of women increases, their sleep duration decreases. There was a moderately significant positive correlation between the mean scores of the PPSSS and sleep disorder in women ( $r=0.545$ ;  $p=0.000$ ) ( $p<0.05$ ). This result demonstrates that as the severity of postpartum physical symptoms increases, sleep disturbance also increases. Our study concluded that there is a relationship between postpartum physical symptom severity and sleep quality in women who have undergone cesarean section, whereby sleep quality decreases as postpartum physical symptom severity increases. More studies are needed to better comprehend the relationship between sleep quality and postpartum physical symptom severity, which affects maternal health (9). It is necessary to determine the factors affecting postpartum sleep quality and the problems that postpartum mothers may encounter in advance (17). Therefore, determining the causes that negatively affect sleep quality in the postpartum period and developing solutions by nurses in parallel can provide significant gains for maternal and newborn health (17). Sleep quality should be evaluated with nursing interventions, especially in women in the postpartum period, and postpartum women should be trained to manage their postpartum physical symptoms and improve sleep quality (29).

## CONCLUSION

As a result of our study, the mean PSQI score of women was found to be  $8.57\pm 3.53$  and 83.9% of them had poor sleep quality. In addition, it was concluded that there is a significant relationship between postpartum physical symptom severity and sleep quality ( $p<0.05$ ) and sleep quality decreased as postpartum physical symptom severity increased. In line with these results, as postpartum physical

symptom severity affects sleep quality in with cesarean section, it may be recommended to teach postpartum women and other family members coping methods to reduce the severity of physical symptoms and to plan training programs for healthcare professionals who care for postpartum women.

## Ethics

**Ethics Committee Approval:** Before collecting the data, two ethics committee approvals, including (approval number: 2019-08/04, date: 07.08.2019 and approval number: 2021-03/64, date: 10.03.2021), were obtained from the Sivas Cumhuriyet University Non-interventional Clinical Research Ethics Committee.

**Informed Consent:** Verbal/written approval was obtained from all women who attended in the research.

## Authorship Contributions

Concept: M.Y., N.E., Design: M.Y., Supervision: M.Y., N.E., Materials: M.Y., Analysis or Interpretation: M.Y., N.E., Literature Search: M.Y., N.E., Writing: M.Y., Critical Review: M.Y., N.E.

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