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The Relationship of Premenstrual Syndrome Symptoms with Menstrual Attitude and Sleep Quality in Turkish Nursing Student

Özlem Açı*, Fulya Gökdemir¹, Hatice Kahyaoğlu Süt², Fatma Payam¹

¹Department of Nursing, Artvin Health High School, Artvin Çoruh University, Artvin, Turkey

²Department of Women's Health and Nursing, Faculty of Health Sciences, Trakya University, Edirne, Turkey

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ABSTRACT

Introduction: Symptoms induced by premenstrual syndrome (PMS) adversely affect the women in reproduction period and decrease their quality of life. In literature, it is a common opinion thought that PMS could be associated with both sleep quality and menstrual attitudes. However, there has been no sufficient number of studies to define in what ways the PMS symptoms are correlated with sleep quality and menstrual attitudes. The objective of this study was to examine the relationship of PMS symptoms with menstrual attitude and sleep quality.

Methods: The data were collected from 183 nursing students at Health School of Artvin Çoruh University by using a cross-sectional design. Voluntary students completed a questionnaire involving socio-demographic characteristics, Premenstrual Syndrome Scale (PMSS), Menstrual Attitude Questionnaire (MAQ), and Pittsburgh Sleep Quality Index (PSQI).

Results: Average age was 19.9 (1.8). The study determined a positively significant correlation between score of PMSS and mean scores of PSQI ($r=0.306$; $P<0.001$), and a negatively significant correlation between score of PMSS and total mean score of MAQ ($r=-0.317$; $P<0.01$). Similarly, multiple linear regression analysis showed that PSQI total score ($\beta=5.412$; $P<0.001$) and MAQ total score ($\beta=-27.455$; $P=0.001$) significantly affected total score of PMSS.

Conclusion: The intensity of PMS symptoms is associated with poor sleep quality and negative menstrual attitudes. Determining the methods of coping with PMS and strengthening the young girls on this subject may enhance their quality of future life.

Introduction

Starting with menarche and continuing until menopause, menstruation is a physiological condition.^{1,2} It is known that three out of every four women may experience slight physical and mental disorders before menstruation.¹ However, menstrual disorders may become more serious in some women and especially the problems like dysmenorrhea, menstrual irregularity and premenstrual syndrome may negatively affect women, their families and the social environment.²⁻⁴

Being encountered in many women of reproductive age, the Premenstrual

Syndrome (PMS) is a set of physical, cognitive, emotional, and behavioral symptoms that periodically emerge in the luteal phase of the menstrual cycle and rapidly recover with the start of menstruation or a few days after the menstruation.^{2,4-7} It is known that PMS especially affect the young and emerge in adolescence at the rate of 25% and around the ages of 14-15 years in average or 2 years after the menarche.^{1,2,7} Approximately 80-95% of women of reproductive age complain about PMS symptoms to varying degrees. On the other hand, about 5-10% of women experience serious PMS that requires a treatment.^{1,2,5,7} The studies conducted with university

* Corresponding Author: Özlem Açı (PhD), email: asci.s.ozlem@gmail.com.

students in Turkey have reported that the prevalence of PMS varies between 5% and 79.9%.^{2,5,7-9}

Epidemiology, etiology, and pathophysiology of PMS have not been known, yet. In literature, it is a common opinion that hormonal, genetic, psychosocial, and lifestyle factors may be effective on development of PMS.^{1,2,8} Additionally, it is reported that factors such as menstrual attitudes, the culture, education of the individual's mother and her working condition and menstrual problems such as dysmenorrhea may also affect the prevalence of PMS.⁸ Furthermore, a limited number of studies have examined the relationship between menstrual attitudes and PMS. While Song et al., stated that individuals having a negative attitude towards menstruation experienced PMS more severely, Guvenc et al., expressed that individuals, who considered the menstruation as a debilitating phenomenon and denied the menstrual symptoms, experienced PMS much more.^{10,11} There are more than 200 PMS symptoms experienced.² Depression, anxiety, fatigue, irritability, outbursts of anger and crying spells, disturbance in social relations, difficulty of concentration and confusion, headache, joint pain and abdominal pain, edema and weight gain, changes in libido and appetite, gastrointestinal symptoms, tenderness on breasts, sleep problems like insomnia and hypersomnia are among examples of these symptoms.^{1,5,8,12}

Women with PMS frequently complain about poor sleep quality because PMS is one of the physiological disorders that may change the sleep quality by causing sleep problems such as insomnia, hypersomnia, exhaustion, fatigue, difficulty of concentration, and nightmares. Especially women with severe PMS have greater sleep problems.^{1,5,13}

PMS is an important problem which decreases women's self-confidence, impairs physical, mental and social health, causes the labor loss, negatively affects the daily life,

sleep quality, social activities, family relations, attendance on lessons and academic achievement and consequently decreases the quality of life.^{1,3-5,8} Thus, the detection of women with PMS, determination of their frequent symptoms, and the definition of relevant variables increasing these symptoms may guide the interventions (such as giving information, developing positive attitudes, and increasing the coping mechanisms regarding the menstrual cycle and PMS) to be planned in decreasing the PMS-induced problems.^{4,8} In literature, it is a common opinion thought that PMS could be associated with both sleep quality and menstrual attitudes.^{5,10,11} However, there has been no sufficient number of studies to define in what ways the PMS symptoms are correlated with sleep quality and menstrual attitudes.

The purpose of this study was to reveal the relationship between the PMS symptoms, menstrual attitude and sleep quality in nursing students receiving education at a high school.

Materials and methods

This cross-sectional, descriptive and correlational study was conducted in the province of Artvin between 01 September 2014 and 30 November 2014. Population of the study consisted of nursing students receiving education at Health High School of Artvin Çoruh University. In the study, it was aimed to reach the whole population without using the sample selection methods. There were 254 nursing students receiving education at the high school between the dates when the study was conducted. However, 71 students were not included in the study due to reasons such as the education mobility, class nonattendance and rejection of participating in the study. The study was completed with n=183 female students who constituted 72% of the population. While the inclusion criteria of this study were as follows; being single, being woman and accepting to participate in

the study, failure to precisely fill out the questionnaire and scales was accepted as the exclusion criteria.

The data of the study were collected by using personal information form^{2-5,8-11}, which was prepared by researchers in accordance with literature and involved socio-demographic and menstrual characteristics, as well as the Premenstrual Syndrome Scale (PMSS), Menstrual Attitude Questionnaire (MAQ), and Pittsburgh Sleep Quality Index (PSQI) whose validity and reliability were verified.

Being developed by Gençdoğan in order to determine the severity of premenstrual symptoms based on the Diagnostic and Statistical Manual of Mental Disorders third edition (DSM III) and Diagnostic and Statistical Manual of Mental Disorders Revised fourth edition (DSM-IV-R); PMSS is a valid and reliable assessment instrument.¹ This five-point Likert scale is commonly used in Turkey. The scale involves 44 items to be marked by the individual by taking "to have this condition the week before menstruation" into consideration. PMSS consists of nine subscales (Depressive affect, Anxiety, Fatigue, Irritability, Depressive thoughts, Pain, Changes in appetite, Changes in sleeping habits, bloating). The Cronbach's Alpha reliability coefficient is 0.75 for the original scale and 0.97 for this study. While the lowest score to be obtained from the scale is 44, the highest score is 220. It is accepted that as the score obtained by the individual from the scale increase, the intensity of PMS symptoms increases, as well.^{1,5,8,9,11}

Being developed by Brooks-Gunn and Ruble in order to measure the menstrual attitudes, MAQ was adapted into the Turkish culture by Firat et al., in 2009.^{14,15} The Turkish version of the scale is graded in five-point Likert type and consists of totally 31 items and five subscales (menstruation as a debilitating event, menstruation as a bothersome event, menstruation as a natural event, anticipation and prediction of the onset of menstruation, denial of any effects of

menstruation). Highness of the mean scores obtained from the scale signifies that the attitude towards the menstruation is positive.^{11,15} The Cronbach's Alpha reliability coefficient is 0.79 for the Turkish form of the scale and 0.61 for this study.

PSQI was developed by Buysse et al., and adapted into Turkish by Ağargün et al., PSQI is a self-report scale involving totally 19 items and seven subscales (subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction) that evaluates the sleep quality and disorder within the last one month.^{16,17} Each component is evaluated on the basis of 0-3 points. Total score varies between 0-21 points. While those with a PSQI score of ≤ 5 are evaluated as having a good sleep quality, those with a PSQI score of >5 are evaluated as having a poor sleep quality.¹⁷

Post hoc power analysis was performed based on minimum correlation coefficient ($r = -0.232$) between total score of PMSS and total score of MAQ. The power of this study was found as 0.88 based on this correlation coefficient with an alpha level of 5% and sample size of 183. Statistical analysis of the data was performed by using the SPSS 20.0 statistical package software. The data were presented as mean (standard deviation) and frequency n (%). Spearman correlation analysis was used to evaluate the correlations between PMSS, PSQI, and MAQ. Effect of menstrual attitudes and sleep quality on PMSS scores was investigated by multiple linear regression analysis. The limit value of the statistical significance was accepted as $P < 0.05$.

Before starting the study, an ethical approval was received from Ethics Committee of the Rectorship of Artvin Çoruh University. The data were collected in such a way to coincide with extracurricular times of students. Before collecting the data, two researchers informed students, who were voluntary to participate in the study, about the purpose and period of the study and

written consents of all participants were obtained.

Results

This study was completed with 183 nursing students who were single, had an age average of 19.9 (1.8) and stated mostly a moderate-low level of income (84.2%). The menarche age and menstruation duration mean of students were determined respectively as 13.3 (1.2) and 5.6 (1.4). 90.7% of students stated that they had regular menstruation with periods of 21-35 days.

Table 1 illustrates the mean scores obtained by students from PMSS and its subscales, as well as standard deviations and value ranges. In the study, a positive, significant and linear correlation was determined between total score of PMSS and mean score of PSQI of students ($r=0.306$, $P<0.001$) Considering the results of the Spearman correlation analysis between mean scores of PMSS subscales and the total mean score of PSQI (Table 2); it was observed that there were positive and significant correlations between total mean score of PSQI and all subscale mean scores except for the subscale "changes in appetite", Mean scores of PSQI increased with the increase of the total and subscale mean scores of PMSS (except for the subscale "changes in appetite").

As a result of the study, a negative, significant and linear correlation was determined between total mean score of PMSS and total mean score of MAQ ($r=-0.232$, $P=0.002$) Negative and significant correlations were determined between all the subscale mean scores of PMSS and mean scores of MAQ subscales "Menstruation as a debilitating event" and "Anticipation and prediction of the onset of menstruation". While all the subscale mean scores of PMSS increased, the mean scores in these two subscales of MAQ decreased. Similarly, negative significant correlations were determined between mean scores of subscales "Depressive affect, Fatigue,

Irritability, Depressive thoughts, Bloating" of PMSS and total mean score of MAQ (Table 2).

Negative significant correlations were determined between mean scores of the subscales "Irritability, Pain, Changes in appetite, and Bloating" of PMSS and mean score of the subscale "Menstruation as a natural event" of MAQ and mean score of the subscale "Bloating" of PMSS and mean score of the subscale "Denial of any effects of menstruation" of MAQ. Accordingly, while mean scores of the subscales "Irritability, Pain, Changes in appetite, and Bloating" of PMSS increased, mean score of the subscale "Menstruation as a natural event" of MAQ decreased. Similarly, while the mean score of the subscale "Bloating" increased, mean score of the subscale "Denial of any effects of menstruation" of MAQ decreased (Table 2).

Effect of menstrual attitudes and the sleep quality on PMSS scores was investigated by multiple linear regression analysis. Similarly to the correlation analysis, it was showed that PSQI total score ($P<0.001$) and MAQ total score ($P=0.001$) significantly affected PMSS total score (Table 3).

Discussion

This study, conducted in order to determine the relationship between the PMS symptoms and menstrual attitudes and sleep quality, was completed with 183 single nursing students in the late adolescence period.

In the study, while the menstrual attitudes were evaluated by using MAQ, the sleep quality was assessed by using PSQI. These two assessment instruments are valid and reliable assessment instruments which have been commonly used in both Turkey and different countries.^{5,11,16-18} In a study evaluating the sleep quality in women with severe PMS through polysomnographic and quantitative electroencephalography measurements; anxiety was observed to have a strong effect on sleep quality and it was reported that controlling the affective

Table 1. Distribution of total and subscale mean scores of PMSS (n=183)

	Mean (SD)	Minimum-Maximum	95% Confidence Interval
Total score of PMSS	114.6 (37.8)	44-220	109.1 – 120.1
Subscale score of PMSS			
Depressive affect	19.2 (7.6)	7-35	18.1 – 20.3
Anxiety	14.4 (6.5)	7-35	13.5 – 15.4
Fatigue	17.4 (6.1)	6-30	16.5 – 18.3
Irritability	14.3 (5.9)	5-25	13.5 – 15.2
Depressive thought	16.5 (7.4)	7-35	15.4 – 17.6
Pain	8.6 (3.2)	3-15	7.0 – 8.0
Changes in appetite	8.6 (3.9)	3-15	8.0 – 9.2
Changes in sleeping habits	7.0 (3.3)	3-15	6.5 – 7.5
Bloating	9.3 (4.1)	3-15	8.7 – 9.9

Table 2. Results of the Spearman correlation analysis between PMSS and MAQ and PSQI (n=183)

	Total and Subscale scores of PMSS									
	Depressive affect	Anxiety	Fatigue	Irritability	Depressive thought	Pain	Changes in appetite	Changes in sleeping habits	Bloating	Total
PSQI total	r 0.267 ^a	0.266 ^a	0.232 ^b	0.208 ^b	0.233 ^b	0.369 ^a	0.130	0.306 ^a	0.207 ^b	0.306 ^a
MAQ subscale										
Menstruation as a debilitating event	r -0.270 ^a	-0.173 ^c	-0.369 ^a	-0.270 ^a	-0.266 ^a	-0.174 ^c	-0.157 ^c	-0.219 ^b	-0.275 ^a	-0.317 ^a
Menstruation as a bothersome event	r 0.009	0.081	-0.036	0.007	0.059	0.022	-0.015	0.011	-0.048	0.012
Menstruation as a natural event	r 0.080	0.078	0.130	0.192 ^b	0.073	0.213 ^b	0.163 ^c	0.108	0.239 ^b	0.144
Anticipation and prediction of the onset of menstruation	r -0.322 ^a	-0.161 ^c	-0.378 ^a	-0.497 ^a	-0.258 ^a	-0.321 ^a	-0.323 ^a	-0.218 ^a	-0.433 ^b	-0.404 ^a
Denial of any effects of menstruation	r -0.040	0.045	-0.066	-0.070	-0.020	-0.044	-0.031	-0.073	-0.223 ^b	0.075
MAQ total	r -0.198 ^b	-0.069	-0.260 ^a	-0.211 ^b	-0.155 ^c	-0.088	-0.121	-0.140	-0.271 ^a	-0.232 ^b

Note. ^ap < 0.001, ^bp < 0.01, ^cp < 0.05

Table 3. Effect of menstrual attitudes and sleep quality on total scores of PMSS

	Unstandardized Coefficients		t	p
	Beta	Std. Error		
PSQI total score	5.412	0.967	5.594	<0.001
MAQ total score	-27.455	7.894	-3.478	0.001
Adjusted R²	% 16.9			

symptoms in women with PMS would increase the subjective sleep quality.¹⁹ In their study on female university students, Cheng et al., determined a positive significant correlation between PMS and PSQI scores.²⁰ In the same study, the sleep quality was reported to be poor in 60.5% of girls with PMS and in 40.7% of girls without PMS. Comparing the relationship between the period when women with PMS have no

symptoms and the period when their symptoms exacerbate, Baker and Colrain determined that women showed a psychomotor retardation and became more tired and sleepy in the period when the symptoms increased.²¹ In a study conducted by Ozişik Kahraman et al., on female students receiving education at a health high school, they determined a significantly poor sleep quality in 75.6% of

girls with PMS and in 58.8% of girls without PMS.⁵ In the same study, a positive correlation was reported between total score of PMSS and mean score of PSQI. There was a positive significant correlation between total score of PMSS and scores of PSQI, which was in accordance with literature. In girls with PMS, the sleep quality worsened and as the PMS symptoms exacerbated, the sleep quality (except for the appetite change) negatively changed, as well.

In this study, there was a negative significant correlation between the general attitudes towards menstruation, considering the menstruation a debilitating event and anticipation and prediction of the onset of menstruation, and complaining about the severity and symptoms of PMS. There was a higher rate of complaining about severity and symptoms of PMS in those displaying negative attitudes towards menstruation, considering the menstruation a debilitating event and failing to predict the changes concerning menstruation on themselves. In parallel with this study, Song et al., stated that negative menstrual attitudes in nursing students were related to the severity of PMS and Guvenc et al., reported that PMSS scores were significantly higher in those considering the menstruation a debilitating event.^{10,11} In literature, it remains in the forefront that positive and negative attitudes towards menstruation are effective on women's perceiving and complaining about physiological and psychological symptoms in the menstrual period.^{15,22} However, it is difficult to interpret this difference since there is a limited number of studies examining the relationship of menstrual attitudes with complaining about PMS. In addition, PMS symptoms may be the cause of menstrual perception changes and the change in an individual's menstruation perception may also cause the PMS symptoms to be felt in an excess or exaggerated way. The future studies may

focus on to what extent the menstrual attitudes affect PMS on the basis of the relationships revealed in this study.

This study revealed that there was a negative significant correlation between scores of the subscales Depressive affect, Fatigue, Irritability, Depressive Thoughts and Bloating and total scores of MAQ. Experiencing the symptoms of bloating, fatigue, irritability, depressive thoughts and depressive affect more frequently in the premenstrual period was related with negative menstrual attitudes. In parallel with this study, Lu revealed that women's attitudes towards menstruation were related with physical, cognitive, behavioral, and psychological symptoms in the premenstrual and menstrual phases.¹⁸ In this study, there was a negative significant correlation between scores of the subscales "Irritability, Pain, Changes in appetite and Bloating" and the score of the subscale "Menstruation as a natural event" and between the score of the subscale "Bloating" and the score of the subscale "Denial of any effects of menstruation". This relationship could be interpreted as follows; individuals not considering the menstruation a natural event experience the symptoms of irritability, pain, changes in appetite and bloating more intensely and individuals experiencing the symptoms of bloating more intensely, on the other hand, have a higher tendency to deny the effects of menstruation. Chaturvedi and Chandra reported attitudes regarding the premenstrual experiences and disturbing symptoms were related with debilitating and bothersome attitudes.²³ Kısa et al., reported that students, who thought that they have insufficient knowledge about menstruation (70.7%) and had negative reactions against menstruation (69.6%), experienced the PMS more frequently.⁸ Sönmezer and Yosmaoğlu determined that women with dysmenorrhea did not consider the menstruation a natural event and they felt physiological and

psychological symptoms such as pain, cramp, nausea and weakness more intensely than women without dysmenorrhea.²⁴ As severity of premenstrual and menstrual symptoms in young girls increases, negative attitudes towards menstruation increase; which constitutes a never-ending vicious cycle.^{18,24} It is recommended that educational interventions for helping young girls to cope with PMS should aim to bring in positive menstrual attitudes.

This study has some limitations. The first one is that even though the study included students coming from different cities of Turkey to receive education, it was conducted at a high school in only one province. The second one is that the sample group consisted of students receiving medical education and the data were based on self-report instead of prospective reports (such as PMS diaries) or clinical measurements (such as polysomnography) because receiving medical education might have either enabled students to declare the changes on themselves more easily or caused them to be exaggerated or prejudiced. Additionally, the fact that the data collection tools in this study were valid and reliable and the medical personnel in the clinic suggested they were cheaper and more efficient in diagnosis enabled the assessment and interpretation of the data. These limitations should be taken into consideration while interpreting the data.

Conclusion

PMS symptoms had a positive relationship with sleep quality and a negative relationship with menstrual attitudes. Considering the menstruation a debilitating event and failing to predict the changes regarding menstruation were related with complaining about the severity and symptoms of PMS. As the complaints about the symptoms of fatigue, irritability, depressive thoughts and bloating increased, the menstrual attitudes became more

negative. Significant correlations presented in this study may be guiding in planning educational interventions aimed at coping with PMS symptoms, decreasing the complaints about poor sleep quality caused by PMS and developing positive menstrual attitudes. In addition, determining and changing the reasons behind the negative menstrual attitudes in female students may enable us to decrease the symptoms caused by PMS and the prevalence of PMS. Determining the methods of coping with PMS and strengthening the young girls on this subject may enhance their quality of future life.

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Ethical issues

None to be declared.

Conflict of interest

The data of this study were presented at the 14th National Nursing Student Congress as a poster in 22-26 April 2015.

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