Original Article

Determinants of Premenstrual Syndrome Among Medical Students- Samsun sample

Tıp Öğrencilerinde Premenstrüel Sendromun Belirleyicileri- Samsun örneği

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Abstract

Background: Premenstrual syndrome (PMS) is defined as a term involving physical, psychical and behavioral alterations that repeat in several cycles. The present study aimed to analyze the prevalence and affecting factors of premenstrual syndrome in students in a medical faculty. **Material and Methods:** We designed a sectional study conducted in between July and October 2016 among the single students aged between 17 and 49 years. "Survey of PMS" and "Menstrual Distress Questionnaire" were performed on the participants. **Results:** The mean age of the participants (n=286) was 20.67±1.91 years and the mean age of first menstruation was 13.07±1.19 years. PMS was present in 18.9% (n=54). The mean age of initial menstruation of students having PMS was observed to be lower (p<0.05). The ratio of students diagnosed with PMS who considered that this period was a physiological period was lower than those not diagnosed with PMS (p<0.05). For having diagnosis of PMS, the most common complaints before the menstruation were anxiety (78.8%), during the menstruation period was stomachache (72.2%), and skin spot and ache (29.6 %) in other days. Negative sensation subgroup was the overall most common complaints in the pre-menstruation period, in the course of menstruation and post-menstruation period. **Conclusions:** The recorded complaints about PMS are negatively affecting the familial conditions and social integration of the patients. It is important to define the disease and provide treatment to avoid biopsychosocial factors in women and their families.

Keywords: Premenstrual syndrome, faculty, students

ÖZ

Amaç: Premenstrüel sendrom (PMS), birkaç döngüde tekrarlayan fiziksel, ruhsal ve davranışsal değişiklikleri içeren bir terim olarak tanımlanmaktadır. Bu çalışmada bir tıp fakültesinin öğrencilerinde premenstrüel sendrom prevalansı ve etkileyen faktörlerin incelenmesi amaçlanmıştır. **Gereç ve Yöntem:** Yaşları 17 ile 49 arasında değişen bekar öğrenciler arasında Temmuz ve Ekim 2016 arasında yürütülen bir kesitsel çalışma tasarladık. Katılımcılara "PMS Anketi" ve "Menstrüel Distres Anketi" uygulandı. **Bulgular:** Katılımcıların (n=286) yaş ortalaması 20,67±1,91 yıl ve ortalama ilk adet görme yaşı 13,07±1,19 yıl idi. %18,9'unda (n=54) PMS mevcuttu. PMS olan öğrencilerin ortalama ilk adet görme yaşının daha düşük olduğu gözlendi (p<0,05). Bu dönemi fizyolojik bir dönem olarak gören PMS tanısı alan öğrencilerin oranı PMS tanısı almayanlara göre daha düşüktü (p<0,05). PMS tanısı için adet öncesi en sık şikayetler anksiyete (%78,8), adet döneminde karın ağrısı (%72,2), diğer günlerde cilt lekesi ve ağrısı (%29,6) idi. Negatif duyum alt grubu menstrüasyon öncesi, menstrüasyon seyri ve menstrüasyon sonrası dönemde genel olarak en sık görülen şikayetlerdi. **Sonuç:** Kaydedilen PMS şikayetleri hastaların ailevi durumlarını ve sosyal bütünleşmelerini olumsuz etkilemektedir. Kadınlarda ve ailelerinde biyopsikososyal faktörlerden kaçınmak için hastalığın tanımlanması ve tedavisinin sağlanması önemlidir. **Anahtar Kelimeler:** Premenstrüel sendrom, fakülte, öğrenciler

Highlights

- The present study aimed to analyze the prevalence and affecting factors of premenstrual syndrome in students in a medical faculty.
- The recorded complaints about PMS are negatively affecting the familial conditions and social integration of the patients.

Introduction

Premenstrual syndrome (PMS) is a common cyclical disorder characterised by biopsychosocial problems, often observed in young and middle-aged women, developing during the luteal phase of a woman's menstrual cycle and ending with the onset of menstruation. The indisputable prevalence, frequent failure in diagnosis, and difficulty of treatment make this disorder significant. Being a pathology brought about by a cycle lasting approximately 30–35 years, PMS has the potential to turn the lives of women into a nightmare. PMS has been added to DSM-V under the heading of depressive disorders as 'Premenstrual Dysphoric Disorder'. Based on this definition, there must have been certain complaints (e.g. decreased interest in activities, significant depressive mood, significant anxiety) during the last week of the luteal phase in most menstrual cycles on a regular basis during the last year; these complaints must have disappeared within a few days after the onset of menstrual bleeding; these complaints must have been at such a severe level so as to cause disturbances in work, school life or routine activities and must not have been present for at least 1 week after menstruation (1).

Although many authors consider that PMS is one of the most common diseases of the world, some authors suggest that it is a manifestation of physiological changes and not a disease. It may be difficult to make this distinction. According to the literature, 70%–90% of women in their reproductive period have some complaints associated with menstruation. However, 20%–40% of women have more advanced mental and physical dysfunctions (2). Mood and behavioural disorders play a major role in PMS complaints (3).

The present study aimed to analyse the presence of PMS and affecting factors in students of a faculty of Medicine. The analysis of these factors may contribute to the prevention or treatment of PMS.

Materials and Methods

Study Design

This study was conducted as a single-centre survey and included single women aged between 17 and 49 years who had been studying at OMU Faculty of Medicine. There were approximately 1,200 students in the preparatory, 1st, 2nd, 3rd, 4th, 5th and 6th year classes. Approximately 50% (600) of these students were females. When this population size was analysed with a 95% confidence interval (alpha = 0.05) and a possible sampling error of d = 0.05, it was noted that at least 235 participants were needed. Among the current female students, 316 were reached, 19 were excluded from the study because they refused to participate and 11 were excluded because of missing data in their questionnaires. A total of 286 participants were included in the study.

Participants were interviewed in their classrooms, in laboratories, on campus and in the hospital. Two questionnaires were conducted. In addition to the questions about demographic characteristics, the first questionnaire prepared by the researcher comprised questions about the prevalence of PMS among the participants. Names, national ID numbers or photographs of the participants were not disclosed. In addition, a second questionnaire that comprised the 'Menstrual Distress Complaint List' was given to the participants. During the collection of data, the participants were instructed on how to fill out the data collection form and the Menstrual Distress Complaint List, and they were asked to fill out the forms on their own so that there would be no interference by the researcher. The filling of the forms took approximately 25–30 minutes.

PMS Prevalence Questionnaire

This questionnaire comprised 15 + 3 questions. In the first part comprising 15 questions, the participants' smoking, tea, coffee, nutritional habits and menstrual characteristics; views about menstruation and complaints in the premenstrual period were examined. The 3 questions in the second part were asked to those who had one or more of the indications and characteristics, and the effect of bleeding on their daily life was questioned.

Menstrual Distress Complaint List

It is a measure developed by Rudolf H. Moos by application to 839 women in 1968 (4). It was adapted to the Turkish society by Kızılkaya in 1992 (5). In terms of reliability, internal consistency was obtained by applying it twice to 30 students who were educated at Istanbul University Florence Nightingale School of Nursing, and reliability coefficients were found to be 0.71 and 0.97, respectively. All r values were found to be extremely statistically significant (p < 0.001).

In the Menstrual Distress Complaint List, 47 complaints were individually interrogated for menstrual, premenstrual and intermenstrual periods. Complaints in the Menstrual Distress Complaint List were listed under 8 subgroups, including pain (muscle stiffness, headache, stomach cramps, backache, fatigue, general aches), water retention (weight gain, skin disorders, pimples, breast tenderness, swelling in breasts and stomach), autonomic reaction (dizziness, faintness, cold sweats, nausea, vomiting, hot flashes), negative affectivity (loneliness, anxiety, mood swings, crying, restlessness, irritability, depression and sadness, hyperactivity), impaired concentration (insomnia, forgetfulness, confusion, lowered judgement, difficulty in concentrating, tension, little accidents due to carelessness, lowered motor coordination), behavioural changes (lowered school or work performance, taking naps; staying in bed, staying at home, avoiding social activities, decreased efficiency), arousal (affectionate, orderliness, excitement, feelings of well-being, bursts of energy, activity) and control (feeling of suffocation, chest pains, ringing in the ears, palpitation, numbness and tingling in extremities, blind spots, fuzzy vision, sensory disturbances). Increased appetite was not included in any group (6).

Statistical analysis

The sociodemographic data of the participants and the data of the questionnaire forms were evaluated using SPSS for Windows 20.0 statistics software. Descriptive statistics are given as mean ± standard deviation for continuous variables and as number and percentage for categorical variables. Normal distribution of data was examined by the Kolmogrov–Smirnov test. Comparison of the groups (PMS Yes-No) was performed using Mann–Whitney U

test. The statistical significance of the changes in the Menstrual Distress Complaint List subscales within 3 periods was analysed using the Freidman test. Differences between the groups were compared using two-way Wilcoxon test and assessed using Bonferroni correction. The level of statistical significance was set at a p value of <0.05.

Results

The mean age of the participants (n = 286) in this study was 20.67 ± 1.91 years, the mean height was 164.63 ± 5.93 cm and the mean weight was 57.28 ± 8.33 kg. The mean age of the participants at the first menstrual period was 13.07 ± 1.19 years. It was observed that the mean age at the first menstrual period of PMS participants was significantly lower than that of non-PMS participants (Table 1).

Table 1. Comparison of some measures of the participants with and without PMS

	PMS		P
	Yes (n = 54) Mean±SD	No (n = 232) Mean ±SD	
BMI (kg/m2)	20.73 ± 3.19	21.16 ± 2.93	0.959
Age (year)	20.98 ± 2.00	20.60 ± 1.89	0.173
Height (cm)	162.56 ± 16.19	164.69 ± 6.05	0.934
Weight (kg)	55.93 ± 10.97	57.38 ± 8.41	0.707
Age at first menstrual period (year)	12.56 ± 1.98	13.14 ± 1.14	0.019
Length of menstrual flow (day)	6.02 ± 1.62	5.93 ± 1.34	0.846

Abbeartions: BMI : (Body mass index) SD: standard deviation, : p < 0.05,

The mean duration of the menstrual period was 5.94 ± 1.39 days. The premenstrual complaints started approximately 4.16 ± 2.57 days before and disappeared 2.52 ± 1.74 days after the onset of bleeding.

When it was investigated whether the participants had knowledge about this subject before their first menstrual period, it was observed that 89.9% of them had knowledge, and when they were asked from whom they obtained that knowledge, 64% of them answered 'family'. When they were asked about their thoughts of the menstrual period, it was found that 78% of them thought it was a natural and physiological process. Among those who thought that it was a natural and physiological process, the rate of those participants who did not have PMS was found to be significantly higher than that of those with PMS. Among those who thought that menstruation was one of the most important factors negatively affecting life, the rate of those participants with PMS was found to be significantly higher than that of those who did not have PMS (p < 0.05).

When eating habits were examined, it was observed that 43% of the participants regularly consumed 3 main meals and plenty of vegetables every day and 33.2% consumed 3 or more cups of tea/coffee per day. It was observed that among those who consumed 3 or more cups of tea/coffee per day, the rate of women with PMS was significantly higher than that of those who did not have PMS (p < 0.05). The rate of those who smoked was 3.8%, and the rate of those who exercised 2–3 days a week was 11.9%.

With respect to the factors that could cause social discomfort before menstruation, 53.8% indicated sleep disorders (Figure 1). When the symptoms that the participants had within a week before menstruation were investigated, it was found that 66.8% of them had physical symptoms and 55.2% of them had emotional fluctuations (Figure 2).

When the menstrual cycles in the last one year were considered, the rate of participants who said that complaints generally occurred was 69.9% (n = 200). The rate of participants who stated that these symptoms caused a serious problem in daily, school, work or social activities was 30.8% (n = 88). According to the analysis based on the diagnostic criteria, PMS was present in 18.9% of the participants (n = 54).

It was found that the rate of PMS was significantly higher in women with marital conflict, legal problems and attempted suicide (p < 0.05).

The frequency of complaints in the Menstrual Distress Complaint List was compared between 3 groups: 1 week period before menstruation, menstruation period, and other days. The complaints with a statistical difference between the participants with PMS and without PMS are shown in Table 2 with the sign '✓'.

Table 2. Periodical changes between the participants with and without PMS in terms of complaints

Complaints	1 week before the last menstrual period	During the last menstrual period	Other days
1. Weight gain	x	x	X
2. Insomnia	✓	x	X
3. Crying	✓	✓	X
4. Lowered school or work performance	✓	✓	x
5. Muscle stiffness	x	x	x
6. Forgetfulness	✓	x	x
7. Confusion	✓	✓	x
8. Taking naps, staying in bed	✓	x	✓
9. Headache	✓	x	x
10. Skin disorders	✓	x	x
11. Feeling of loneliness	✓	x	x

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12. Feeling of suffocation	✓	✓	x
13. Affectionate	✓	✓	✓
14. Orderliness	x	x	x
15. Staying at home	✓	✓	x
16. Stomach cramps	✓	x	x
17. Dizziness, faintness	✓	✓	x
18. Excitement	✓	x	x
19. Chest pains	✓	x	✓
20. Avoiding social activities	✓	✓	x
21. Anxiety	✓	✓	x
22. Backache	✓	x	x
23. Cold sweats	✓	x	x
24. Lowered judgement	✓	✓	x
25. Fatigue	✓	✓	x
26. Nausea, vomiting	✓	✓	✓
27. Restlessness	✓	✓	✓
28. Hot flashes	✓	x	x
29. Difficulty in concentrating	✓	✓	x
30. Pain and tenderness in breasts	✓	x	x
31. Feelings of well-being	✓	✓	✓
32. Ringing in the ear	✓	✓	x
33. Tension	✓	x	✓
34. Swelling	✓	x	✓
35. Accidents	✓	✓	x
36. Irritability	✓	x	x
37. General aches and pains	✓	x	x
38. Mood swings	✓	x	✓
39. Palpitation	✓	x	x
40. Depression	✓	x	x
41. Decreased efficiency	✓	✓	x
42. Lowered motor coordination	✓	x	✓
43. Numbness and tingling in extremities	✓	x	x
44. Increased appetite	✓	x	x
45. Tension	✓	✓	✓
46. Blind spots, fuzzy vision	✓	✓	x
47. Burst of energy, activity	x	x	x

It was examined whether there was a difference between the Menstrual Distress Complaint List subscale averages for the three periods. According to this, it was observed that there was a significant difference between control, arousal, behavioural changes, concentration, negative affectivity, autonomic reaction, water retention and pain subscale averages during 1 week before the last menstrual period ($p < 0.05$). It was found that during the last menstrual period, there was a statistically significant difference between control, behavioural changes, concentration, negative affectivity and autonomic reaction subscale averages ($p < 0.05$). On the other days, a statistically significant difference was found between negative affectivity and water retention subscale averages ($p < 0.05$). Negative affectivity was the most common complaint in all periods (Table 3). It was investigated whether there was any difference in the Menstrual Distress Complaint List subscale averages between the 3 periods. According to this, it was found that there was a significant difference between the measurement averages taken in the 3 periods in terms of control, behavioural changes, concentration, negative affectivity, autonomic reaction, water retention and pain subscales ($p < 0.05$). There was no statistically significant difference in the arousal subscale when the averages were compared between each period (Figure 3)

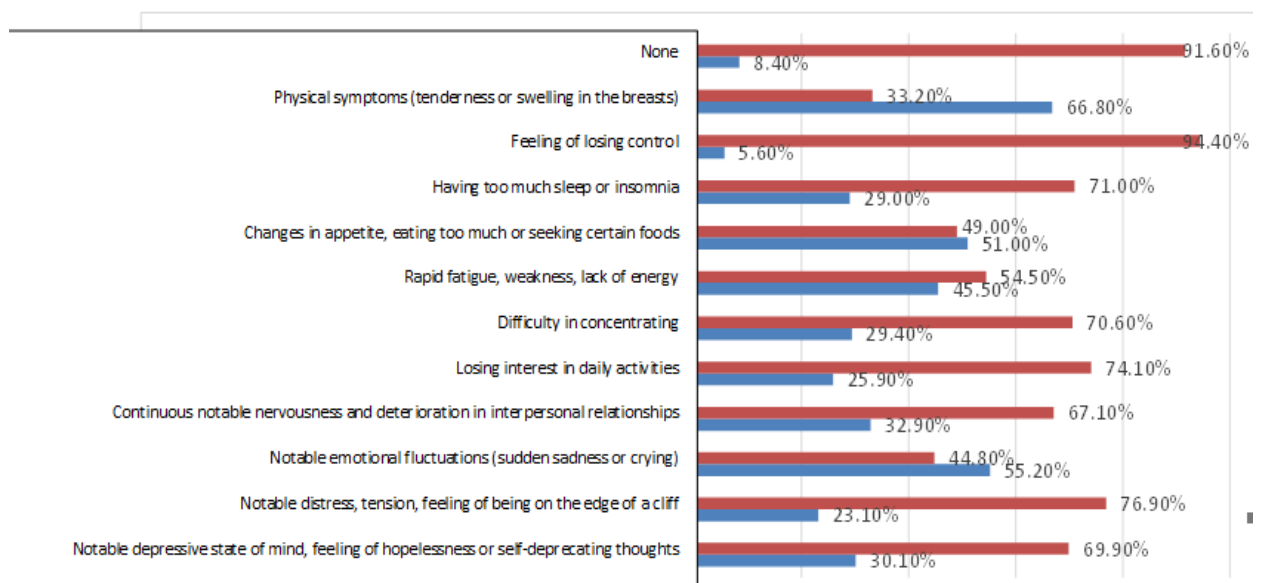**Table-3. Comparison of the Menstrual Distress Complaint List subscales in participants with and without PMS**

		PMS		
		Yes (n = 54) Mean ±SD	No (n = 232) Mean±SD	P
Other Days	**Control**	0.91±2.03	0.54±1.72	0.124
	Arousal	2.02±3.59	1.14±2.42	0.135
	Behavioural Changes	0.78±1.72	0.57±1.59	0.342
	Impaired concentration	2.30±3.61	1.49±2.88	0.173
	Negative Affectivity	2.24±3.49	1.62±3.59	0.046[*]
	Autonomic Reaction	0.35±0.97	0.29±0.92	0.495
	Water Retention	1.04±1.64	0.63±1.49	0.046[*]
	Pain	1.33±2.46	1.02±2.20	0.358
During the Last Menstrual Period	**Control**	2.52±3.52	1.31±2.53	0.012[*]
	Arousal	1.37±2.22	1.10±2.18	0.184
	Behavioural Changes	5.31±5.67	2.85±3.89	0.003[*]
	Impaired concentration	4.89±5.86	2.57±4.22	0.001[*]

	Negative Affectivity	7.81±7.66	4.46±5.69	0.003*
	Autonomic Reaction	2.83±3.37	1.34±2.59	0.001*
	Water Retention	3.41±3.36	2.64±2.86	0.180
	Pain	6.30±5.86	5.03±4.80	0.221
During 1 week Before the Last Menstrual Period	Control	3.78±3.27	1.31±2.40	0.001*
	Arousal	2.17±3.06	1.02±1.99	0.004*
	Behavioural Changes	4.76±4.40	1.60±2.76	0.001*
	Impaired concentration	6.91±7.45	2.44±3.96	0.001*
	Negative Affectivity	11.76±7.94	4.68±5.81	0.001*
	Autonomic Reaction	3.15±3.59	0.77±1.79	0.001*
	Water Retention	6.11±3.62	3.49±3.08	0.001*
	Pain	6.69±5.23	3.44±3.65	0.001*

Abberations: SD: standard deviation. *: p < 0.05, Mann–Whitney U Test was used.
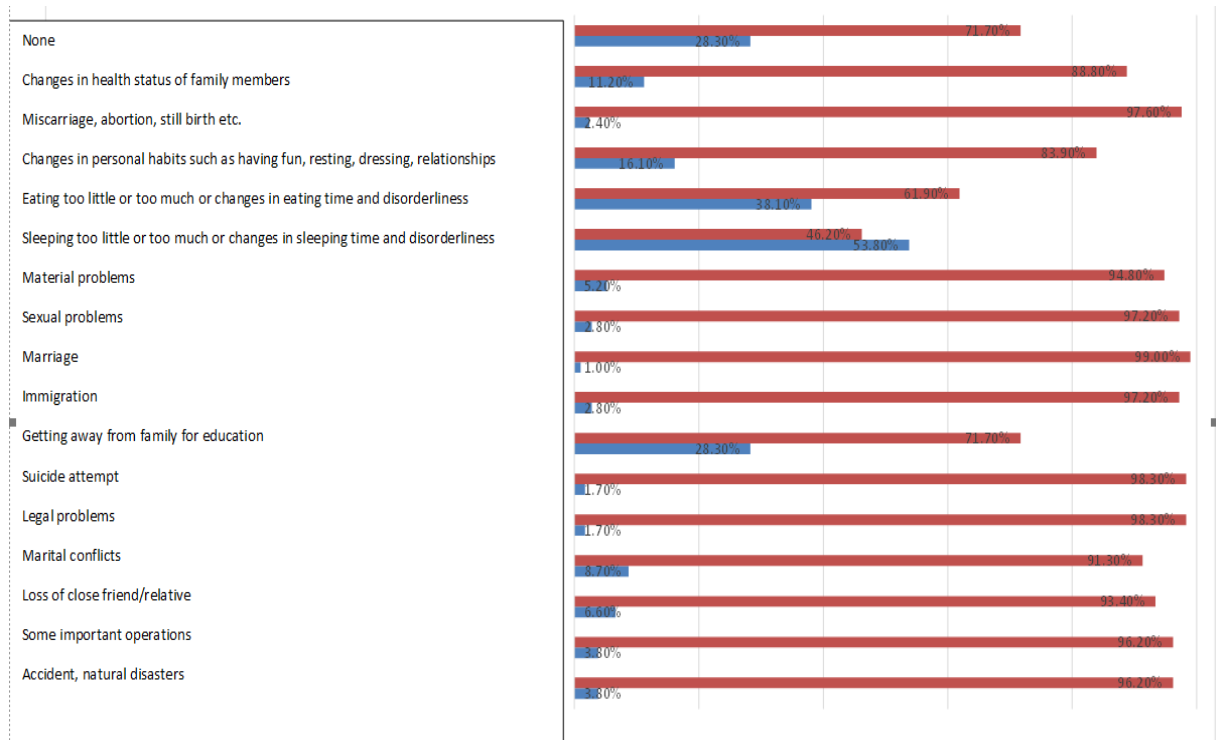
Figure 1. Various factors that might lead to premenstrual disturbances

Figure 2. Symptoms that occurred during 1 week before the menstrual period
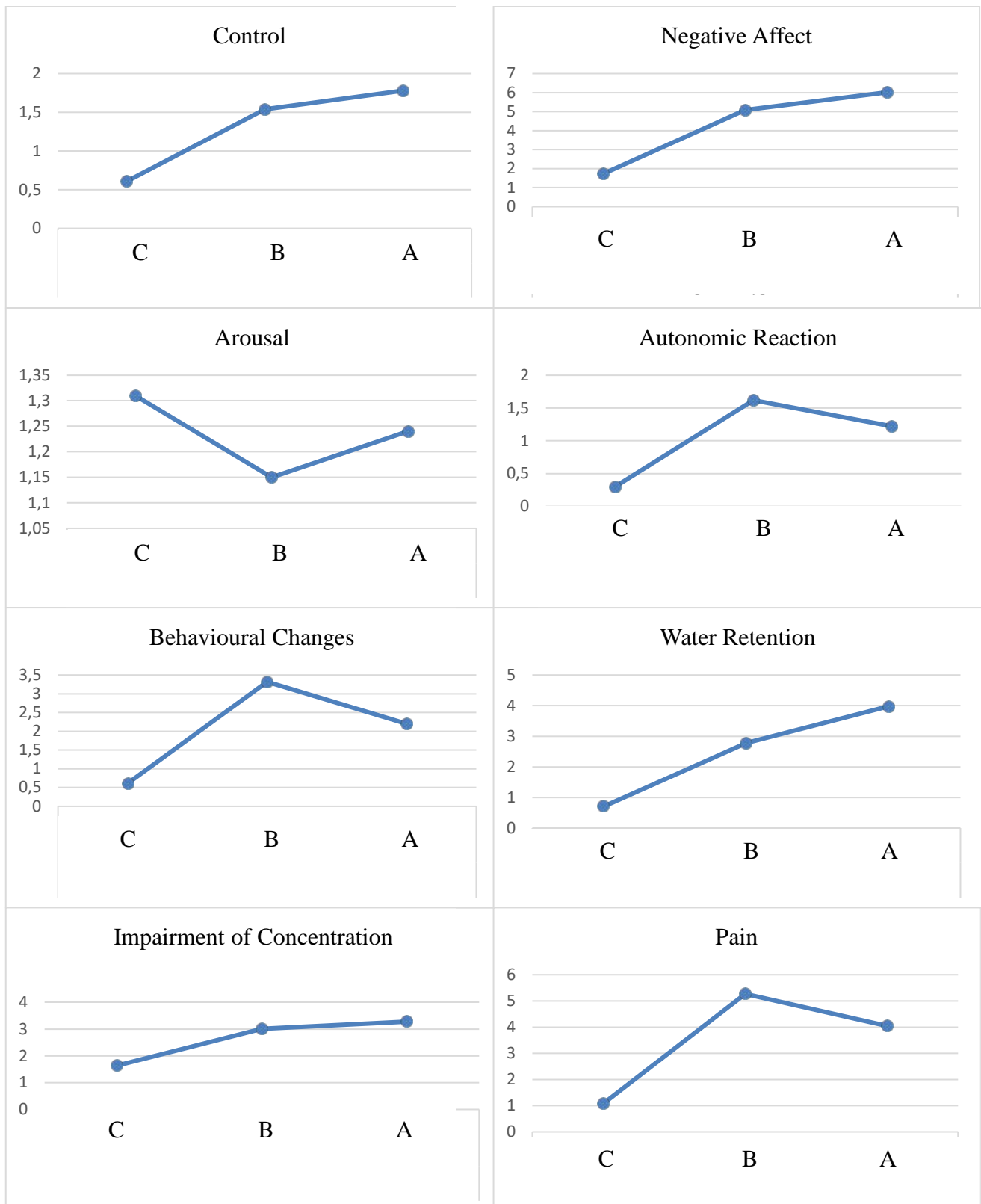
Figure 3. Comparison of the Menstrual Distress Complaint List Subscale Averages between Periods

A: One week before the last period, B: During the last period, C: Other days

Discussion

In the present study, a significant health problem was analysed via a specific group. PMS is common in women of reproductive age, particularly in young women. For a woman who menstruates approximately 12 times a year every year, there is a difficult period of 7–10 days every month, which corresponds to a total period of 3–4 months per year (approximately 25%–30% of the year).

Recent studies on PMS have been conducted mostly in Asia, and the prevalence of PMS has been found in a very wide range in these studies. Prevalence studies conducted in Turkey, India, Pakistan, the Arabian Peninsula and Taiwan have presented results in the range of 30%–80% (7-11). Comparing with these rates, in the present study, we obtained a much lower prevalence. Cheng et al. found no difference between PMS and non-PMS participants in terms of mean age and BMI (11). In the study by Alpaslan, there was no significant difference in age, BMI, first menstrual period and duration of menstruation between PMS and non-PMS participants (12). In our study, there was no significant difference in the means of BMI, age, height, weight and menstrual duration based on the presence or absence of PMS in women. However, it was observed that the mean age at the first menstrual period of PMS participants was significantly lower than that of non-PMS participants.

In a study by Masho et al., It was found that obese women have 2.8 times more risk for PMS than women of normal weight (13). Ellen also stated that obesity is a risk factor for PMS (14). In our study, the number of obese participants was not an ideal number to be compared with the duration of the menstrual cycle.

Studies conducted with women in different cultures have shown that social and cultural factors, activity status and stress play important roles in the development of premenstrual symptoms (15). Women who work or have a responsibility in the society feel themselves under more societal oppression, and for this reason, they experience more mental troubles. It is known that academic stress and intensive training in medical facilities exacerbate PMS (16). All the participants in our study were college students in accordance with the methodology. Despite this, the rates we obtained were below those reported in the literature based on the level of education comparisons.

Restriction of chocolate, cola, coffee, alcohol, nicotine, red meat and food containing sugar and salt is recommended in patients with PMS (17). Cohen et al. reported that the prevalence of premenstrual symptoms is higher in people who smoke more than 4 times a day (18). In another study, it was reported that those who consumed 3 or more cups of tea/coffee a day had 1.9 times more pain symptoms than those who consumed 1–2 cups (19). In our study, it was observed that there was a statistically significant difference between the levels of tea/coffee consumption and PMS, and among people who consumed 3 or more cups of tea/coffee, this difference was significantly higher in those with PMS than those without PMS. Caffeine by changing the levels of estrogen, testosterone and progesterone is known to have a ground preparatory effect on PMS (20,21). In our target group, we found that the smoking rate in the participants with PMS was significantly lower than the average smoking rate of the country. Nevertheless, it should be noted that smoking should be restricted in order to reduce PMS symptoms (2).

Although most women with PMS have only a few of the identified symptoms, almost every woman with PMS has experienced all of these complaints. For example, it is possible that a patient only experiences anxiety and this symptom typically ends within a few days from the onset of menstruation (22,23). Adıgüzel et al. reported that the most common PMS symptoms are nervousness and restlessness (24). In the study by Demir et al., the most common PMS symptoms were back pain and restlessness (2).

The most common PMS symptoms in the study by Pinar were back pain, stress, anger and tenderness and swelling in breasts (7). In our study, the women's monthly cycles were assessed in 3 periods: '1 week before the last menstrual period', 'during the last menstrual period' and 'other days'. Among the complaints included in the Menstrual Distress Complaint List, the most frequent complaint in participants with PMS was anxiety during 1 week before the last menstrual period, stomach cramps during the last menstrual period and skin disorders during the other days. In participants without PMS, the most common complaint was skin disorders during 1 week before the last menstrual period, stomach cramps during the last menstrual period and insomnia during the other days. In the comparison of complaints of the participants with and without PMS based on the subscales, all the symptoms in the Menstrual Distress Complaint List were statistically significantly higher in the participants with PMS during 1 week before the last menstrual period. During the last menstrual period, there were statistically significantly more complaints among those with PMS in the control, behavioural changes, concentration, negative affectivity and autonomic reaction subscales. On the other days, there were statistically significantly more complaints among those with PMS in the negative affectivity and water retention subscales. As can be seen, the negative affectivity subscale (loneliness, anxiety, mood swings, crying, restlessness, irritability, depression-sadness, hyperactivity) manifested itself every day more frequently in the participants with PMS than in those without PMS.

According to a population-based study conducted in 2010 with 4,085 women aged 14–50 years living in France, Germany, Hungary, Italy, Spain, the United Kingdom, Brazil and Mexico, physical and mental complaints observed in patients with PMS were reported to negatively affect women's daily lives significantly (25). In our study, 25.9% of the participants with PMS considered menstruation as one of the most important events that negatively affects life. The same answer was given by only 2.6% of those without PMS.

Because the participants diagnosed with PMS in the present study were students of a medical faculty of one university only, the results may not be generalised to people of all ages, education levels and geographical areas. Because the scales evaluating complaints of individuals were not supported by biochemical measurements, the inferences were based on verbal expressions.

Conclusions

The need to use health care services for PMS has been gradually increasing. The number of applications to clinics with PMS-associated complaints has been increasing. Physicians play an important role in the process from the onset of

associated complaints to the diagnosis of PMS. Preventing women, and therefore families, from living with biopsychosocial problems will be possible by the diagnosis of the disorder and the provision of treatment.

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