TÜBİTAK

Turkish Journal of Medical Sciences

http://journals.tubitak.gov.tr/medical/

Research Article

Turk J Med Sci
(2016) 46: 695-701
© TÜBİTAK
doi:10.3906/sag-1504-140

Premenstrual syndrome and life quality in Turkish health science students

Hatice IŞIK[1,*], Şule ERGÖL[2], Öner AYNIOĞLU[1], Ahmet ŞAHBAZ[1], Ayşe KUZU[3], Müge UZUN[4]

[1]Department Obstetrics and Gynecology, Faculty of Medicine, Bülent Ecevit University, Zonguldak, Turkey
[2]Department of Obstetric and Gynecologic Diseases Nursing, School of Health, Bülent Ecevit University, Zonguldak, Turkey
[3]Ahmet Erdoğan Health Services Vocational School, Bülent Ecevit University, Zonguldak, Turkey
[4]Department of Child Diseases Nursing, School of Health, Bülent Ecevit University, Zonguldak, Turkey

Received: 28.04.2015 • **Accepted/Published Online:** 27.07.2015 • **Final Version:** 19.04.2016

Background/aim: The purpose of the present study was to investigate the incidence of PMS, risk factors affecting PMS symptoms, and life quality in health science students.

Materials and methods: A total of 608 volunteer female students studying at the health campus of a state university in Turkey were included in the study. The participants were asked to fill out questionnaires on sociodemographic data, PMS symptoms, and SF-36 life quality tests.

Results: The overall frequency of PMS among participants was 84.5%. The average PMS and general health SF scores were 118.34 ± 37.3 and 20.03 ± 3.72, respectively. Students who had irregular breakfast, drank ≥2 cups of coffee/day, and consumed alcohol or fast food had higher PMS scores. Irregular menstruation and family history increased PMS scores and decreased life quality ($P < 0.05$). The life quality of the students significantly decreased as the severity of PMS increased ($P < 0.001$).

Conclusion: Low body mass index, family history, irregular menstruation, bad eating habits such as fast food consumption and irregular breakfasts, and coffee and alcohol consumption increased PMS risk significantly. In order to improve their life quality, students should be informed about the symptoms, risk factors, and management options of PMS.

Key words: Premenstrual syndrome, life quality, eating habits

1. Introduction

Premenstrual syndrome (PMS) is a common disorder that affects approximately 90% of women during the reproductive period at various degrees (1). The disease is diagnosed via the presence of physical, behavioral, and mood symptoms that arise in the luteal phase of the menstrual cycle and disappear after menstruation (2). PMS was first described by Frank and Horney in 1931 (3). The main symptoms of PMS are depression, mood swings, crying without reason, fatigue, irritability, anxiety, poor concentration, forgetfulness, increased appetite, gastrointestinal symptoms, edema, dizziness, flatulence, and mastalgia (4). At least one mood and physical symptom interfering with daily activities should be present in the week prior to menstruation to diagnose PMS (2).

The physical and/or emotional symptoms observed in PMS may decrease women's quality of life (QOL). According to the definition introduced by the World Health Organization (WHO), QOL is defined as a person's perception of his/her position in life within his/her culture and value system (5). In the literature, there are conflicting results with respect to the incidence of PMS and the effect of PMS symptoms on QOL (6,7,1).

Many theories regarding the cause of PMS have been suggested, including increased aldosterone activity, elevated adrenal function, hyperprolactinemia, hypoglycemia, decreased levels of central dopamine and serotonin, and decreased vitamin B6 and essential fatty acids. Decreased central dopamine and serotonin have been the most accepted causes (8).

However, many studies in the literature have reached a consensus regarding the risk factors triggering PMS, such as lifestyle (physical exercise, fast food ingestion, daily coffee, tea, and alcohol intake, cigarette smoking), history of PMS in first-degree relatives, and regular menstruation.

A few studies have been performed in Turkey to investigate PMS's effects on young students' QOL (9,10). The studies reported different incidences and risk factors of PMS and its symptoms. In the present study, we aimed

* Correspondence: k.hgonbe@gmail.com

to determine the incidence of PMS, risk factors, and the effect of PMS on QOL among health science students.

2. Materials and methods

This cross-sectional survey was given to female students studying health sciences at a state university in Turkey. The study was approved by the local ethics committee (Protocol no: 2014–97–20/05) and carried out between May and November of 2014. The participants were informed about the survey beforehand, and the students who volunteered were asked to fill out the questionnaire. The questionnaires were handed out in classrooms and students were asked to read and answer the questions. The sample size was calculated via power analysis. The prevalence of PMS was found to be 50%, and the α-error was 0.05. The power analysis was performed with a 95% confidence interval and a total sample size of 666. Fifty eight student scales were excluded from the evaluation because they did not fully fill out the questionnaires. According to this study, 91.29% of the targeted sample size was reached. Students with amenorrhea, chronic pelvic pain due to endometriosis or an organic disease, chronic disease, or adnexal masses, pregnant students, and students using oral contraceptives were excluded from the study. Six hundred and eight female students studying at the health sciences campus were included in the survey.

They were asked to fill out three questionnaires:

- Sociodemographic data;
- PMS scale revised from the Diagnostic and Statistical Manual of Mental Disorders (DSM - III);
- Life Quality Test-Short Form (SF 36).

The demographic data were collected from questions regarding age, body mass index (BMI), economic status, menstrual characteristics, fast food intake, and coffee, tobacco, and alcohol use. BMI was calculated as weight/(height × height) and classified according to WHO classification criteria (<18.5 kg/m^2: underweight; 18.5–24.99 kg/m^2: normal weight; ≥25 kg/m^2: overweight).

The American College of Obstetrics and Gynecology (ACOG) PMS diagnostic criteria, including behavioral (anxiety, depression, crying without reason, irritability) and somatic symptoms (breast tenderness, headache, abdominal blotting) were used. A student having at least one mood and one physical symptom was considered for a diagnosis of PMS. The PMS scale, validated by Gençdogan (11) from the DSM-III in 2006, was used to diagnose the severity of PMS. This PMS scale is a Likert type scale consisting of 44 questions. The scale is based on nine subscales: depressive mood, anxiety, tiredness, angry bursts, depressive thoughts, pain, appetite changes, sleep disturbances, and abdominal bloating. Each question was scored from 1 (not at all) to 5 (extreme). The lowest and the highest scores were 44 and 220, respectively. A total PMS score was calculated by summing the symptom scores. Subgroup scores were found by summing the scores of the related questions. If a student had 50% or more of the maximum scores, she was accepted as having the symptoms of the subgroups. PMS scores were divided into three categories, mild (0%–33%), moderate (33%–66%), and severe (>66%), by calculating the percentages of the PMS scores. An increase in the total scores indicated an increase in the severity of PMS.

The SF-36 questionnaire, consisting 36 questions and eight subgroups, was used to evaluate QOL. The SF-36 is a frequently used scale that was first developed by Ware and Sherbourne in 1992 (12). Its validity and reliability for Turkish people were established by Koçyigit et al. (13) in 1999. The eight subscales of the SF-36 are physical functioning, physical role, emotional role, bodily pain, general health, social functioning, mental health, and vitality. Each subject read over all 36 questions and marked an answer on the sheet. The maximum time for each person to fulfill the questionnaire took 10 min. All measures of the nine health components were scored according to previous studies (10), with 0 and 100 assigned to the lowest and highest possible scores, respectively. Every subscale was scored and the sum of subscale scores was calculated. The highest score indicates better life quality.

2.1. Statistical analysis

Statistical analyses were performed with SPSS 19.0. The distribution of the data was determined via Shapiro–Wilk test. Continuous variables were expressed as means ± standard deviation, and categorical variables were expressed as frequency and percent. Continuous variables were compared by using the independent sample t-test or Mann–Whitney U test for two groups. ANOVA or Kruskal–Wallis test was used to determine the differences between the three groups. $P < 0.05$ was considered significant for all tests.

3. Results

A total of 608 female students participated in the survey. The volunteers were all studying at the health sciences faculties; 157 were studying at the nursing high school, 149 at the faculty of medicine, 66 at the faculty of dentistry, and 236 were studying at other professional high schools. The median age of the participants was 20 (17–36) years, and the mean BMI was 21.36 ± 3.16 kg/m^2. Five students had the lowest PMS score of 44. The overall frequency of PMS was 84.5% according to the ACOG criteria. The means of the average PMS and general health SF scores were 118.34 ± 37.3 and 20.03 ± 3.72, respectively.

Table 1 shows the relationship between the sociodemographic properties and total PMS scores of the participants. Half of the students were between 17 and 20 years old (53.9%). About three-quarters of the students

Table 1. Sociodemographic characteristics and their relations with average PMS scores.

Variables		N (%)	Mean ± SD	P value
Age (year)	17–20 21–23 ≥24	328 (53.9%) 234 (38.5%) 46 (7.6%)	118.6 ± 37.6 120,76 ± 37.6 104.04 ± 31.4	0.846
Faculty	nursing high school medicine faculty faculty of dentistry health profession high schools	157 (25.8%) 149 (24.5%) 66 (10.9%) 236 (38.8%)	118.41 ± 35.65 119.41 ± 31.18 116.50 ± 36.4 118.29 ± 42.26	0.902
Living area	With friends/dormitory With family Alone	440 (72.4%) 115 (18.9%) 53 (8.7%)	118.97 ± 37.17 116.38 ± 39.03 117.30 ± 36.0	0.865
Family income level	Low Moderate High	116 (19.1%) 312 (51.3%) 180 (29.6%)	116.98 ± 42.07 117.07 ± 37.52 121.41 ± 33.81	0.376
Mother's education level	Elementary Secondary school High School Academic	300 (49.3%) 79 (13%) 112 (18.4%) 79 (13%)	119.2 ± 39.16 113.35 ± 39.36 119.05 ± 33.50 123.30 ± 29.92	0.417
Father's education level	Elementary Secondary school High School Academic	208 (49.3%) 89 (14.6%) 155 (25.5%) 152 (34.76%)	119.71 ± 39.83 112.58 ± 39.96 114.44 ± 33.59 123.40 ± 34.76	0.056

were living with friends at a house or dormitory. There were no statistical differences in average PMS scores for students with various sociodemographic characteristics ($P > 0.05$).

Students with BMIs < 18.5 kg/m^2 had higher PMS scores than those with higher BMIs ($P < 0.001$). Students who did not have a regular breakfast and who had ≥2 cups of coffee/day had higher PMS scores ($P = 0.007$ and $P = 0.028$, respectively). Alcohol (≥1 drink/week) and fast food intake (≥3 times/week) also increased PMS scores ($P = 0.004$, $P = 0.049$, respectively). Irregular menstruation, a PMS history in the mother, and a history of medication also caused increases in PMS scores ($P = 0.034$, $P < 0.001$, and $P < 0.001$, respectively). However, there were no significant correlations between physical exercise history, cigarette smoking, and menarche age and average PMS scores ($P > 0.05$).

PMS scores were grouped according to severity. The existence of the symptoms in a subgroup was accepted if the relevant score was more than half of the maximum score for that subgroup. The frequencies of the subgroup symptoms according to the severity of PMS were listed in Table 3. Tiredness and angry bursts were the most frequent symptoms. The frequencies of all symptoms increased as the severity of PMS increased. Ninety-four (15.5%) of the students did not receive a diagnosis of PMS according the ACOG criteria. About one-third (32.7%) of the students had mild PMS, and 33.2% had moderate PMS. However, 113 (18.6%) had severe PMS symptoms.

The differences between PMS groups and SF-36 mean scores were given in Table 4. Physical functioning, physical role, general health, social functioning, mental health, and vitality scores significantly decreased as the severity of PMS symptoms increased ($P < 0.001$). However, bodily pain scores significantly increased as the PMS severity increased. There were no statistically significant differences among PMS groups regarding the quality of the emotional role ($P = 0.104$).

The life quality test scores were compared in terms of the presence or absence of dysmenorrhea and family history in Table 5. Social functioning, vitality, and general health scores were significantly decreased, whereas bodily pain score was significantly increased in the presence of dysmenorrhea. The presence of family history significantly decreased social functioning, mental health, general health scores, and increased bodily pain scores (Table 5).

4. Discussion

The present study showed the frequency of PMS among health science students using the ACOG criteria. The most

Table 2. PMS risk factors and PMS average scores. The data are given as means ± SD. P < 0.005 was considered significant.

Variables		N (%)	Mean ± SD	
BMI (kg/m$^{2)}$	<18.5 18.5–24.99 ≥25	138 (22.7%) 403 (66.3%) 67(11.0%)	145.98 ± 21.79 109.57 ± 36.90 114.13 ± 38.62	<0.001
Physical exercise	Yes No	31 (5.1%) 577 (94.9%)	124.06 ± 38.12 118.03 ± 37.35	0.45
Regular breakfast	No Sometimes Always	65(10.7%) 105 (17.3%) 438 (72%)	132.37 ± 39.13 115.73 ± 37.73 116.19± 38.01	0.007
Coffee intake	<2 cups/day ≥2 cups/day	578 (95.1%) 30 (4.9%)	117.6 ± 37.21 132.30 ± 38.43	0.028
Cigarette smoking	Yes No	124 (20.4%) 484(79.6%)	122.62 ± 36.82 117.24 ± 37.48	0.160
Alcohol intake	Yes No	127 (20.9%) 481 (79.1%)	126.52 ± 34.90 116.18 ± 37.75	0.004
Fast food	Yes No	506 (83.2%) 102 (16.8%)	119.52 ± 36.67 112.48 ± 40.4	0.049
Regular menstruation	Yes No	464 (76.3%) 144 (23.7%)	116.49 ± 37.11 124.30 ± 37.76	0.034
Age at menarche	≤12 >12	168 (27.6%) 440 (72.4%)	116.85 ± 38.57 118.90 ± 36,95	0.540
History of PMS in the mother	Yes No	257 (42.3%) 351 (57.7%)	130.38 ± 32.87 109.52 ± 38.06	<0.001
Medication for PMS	Yes No	428 (70.4%) 180 (29.6%)	124.71 ± 35.43 103.19 ± 37.63	<0.001

Values in bold are significant.

Table 3. The frequencies of PMS symptoms according to the severity of PMS.

Lower subscales of PMS	No PMS (n = 94)	Mild (n = 199)	Moderate (n = 202)	Severe (n= 113)
Depressive mood	6 (6.4%)	83 (41.7%)	180 (89.1%)	109 (96.5%)
Anxiety	0 (0%)	18 (9%)	80 (39.6%)	84 (74.3%)
Tiredness	3 (3.2%)	106 (53.3%)	194 (96.0%)	113 (100%)
Angry bursts	2 (2.1%)	91 (45.7%)	188 (93.1%)	111 (98.2%)
Depressive thought	0 (0%)	32 (16.1%)	134 (66.3%)	107 (94.7%)
Pain	3 (3.2%)	87 (43.7%)	157 (77.7%)	109 (96.5%)
Appetite changes	22 (23.4%)	116 (58.3%)	164 (81.2%)	101 (89.4%)
Sleep disturbances	2 (2.1%)	71 (35.7%)	141 (69.8%)	104 (92%)
Abdominal bloating	19 (20.2%)	116 (58.3%)	168 (83.2%)	102 (90.3%)

Table 4. SF - 36 life quality score means according to the PMS severity. Data are given as means ± sd. P < 0.05 was accepted as significant.

Lower subscales of SF-36 life quality test	No PMS (n = 94)	Mild (n = 199)	Moderate (n = 202)	Severe (n = 113)	P value
Physical health	27.17 ± 3.68	26.39 ± 4.18	25.25 ± 4.82	24.04 ± 5.05	< 0.001
Physical role	3.17 ± 0.91	2.63 ± 1.20	2.23 ± 1.30	2.08 ± 1.35	< 0.001
Social relations	8.34 ± 1.58	8.0 ± 1.47	7.24 ± 1.52	6.60 ± 1.63	< 0.001
Bodily pain	4.14 ± 1.86	4.76 ± 1.87	5.74 ± 2.02	6.59 ± 2.11	< 0.001
Mental health	21.75 ± 4.39	20.40 ± 3.79	18.38 ± 3.38	16.98 ± 3.91	< 0.001
Vitality	16.98 ± 3.11	16.03 ± 3.22	14.83 ± 2.97	13.87 ± 4.10	< 0.001
General health	21.91 ± 3.63	20.73 ± 3.35	19.26 ± 3.43	18.60 ± 4.00	< 0.001
Emotional role	4.80 ± 1.30	4.90 ± 1.26	4.60 ± 1.24	4.69 ± 1.31	0.104

Values in bold are significant.

Table 5. SF-36 life quality score means with regard to the presence of dysmenorrhea or family history. Data were given as mean ± SD. P < 0.05 was considered significant.

SF-36 test subscales	Dysmenorrhea			Family history of PMS		
	Yes	No	P value	Yes	No	P value
Physical health	25.53 ± 4.68	26.25 ± 4.34	0.124	25,49 ± 4,6	25.85 ± 4.6	0.149
Physical role	2.42 ± 1.29	2. 66 ± 1.21	0.064	2,34 ± 1,28	2.58 ± 1.26	0.150
Social relations	7.43 ± 1.64	7. 92 ± 1.62	0.002	7,3 ± 1,68	7.72 ± 1.60	0.003
Bodily pain	5.80 ± 2.02	3. 74 ± 1.65	< 0.001	5,4 ± 2,00	5.1 ± 2.13	0.002
Mental health	19.10 ± 4.09	19.9 ± 4.09	0.053	18,85 ± 4,0	19.6 ± 4.0	0.026
Vitality	15.15 ± 3.4	16.15 ± 3.48	0.019	15,03 ± 3,4	15.6 ± 3.4	0.078
General health	19.8 ± 3.69	20.8 ± 3.71	0.006	19,6 ± 3,7	20.3 ± 3.7	0.035
Emotional role	4.70 ± 1.27	4.90 ± 1.28	0.083	4,73 ± 1,31	4.76 ± 1.25	0.666

Values in bold are significant.

important point this study emphasized is that, besides the known risk factors of PMS such as low BMI, family history, and irregular menstruation, bad eating habits such as fast food intake, irregular breakfast, and coffee and alcohol consumption increased PMS risks significantly. We found that PMS frequency was 84.5%, which was similar to the results reported by Öztürk et al. (14), in which the PMS prevalence was 79%. The studies performed in Turkey revealed a PMS prevalence varying from 6.1% to 91.8%. Adıgüzel et al. (9) studied PMS prevalence in reproductive-period women aged between 15 and 49 years and found the prevalence to be as low as 6.1%. Derman et al. (15) found the PMS prevalence in adolescents to be 61.4%. PMS prevalence differs by country; for example, studies from the UK and the US reported a PMS prevalence of 24% and 31%, respectively (16,17). In European and Latin American women the prevalence was 37%. In Australian women the prevalence was 43%, and, in Asian women it was less than 20%, according to the ACOG criteria (18). The large variation in the prevalence rate is due to the usage of various diagnostic criteria for PMS (ACOG, DSM IV, etc) and to differences in study populations, age, and cultural and social norms. For this reason, the comparison of results from various studies has been a problem.

In the current study, BMI and a family history of PMS were found to be the most important risk factors. Lean females had the highest PMS scores in our study. Moreover, PMS scores were higher in females who took medication.

Farrokh-Eslamlou et al. (19) found significant differences in PMS scores in regards to BMI, family history, and medication intake, which were similar to those seen in our study. In their study, they reported that coffee intake and physical exercise had no effect on PMS scores. However, in our study, coffee intake, drinking alcohol, and eating fast food significantly increased PMS scores, whereas regular breakfast ingestion decreased the scores.

The most common physical and mental symptoms were fatigue and angry outbursts, with 100% and 98.2% frequencies, respectively. Pain and depressed mood symptoms existed in 96.5% of the participants. The least frequent symptoms were related to anxiety (74.3%) and were much higher than in the study by Farrokh-Eslamlou et al. (19), in which anxiety and nervousness symptoms were found to be as low as 13.4%. Various studies declared different frequencies for the symptoms. Farrokh-Eslamlou et al. (19) reported that affective lability and decreased interest in usual activities were the most frequent mental and physical symptoms (56.3% and 49.3%, respectively). Goker et al. (10) found abdominal bloating in 89.5% of the students, which was similar with our finding of 90.3%. Attieh et al. (20) stated that breast tenderness was the most frequent symptom in Nigerian university students at 65%. These results showed us that the frequencies of the symptoms were much higher in young Turkish women. This difference may be due to cultural norms and doctrines.

Regular menstruation decreases PMS symptoms because the students who experienced regular menstruation had significantly lower PMS scores than the others in our study. The dysmenorrhea rate was also high, 77.1% in our study, and 91.2% of the students with dysmenorrhea symptoms were in the severe PMS group. Unsal (21) also found the prevalence of dysmenorrhea among university students to be 72.7%. A study performed in Ethiopia found a similar rate for dysmenorrhea: 85.1% among university students (22). Shiferaw et al. (22) proposed that menstrual cycle length, a family history of dysmenorrhea, and circumcision were factors most related with dysmenorrhea. Any kind of treatment for dysmenorrhea was used by 70.4% of the participants. Forty percent used oral medication, which was higher than the rate at which medical treatment was demanded (6.9%) in the study by Goker et al. (10). Other than oral medication, herbal tea (20.4%), a warm bag (39.1%), rest (33.6%), and exercise (5.1%) were used to reduce pain. This may have been due to a higher awareness of PMS, dysmenorrhea symptoms, and treatments among the students.

Physical and mental symptoms of PMS and the severity of these symptoms in students affected the life quality scores in our study. The more severe the PMS symptoms were, the lower the QOL scores were for social health, physical health, social relations, mental health, general health, and vitality. Bodily pain scores increased as PMS severity increased. Only the emotional role was not found to be affected by PMS severity in our study. However, in a study of Iranian medical students, it was found that only mental health and environmental health domains decreased as the severity of PMS increased (19). Sahin et al. (23) found lower average life quality scores among students with PMS ($P < 0.05$ for each domain). The life quality of students in our study was also significantly affected ($P < 0.001$ for each domain, except emotional role).

We also studied students from different health sciences faculties. The highest average PMS scores were seen in medical students; however, there were no significant differences between the PMS scores of the students based on the faculties. The life quality scores of the students, when compared among faculties, were also not statistically different, except for physical functioning ($P < 0.001$). The high level of physical functioning seen in medical students may be attributed to increased study hours and responsibilities.

A family history of PMS affected life quality scores for bodily pain, general health, social functioning, and mental health. Goker et al. (10) reported that all parameters of the SF-36 test were affected by a family history of PMS. Dysmenorrhea also affected social functioning and vitality. In addition, general health scores were significantly decreased, whereas the bodily pain score was significantly increased in our study. The domains of the SF-36 scale, with the exception of physical functioning and the role and emotional domains, showed decreases with increasing dysmenorrhea severity among university students (21). Unsal (21) also concluded that dysmenorrhea had negative effects on health-related QOL.

Studies on PMS symptoms and life quality of students have been conducted in the past. However, our study differs in that we reported a higher incidence of PMS than the other studies, which were conducted in different countries. Moreover, the incidence of PMS in our study was found to be much higher even compared with other studies in our country. The most important point this study emphasized is that apart from the known risk factors of PMS such as low BMI, family history, and irregular menstruation, bad eating habits such as fast food intake, irregular breakfast, and coffee and alcohol consumption increased PMS risks significantly. These findings may be viewed in light of the relationship between cultural and social norms of Turkish society and PMS.

In conclusion, PMS is a serious problem in young individuals. As PMS symptoms worsen and the severity increases, life quality decreases. The most important risk factors for PMS such as family history and the presence of dysmenorrhea have negative effects on life quality. Thus, health professionals should educate female students about

how to cope with PMS symptoms and improve their life quality. In addition, seminars on healthy lifestyles with an emphasis on eating habits may be conducted to decrease PMS symptoms.

Acknowledgment
All authors thank the voluntary participants.

The English version of the manuscript was edited by www.scribendi.com: proof reading/editing services.

References

1. Bakhshani N, Hasanzadeh Z, Raghibi M. Prevalence of premenstrual symptoms and premenstrual dysphoric disorder among adolescents students of Zahedan. Zahedan Journal of Research in Medical Sciences 2012; 13: 29-34.
2. ACOG. Practice bulletin: premenstrual syndrome. Int J Gynecol Obstet 2001; 73: 183-191.
3. Osofsky HJ. Efficacious treatments of PMS: a need for further research. JAMA 1990; 264: 387.
4. Speroff L, Fritz MA. Clinical Gynecologic Endocrinology and Infertility. 8th ed. Philadelphia, PA, USA: Lippincott Williams & Wilkins; 2005.
5. Study protocol for the World Health Organization project to develop a Quality of Life assessment instrument (WHOQOL). Qual Life Res 2 1993: 153-159.
6. Abdollahi FS, Dolatian M, Heshmat R, Alavimajd H. The effect of foot reflexology on premenstrual syndrome. Archives Des Sciences Journal 2012; 65: 140-149.
7. Braverman PK. Premenstrual syndrome and premenstrual dysphoric disorder. J Pediatr Adol Gynec 2007; 20: 3-12.
8. Berek JS. Berek's & Novak's Gynecology. (Translated in Farsi by Ghazi-Jahani B). Tehran, Iran: Golban Publications; 2007.
9. Adıgüzel H, Taskin EO, Danaci AE. The symptomatology and prevalence of symptoms of premenstrual syndrome in Manisa, Turkey. Turk Psikiyatri Dergisi 2007; 18: 215-222.
10. Goker A, Artunc-Ulkumen B, Aktenk F, Ikiz N. Premenstrual syndrome in Turkish medical students and their quality of life. J Obstet Gynaecol 2014; 20: 1-4.
11. Gençdogan B. A new scale for premenstrual syndrome. Türkiye'de Psikiyatri 2006; 8: 81-87.
12. Ware JE Jr, Sherbourne CD.The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care 1992; 30: 473-483.
13. Koçyiğit H, Aydemir Ö, Fisek G. Kısa Form-36'nın Türkçe Versiyonunun Güvenilirliği ve Geçerliliği. İlaç ve Tedavi Dergisi 1999; 12: 102-106 (article in Turkish).
14. Öztürk S, Tanrıverdi D, Erci B. Premenstrual syndrome and management behaviors in Turkey. Aust J Adv Nurs 2006; 28: 54-60.
15. Derman O, Kanbur NO, Tokur T, Kutluk T. Premenstrual syndrome and associated symptoms in adolescent girls. Eur J Obstet Gynecol Reprod Biol 2004; 116: 201-206.
16. Sadler C, Smith H, Hammond J, Bayly R, Borland S, Panay N, Crook D, Inskip H; Southampton Women's Survey Study Group. Lifestyle factors, hormonal contraception, and premenstrual symptoms: the United Kingdom Southampton Women's Survey. J Womens Health 2010; 19: 391-396.
17. Vichnin M, Freeman EW, Lin H, Hillman J, Bui S. Premenstrual syndrome (PMS) in adolescents: severity and impairment. J Pediatr Adol Gynec 2006; 19: 397-402.
18. Dennerstein L, Lehert P, Bäckström TC, Heinemann K. Premenstrual symptoms severity, duration and typology: an international cross-sectional study. Menopause Int 2009; 15: 120-126.
19. Farrokh-Eslamlou H, Oshnouei S, Heshmatian B, Akbari E. Premenstrual syndrome and quality of life in Iranian medical students. Sex Reprod Healthc 2015; 6: 23-27.
20. Attieh E, Maalouf S, Richa S, Kesrouani A. Premenstrual syndrome among Lebanese medical students and residents. Int J Gynecol Obstet 2013; 121: 184-185.
21. Unsal A, Ayranci U, Tozun M, Arslan G, Calik E. Prevalence of dysmenorrhea and its effect on quality of life among a group of female university students. Upsala J Med Sci 2010; 115: 138-145.
22. Shiferaw MT, Wubshet M, Tegabu D. Menstrual problems and associated factors among students of Bahir Dar University, Amhara National Regional State, Ethiopia: a cross-sectional survey. Pan Afr Med J 2014; 17: 246.
23. Sahin S, Ozdemir K, Unsal A. Evaluation of premenstrual syndrome and quality of life in university students. J Pak Med Assoc 2014; 64: 915-922.