



Frequency and Affecting Factors of Premenstrual Syndrome Among Turkish Female University Students

Üniversite Öğrencilerinde Premenstrüel Sendrom Sıklığı ve Etkileyen Faktörler

Frequency of Premenstrual Syndrome

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Öz

Amaç: Premenstrüel sendrom (PMS) adet döngüsünün luteal evresi sırasında sıklık olarak görülen adet kanamasının başlanması ile birkaç gün içinde kaybolan fiziksel, bilişsel, duygusal ve davranışsal semptomlar bütünüdür. **Gereç ve Yöntem:** Kesitsel tipteki bu araştırma Necmettin Erbakan Üniversitesi Meram Tıp Fakültesi 2014-2015 yıllarında eğitim ve öğrenim gören 403 kız öğrencide yapılmıştır. Çalışmaya katılan öğrencilerin ve annelerinin menstrüel dönem özellikleri ile sosyodemografik bilgileri araştırmacılar tarafından önceden hazırlanmış olan bir forma kaydedildi. PMS varlığı ve semptomların şiddetini belirlemek için premenstrüel sendrom ölçeği kullanıldı. Veriler SPSS 20.0 istatistik paket programında değerlendirildi. **Bulgular:** Çalışmaya katılan öğrencilerin yaş ortalaması 20,67±1,95 yaş (18-27) idi. Premenstrüel Sendrom Ölçeğinin toplam puan ortalaması 105,97±30,45 (44-194) idi. PMS varlığı ile menstrüasyon özellikleri karşılaştırıldığında; yaş ($p=0,037$), ve menstrüasyon süresi ($p=0,016$) ile PMS varlığı arasında istatistiksel olarak anlamlı bir ilişki bulundu. PMS toplam puanı ile yorgunluk, sinirlilik ve depresif düşünceler arasında sırasıyla pozitif yönde çok yüksek derecede korelasyon saptandı ($r=0,826$, $r=0,788$, $r=0,833$ $p<0,000$) Tartışma: Bu çalışmada, üniversite öğrencilerinde PMS puan ortalamaları yüksek bulundu. Üniversite öğrencilerinde yaygın olarak görülen Premenstrüel sendroma yönelik farkındalığın artırılmasına çaba harcanmalı ve öğrencilere baş etmede kullanılabilecek yöntemlerin öğretilmesine yönelik girişimler planlanmalıdır.

Anahtar Kelimeler

Premenstrüel Sendrom; Üniversite Öğrencisi; Premenstrüel Sendrom Ölçeği

Abstract

Aim: Premenstrual syndrome (PMS) refers to physical, cognitive, affective, and behavioral symptoms that occur cyclically during the luteal phase of the menstrual cycle and resolve quickly at or within a few days of the onset of menstruation. **Material and Method:** This cross-sectional study was conducted among 403 female students attending education and training in Necmettin Erbakan University (NEU) Meram Medical Faculty for three months in 2014-2015. The questionnaire included items on students sociodemographic and menstrual pattern characteristics, concerning their age at menarche, menstrual cycle length, and regularity. The menstrual period properties of their mothers were recorded on a pre-prepared form by the researchers. Premenstrual syndrome scale (PMSS) was used to define the severity of symptoms and the presence of PMS. **Results:** The mean age of the students who participated in the study was 20.67±1.95 (18-27 years). The mean score of Premenstrual Syndrome Scale was 105.97±30.45 (44-194). The frequency of PMS was found as 56.6% in this study. When PMS and menstrual features were compared, there was a statistically significant relationship between age ($p=0.037$), duration of menstruation ($p=0.016$), and the presence of PMS. Positive direction and very high correlation was found between PMS total score and fatigue, irritability, and depressive thoughts ($r=0.826$, $r=0.788$, $r=0.833$ $p<0.000$), respectively. **Discussion:** In this study, the mean score of PMS was high among the university students. Efforts should be made to increase the awareness of premenstrual syndrome among university students and educate them about how to cope with it.

Keywords

Premenstrual Syndrome; University Students; Affecting Factors; Premenstrual Syndrome Scale

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Introduction

The menstrual cycle that generates the luteal phase of the menstrual cycle and entails physical, cognitive, emotional and behavioral changes before the start of menstruation is defined as premenstrual syndrome (PMS) [1,2]. Although the etiology of PMS is not completely known, symptoms are generally subjective and it is commonly seen in young and middle-aged women. Menstruation, understood as a symbol of female fertility, is a physiological event typically occurring over 30-35 years. Thus, the symptoms of PMS affect a significant portion of a woman's life. PMS includes a number of signs and symptoms that resolve with the start of menstruation, the most important of which are mood and behavioral changes. The most frequent mood symptoms are sensitivity, depression, tenseness, irritability, anxiousness, instability, decrease in attention, dysmnnesia, and sleeping disorder. The most frequent physical symptoms are breast tenderness, excessive desire for specific foods, acne, oedema, pain, and fatigue [3]. Although these symptoms are seen in 80% of women, only in 5-10% do they affect the quality of life and require treatment [4]. In studies done in Turkey the prevalence of PMS in women aged 15-49 has been found as ranging between 5.9-76.0% [5]. Epidemiology, etiology, and pathophysiology of PMS is not completely understood. In the literature, the following are thought to play a role in PMS symptoms:

- Oestrogen-progesterone imbalance,
- Decrease of progesterone level in the luteal phase,
- Prolactin and renin- angiotensin- aldosterone imbalance,
- Calcium and magnesium shortage in diet,
- Vitamins,
- Psychosocial factors,
- Genetic factors.

However, some previous studies have reported factors including not only hormonal changes but also the culture that an individual lives in, the work status and educational background condition of her mother, and experiencing menstrual problems such as dysmenorrhea.

This study was performed to determine the affecting factors and frequency of premenstrual syndrome (PMS) in female students in a medical faculty, and to provide more information about PMS to those requiring it.

Material and Method

Study design, setting, and population

This descriptive and cross-sectional study was performed between 20th December 2015- 20th March 2016. The study universe was all female students (530 girls) educated in NEU, Meram Medical Faculty during this period.

Ethical Approval of Study

Ethical approval of research was received from NEU Meram Medical Faculty ethical committee with a number 2015/395 on 18.12.2015. The volunteers who participated were informed about the study and gave both oral and written approval.

Data collection

The sociodemographic data and menstrual period properties of the mothers of participating students were recorded on forms that were prepared beforehand by the researchers in line with

the literature findings. This form included the person's age, the place where she spent most of her life, her menarche age and pattern, presence of dysmenorrhea, smoking status, diagnosed diseases, and the education and menstrual period properties of her mother. In order to ascertain the presence of PMS and the severity of symptoms, the Premenstrual Syndrome Scale (PMSS) was used.

Premenstrual Syndrome Scale (PMSS)

In order to measure premenstrual symptoms and ascertain their severity, a scale was developed, and its validity and reliability studied, by Gencdogan [6]. It consists of 44 items of the 5-point Likert type. The Chronbach alpha coefficient of the scale was found as 0.7. The scale has nine subdimensions: Depressive mood, anxiety, fatigue, irritability, depressive thoughts, pain, appetite changes, sleeping changes, and puffiness. The lowest and the highest points that can be obtained from each subdimension respectively are for depressive mood 7-35, anxiety 7-35, fatigue 6-30, irritability 5-25, depressive thought 7-35, pain 3-15, appetite change 3-15, sleeping change 3-15, and puffiness 3-15. "PMSS total points" is obtained by adding of points obtained from subdimensions. The lowest total that can be obtained from the scale is 44 and the highest is 220. The high point shows the intensity of PMS symptoms. Thus, according to the cutoff point of the PMS scale, ≤ 110 points was evaluated as absence of PMS, with ≥ 111 points indicating the presence of PMS [6].

Statistical Analysis

The study data were statistically analyzed using SPSS (Statistical Package for Social Sciences) for Windows 20.0. Frequencies, average, standard deviation, median, minimum and maximum values, and odds ratios were calculated. The Chi-square test was used to compare qualitative data. Conformity to normal distribution was evaluated using the Kolmogorov-Smirnov test. The differences between averages were obtained using the Student t-test, Mann-Whitney U, and Kruskal Wallis variance analysis. The significance level was accepted as $p < 0.05$.

Results

The participation rate of study was 76.1% (403/530) that excludes those who did not give their consent and who were absent. The mean age of the 403 participating females was 20.67 ± 1.95 years (18-27). The mean age of first menstruation was 13.07 ± 1.07 (10-17) years, average cycle length was 28.31 ± 3.82 (19-45) days, average length of menstruation was 6.18 ± 1.37 (2-10) days, and number of pads used daily during the menstruation period was 3.08 ± 1.20 (1-9) pads.

Of the students, 70.7% (n=285) lived in the city centre whereas 23.1% (n=93) were living in the county, 2.2% of the students (n=9) were smokers. 11.7% (n=47) had previous diagnosed disease; of these, 2.7% (n=11) had psychiatric disease, 4.2% (n=17) had polycystic ovary syndrome, 2.7% (n=11) had anemia, and 2.7% (n=11) had thyroid disease. Regarding their menstruation pattern, 78.4% of students stated that they had regular menstruation, 63.0% had painful menstruation and 32.8% stated that they take pain pills, whereas 24.6% of them rested in order to lessen pain. 3.2% of participants had a previous PMS

diagnosis and 2.5% had treatment for PMS. The complaints due to the menstruation period affected the social life of 32.3% of students, school attendance of 22.3%, and daily life of 37.0%. Of the students, 26.6% stated that their complaints recovered with the start of menstruation whereas 11.4% of them had to apply to a healthcare centre (Table 1).

26.8% of participants had similar symptoms to their mothers and 15.4% had similar symptoms in their siblings, whereas 47.1% had no symptoms in their families. The mothers of 24.8% of students were university graduates, 21.1% were high school graduates, and 31.3% were primary school graduates. 49.9% of students got their first knowledge about menstruation from their mothers and 66.7% of them defined menstruation as “hormonal balance and being healthy” (Table 2).

According to the PMS cutoff point of the PMSS, 56.6% of participants had PMS. When PMSS scores of the students were compared to menstruation properties, there was a statistically significant relation between length of menstruation and PMSS average points ($p=0.009$). When we compared presence of PMS with menstrual features, we found a statistically significant relation between PMS and age ($p=0.037$) and between PMS and length of menstruation ($p=0.016$). There was a higher frequency of PMS in those with a cycle length of 29 days or more, and in those age 20 or less. There was no statistically significant relation between PMS and menarche age, cycle length, number of pads used, and smoking status ($p>0.05$) (Table 3).

We found that 59.6% of students complained of depressive mood, 19.9% of anxiety, 58.1% of fatigue, 52.1% of irritability and puffiness, 35.0% of depressive thoughts, 50.9% of pain, 62.3% of appetite changes, and 45.2% of sleeping changes (Table 4). The correlation between PMSS total points and those of the subdimensions of the scale is shown in Table 5. Very high correlation in the positive direction was found between PMSS total points and fatigue ($r=0.826$), depressive thoughts ($r=0.833$), and irritability ($r=0.788$) ($p<0.000$).

Discussion

PMS, seen in the luteal phase of the menstrual cycle, involves cognitive and emotional disorders that recover with the start of menstruation. According to the American Obstetric and Gynecologists Association, in order to diagnose PMS, symptoms should be seen within 5 days before the start of menstruation and finish within 4 days after the start of menstruation [7]. In studies done previously it has been reported that professional effectiveness of women decreases, and the studying capacities, family relations and school performances of adolescent girls are seriously affected due to premenstrual complaints [8].

PMS symptoms can start at any age after menarche. In Turkey, the age of menarche is between 11-16, with a mean age of 13 year [9]. In our study, the mean age of first menstruation was 13.07 ± 1.07 (10-17) years. Of the participants, 66.5% expressed that cold weather increased their premenstrual complaints and 15.9% of them expressed that family problems increase complaints. In a study by Erbil et al. of 302 married women, half (53.2%) stated that their complaints before menstrual period increase when they are exposed to cold and 27% of them stated that their complaints before menstrual period increase when they have family problems [10].

In the studies done in our country, it was found that the frequency of PMS ranges between 5% and 79%. PMS was found in 42.7% of adolescents in Ince’s study, and in 57.4% of university students in Kisa’s study, while Kircan et al. reported that 60.1% of nursingstudents had PMS, respectively [11-13]. In our study, in accordance with the literature, PMS was determined in 56.6% of medical faculty students. The frequency of PMS has been found between 14% and 43% in American adolescents [14]. In a study done in England with 974 adult women aged between 20-34, the frequency of PMS was defined as 24% in England [15]. This difference can be attributed to the use of nonstandard scales for research and also by the varying

Table 1. Menstruation features of the participants

| | n | % | |
|---|-------------------|-----|------|
| Painful menstruation | Yes | 254 | 63.0 |
| | No | 149 | 37.0 |
| Methods of reducing pain | Taking pain pill | 132 | 32.8 |
| | Resting | 99 | 24.6 |
| | Hot applications | 55 | 13.6 |
| | Not to use method | 117 | 29.0 |
| Menstrual regulation | Regular | 316 | 78.4 |
| | Irregular | 87 | 21.6 |
| Previously received the diagnosis of PMS | Yes | 13 | 3.2 |
| | No | 390 | 96.8 |
| Have been treated for PMS | Yes | 10 | 2.5 |
| | No | 393 | 97.5 |
| Does PMS affect social activity? | Yes | 130 | 32.3 |
| | No | 273 | 67.7 |
| Discontinuous school attendance | Yes | 90 | 22.3 |
| | No | 313 | 77.7 |
| Does PMS affect daily work? | Yes | 149 | 37.0 |
| | No | 254 | 63.0 |
| Have PMS complaints recovered with the beginning of menstruation? | Yes | 107 | 26.6 |
| | No | 296 | 73.4 |
| Applying to a health care provider | Yes | 46 | 11.4 |
| | No | 357 | 88.6 |

Table 2. Familial menstruation characteristics of the participants

| | | n | % |
|--|------------------|-----|------|
| Do you have any PMS in family? | Mother | 108 | 26.8 |
| | Aunt | 33 | 10.7 |
| | Sister | 62 | 15.4 |
| | Nobody | 190 | 47.1 |
| Does one’s mother have painful menstruation? | Yes | 168 | 41.7 |
| | No | 235 | 58.3 |
| Students got their first knowledge about menstruation from whom? | Mother | 201 | 49.9 |
| | Sister | 33 | 8.2 |
| | Friends | 29 | 7.2 |
| | Teacher | 51 | 12.7 |
| | Health staff | 58 | 14.4 |
| Factors that increase the PMS | Nobody | 31 | 7.7 |
| | Cold weather | 268 | 66.5 |
| | Family problems | 64 | 15.9 |
| | Hot weather | 27 | 6.7 |
| | Friends problems | 27 | 6.7 |
| | Nothing | 17 | 4.2 |

Table 3. Comparison with PMS and menstrual characteristics of the participants

| | | ≤110 points PMS absent | | ≥111 points PMS present | | x2 | p |
|-------------------------------|------------|---------------------------|------|----------------------------|------|-------|-------|
| | | n | % | n | % | | |
| Age (Year) | ≤20 years | 109 | 47.8 | 102 | 58.3 | 4.358 | 0.037 |
| | ≥21 years | 119 | 52.2 | 73 | 41.7 | | |
| First menstrual age (Year) | ≤13 years | 149 | 65.4 | 123 | 70.3 | 1.099 | 0.294 |
| | ≥14 years | 79 | 34.6 | 52 | 29.7 | | |
| Length of cycle (Day) | ≤6 days | 124 | 54.4 | 97 | 54.4 | 0.043 | 0.835 |
| | ≥7 days | 104 | 45.6 | 78 | 44.6 | | |
| Length of menstruation (Days) | ≤28 days | 147 | 64.5 | 92 | 52.6 | 5.812 | 0.016 |
| | ≥29 days | 81 | 35.5 | 83 | 47.4 | | |
| Number of pads used | ≤3 pads | 165 | 72.4 | 121 | 69.1 | 0.500 | 0.480 |
| | ≥4 pads | 63 | 27.6 | 54 | 30.9 | | |
| Smoking status | Smoker | 5 | 2.2 | 4 | 2.3 | 0.004 | 0.950 |
| | Non-smoker | 223 | 97.8 | 171 | 97.7 | | |

Table 4. Distribution of premenstrual complaints of the female university students

| PMS subscales | n | % |
|----------------------------------|-----|------|
| Depressive mood (≥18 points) | 240 | 59.6 |
| Anxiety (≥18 points) | 80 | 19.9 |
| Fatigue (≥16 points) | 234 | 58.1 |
| Irritability (≥13 points) | 210 | 52.1 |
| Depressive thoughts (≥17 points) | 141 | 35.0 |
| Pain (≥8 points) | 205 | 50.9 |
| Appetite changes (≥8 points) | 251 | 62.3 |
| Sleep changes (≥8 points) | 159 | 39.5 |
| Swelling (≥8 points) | 182 | 45.2 |
| PMS (≥111 points) | 228 | 56.6 |

Table 5. Correlation between PMS total points of students and sub dimensions of scale

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| 1. Depressive mood | 1 | | | | | | | | | |
| 2. Anxiety | 501** | 1 | | | | | | | | |
| | .000 | | | | | | | | | |
| 3. Fatigue | 575** | 498** | 1 | | | | | | | |
| | .000 | .000 | | | | | | | | |
| 4. Irritability | 585** | 442** | 588** | 1 | | | | | | |
| | .000 | .000 | .000 | | | | | | | |
| 5. Depressive thoughts | 602** | 619** | 631** | 600** | 1 | | | | | |
| | .000 | .000 | .000 | .000 | | | | | | |
| 6. Pain | 356** | 337** | 532** | 437** | 407** | 1 | | | | |
| | .000 | .000 | .000 | .000 | .000 | | | | | |
| 7. Appetite changes | 288** | 138** | 371** | 373** | 280** | 331** | 1 | | | |
| | .000 | .005 | .000 | .000 | .000 | .000 | | | | |
| 8. Sleep changes | 386** | 451** | 485** | 405** | 498** | 426** | 235** | 1 | | |
| | .000 | .000 | .000 | .000 | .000 | .000 | .000 | | | |
| 9. Swelling | 332** | 261** | 430** | 472** | 353** | 406** | 330** | 286** | 1 | |
| | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | | |
| 10. PMS total points | 779** | 711** | 826** | 788** | 833** | 619** | 481** | 628** | 569** | 1 |
| | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | |

*Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

characteristics of study participants, such as age, profession, education level, and sect. Abdelmoty et al. declared that dysmenorrhea was the most prevalent (93%) menstrual disorder, followed by PMS (65%) and abnormal cycle lengths (43%), in their study of secondary school adolescents in Egypt [16].

In the study of students of the Marmara University Medical Faculty it was found that the most frequent physical complaints were tightness and puffiness in the stomach and the most frequent psychological complaint was irritability [17]. In a study done in Iran the most frequent complaints in the premenstrual period were anxiousness, pain and puffiness in the breasts, increased appetite, and dermatological changes [18]. In our study, the most frequent complaints in the premenstrual period were appetite changes, depressive mood, fatigue, pain, irritability, and puffiness. Kisa et al. [12] in their study of university students stated that students mostly complained about appetite changes, depressive mood, fatigue, irritability, puffiness, and pain in the premenstrual period. Similarly, Erbil et al. [10], in their study of PMS frequency and effective factors in university students, reported that more than half of the participants complained about changes in appetite, irritability, puffiness, and pain. Since these complaints seriously affect life quality, family relations, and school performance, they should be handled as soon as possible.

Premenstrual complaints decrease productivity at work and the quality of work, cause economical losses and an increase in accident potential, as well as affect self-confidence, social relations, and school attendance. In our study, complaints due to the menstrual period affected the social life of 32.3% of students, school attendance of 22.3%, and daily activities of 37.0%. In a study by Babacan-Gümüş done with university students in 2012, it was found that these complaints affected daily activities of 31.2% of students, school attendance of 28.9%, and school success of 54.7% [19].

In dealing with PMS, both nonpharmacologic approaches (life changes, diet, exercising) and pharmacologic approaches (SSRI, GNRH agonists, oral contraceptives, diuretics, etc.) can be used [20,21]. However, in dealing with PMS, women prefer pharmacologic methods. In our study, of the students, 63.0% had painful menstruation, 32.8% of them were using analgesic drugs. Kisa et al. stated that 48.7% of students preferred analgesic drugs to deal with PMS. Also, in a study of married women in Turkey, 32.5% used analgesic drugs and 27.5% of them preferred resting to reduce pain before menstruation [12]. In a study by Weisz and Knaapen, it was stated that hormonal treatment and analgesic drugs were mostly used in France for PMS treatment, whereas herbal therapy was mostly used in Germany [21].

Conclusion

Since premenstrual complaints decrease effectiveness and work quality at work, increase economic loss and accident potential, and affect self-confidence, social relations, and school attendance of adolescent girls, for this reason, it is important to

deal with as soon as possible. Because it affects not only the person but also her family and society, it is inevitable that PMS affects the life quality of women.

Early on, young girls should be informed about the physiology of menstruation, the menstrual cycle, and PMS. Primary care physicians should adopt a biopsychosocial approach to treatment of PMS. Any incorrect beliefs and information regarding menstruation should be corrected, and they should also be provided with information about the effectiveness of changing food habits, exercising, and developing mechanisms to cope with stress.

List of abbreviations:

PMS: Premenstrual syndrome;

PMSS: Premenstrual Syndrome Scale;

Declaration of Conflicting Interests

The authors have declared there are no conflicting interests with respect to the preparation and publication of this article.

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Authors' contributions

RK: initiated and conceptualized the protocol; undertook patient recruitment, data collection, data extraction, drafting of the manuscript, interpretation and analysis of the data, and writing of the final version. ND, FD: undertook patient recruitment, data collection, data extraction, drafting of the manuscript, interpretation and analysis of the data, and writing of the final version. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

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