



The impact of dysmenorrhea and premenstrual syndrome on academic performance of college students, and their willingness to seek help

Üniversite öğrencilerinde dismenore ve premenstrüel sendromun akademik performans üzerine etkisi ve yardım isteme eğilimleri

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Abstract

Objective: To reveal the characteristics and prevalence of dysmenorrhea and Premenstrual syndrome (PMS) among college students and to investigate their impact on their academic performance.

Materials and Methods: This cross-sectional study was conducted between December 2017 and January 2018 at Koç University, Turkey. An online survey that included multiple-choice and short paragraph questions was prepared. Female students aged between 18 and 27 years were invited with an email to provide online informed consent to proceed to the survey.

Results: The final analysis included 352 students. The prevalence of dysmenorrhea was found as 90.1%. Fifty-six percent of the participants reported lower academic performance during menstruation. However, only 32.8% of the students with dysmenorrhea presented to the gynecology clinic. The prevalence of PMS alone and with dysmenorrhea was 71.3% and 65.9%, respectively. The most common symptom among those who reported affected academic performance was depression (prevalence of 27.5%). However, only 19.9% of students with PMS consulted a healthcare professional.

Conclusion: Symptoms of dysmenorrhea and PMS are generally neglected by students. Quality of life can be affected more than estimated. Considering the reluctance to disclose menstrual disorders, health care providers should be aware of them and ask women about their symptoms during routine visits.

Keywords: Dysmenorrhea, premenstrual syndrome, pelvic pain, survey, academic performance

Öz

Amaç: Dismenore ve Premenstrüel sendromun (PMS) üniversite öğrencilerindeki karakteristiklerini ve prevalansını ortaya çıkarmak ve akademik performansları üzerindeki etkilerini incelemek.

Gereç ve Yöntemler: Bu kesitsel çalışma Aralık 2017-Ocak 2018 tarihleri arasında Koç Üniversitesi'nde gerçekleştirilmiştir. Çoktan seçmeli ve kısa paragraf soruları içeren çevrimiçi bir anket hazırlanmıştır. On sekiz ve 27 yaş aralığındaki kadın öğrenciler e-posta ile ankete davet edilmiş ve ankete başlayabilmeleri için çevrimiçi aydınlatılmış onam formu doldurmaları istenmiştir.

Bulgular: Üç yüz elli iki öğrencinin katıldığı çalışmada dismenore prevalansı %90,1 idi. Katılımcıların %56'sı menstrüasyon sırasında daha düşük akademik performans belirtti. Ancak, dismenore olan öğrencilerin sadece %32,8'i jinekoloji kliniğine başvurduğunu belirtti. Tek başına ve dismenore ile birlikte olan PMS prevalansı sırasıyla %71,3 ve %65,9, olarak bulundu. Akademik performansını etkilediğini bildirenler arasında en sık görülen semptom depresyon (%27,5 prevalans) idi. Bununla birlikte, PMS'isi olanların sadece %19,9'u bir sağlık merkezine başvurduğunu belirtti.

Sonuç: Dismenore ve PMS semptomları genellikle öğrenciler tarafından ihmal edilmektedir. Yaşam kalitesi tahmin edilenden daha fazla bozulabilir. Menstrüel bozuklukları paylaşmadaki isteksizlik göz önüne alındığında, sağlık personeli bunların farkında olmalı ve rutin ziyaretleri sırasında kadınlarda bu semptomların varlığını sorgulamalıdır.

Anahtar Kelimeler: Dismenore, premenstrüel sendrom, pelvik ağrı, anket çalışması, akademik performans

PRECIS: PMS and dysmenorrhea are ignored by college students. Early education can be an efficient method to increase awareness and prevent delays in diagnosis and management.

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Introduction

Primary dysmenorrhea, defined as recurrent lower abdominal and/or pelvic pain during menstruation affects 45 to 95% of women of reproductive age⁽¹⁾. Primary dysmenorrhea refers to dysmenorrhea in the absence of an organic pathology, and secondary dysmenorrhea can occur due to gynecologic disorders such as endometriosis, adenomyosis or uterine fibroid, as well as others.

Premenstrual syndrome (PMS) presents with at least one affective symptom (irritability, anxiety, confusion, depression, anger outburst, or social withdrawal) and at least one somatic symptom (abdominal bloating, breast tenderness, headache, or swelling of extremities) during the five days prior to menses and presenting in at least three consecutive menstrual cycles⁽²⁾. Also, within four days of the onset of menses, symptoms should be alleviated. The most severe form of PMS is premenstrual dysphoric disorder, which is defined by the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition criteria as one or more of the following symptoms; mood swings/sudden sadness/increased sensitivity to rejection, anger/irritability, sense of hopelessness/depressed mood/self-critical thoughts, or tension/anxiety/feeling on edge⁽³⁾. The prevalence of PMS was reported as 47.8% in a meta-analysis, which called for further studies from different countries (95% confidence interval: 32.6-62.9)⁽⁴⁾.

The impact of dysmenorrhea and PMS on the academic performance of female students has not been studied fully. A survey conducted among female high school adolescents revealed that dysmenorrhea alone or together with PMS was associated with school absenteeism⁽⁵⁾. Another survey conducted among female university students focused only on dysmenorrhea and reported a negative effect on the quality of life⁽⁶⁾.

The primary aim of this study was to reveal the characteristics and prevalence of dysmenorrhea and PMS in a college population. The secondary aim was to investigate their impact on the academic performance of college students.

Materials and Methods

This cross-sectional study was conducted at Koç University in Istanbul, Turkey, between December 13th, 2017, and January 15th, 2018. We prepared an online survey that included multiple-choice and short paragraph questions. To standardize the survey, we conducted a literature review from PubMed; afterwards, we prepared the final form of the survey questions regarding our above-mentioned research purposes. This study was approved by Koç University Institutional Review Board (IRB) (2017. 216.IRB3.119). Female students aged between 18 and 27 years were invited by email for participation. Students whose first language was not Turkish were excluded from the study.

The sample size was calculated as 347 via the Australian National Statistical Service Sample Size Calculator Tool. The

total number of female students was 3511, and 347 respondents were needed for 95% confidence and 0.05 as the confidence interval, with a standard error and relative standard error of 0.025 and 5.10, respectively.

Participants/Materials, Setting, Methods

Participants were required to provide online informed consent in order to proceed to the questionnaire. Identification information was not collected.

Regular menstruation was defined as one occurring with 21 to 35 days intervals. Visual analogue scale (VAS) scores from 0 to 10, where 10 represented the most severe form of pain, were used to quantify pain. The diagnosis of PMS was made according to previously defined criteria⁽²⁾.

Statistical Analysis

The Statistical Package for the Social Sciences (SPSS) Version 24.0 (Chicago, IL, USA) was used to analyze the data. The statistical analysis was performed with a mean, median, and percentage.

Questionnaire

The questionnaire comprised three sections. The first section consisted of descriptive questions including age, school, age at menarche, and menstruation characteristics such as regularity and duration. The second section questioned the presence of dysmenorrhea and its characteristics including severity, persistency, duration, accompanying symptoms (nausea, vomiting, headache, migraine, back pain, breast tenderness, decrease in appetite, dizziness, constipation, painful defecation, painful urination, and others), and the respondent's perception of whether the pain affected their academic performance, annual school absenteeism in days due to dysmenorrhea, whether they disclosed the fact that absence was due to painful menstruation to their instructor, the magnitude of the impact on daily life and social life, if they ever presented to a gynecologist and/or emergency department regarding dysmenorrhea, whether a pelvic ultrasound revealed pathology that would cause dysmenorrhea, their diagnosis for dysmenorrhea, coping mechanisms for the pain (herbs, exercise, rest, hot shower, hot pack, oral/intramuscular/intravenous analgesics, oral contraceptive pills, and intrauterine device), whether they changed their coping mechanisms in the course of time, family history (Fhx) of dysmenorrhea including their mothers, sisters, aunts, and grandmothers, and the diagnosis if Fhx was positive. The third section included questions regarding PMS. The ten PMS symptoms (irritability, anxiety, confusion, depression, angry outburst, social withdrawal, abdominal bloating, breast tenderness, headache, and swelling of extremities) were listed, and the participants were asked to choose the ones they encountered five days prior to their menstrual bleeding. Secondly, they selected the most disturbing symptom among the reported symptoms. Because PMS was described previously as the presence of at least one of the ten symptoms in at least

three consecutive menstrual cycles⁽²⁾, they were asked to choose whether they had the symptoms during more or less than three consecutive menstrual cycles. Whether they consulted a physician about PMS, if yes, their speciality, treatment, and whether they benefited from the treatment were questioned. They were asked to identify the symptom that most affected their academic performance. Annual school absenteeism in days due to PMS and whether or not they disclosed that absence was due to PMS to their instructor were asked. Finally, they were asked to report and quantify the medical conditions they experienced before their period.

Results

A total of 457 students completed the survey with a participation rate of 13.0%. Only 353 students completed the entire survey. One participant was excluded due to conflicting responses. Hence, the final analysis included 352 students. Demographic features and menstrual cycle characteristics, including menarche, cycle length, duration of bleeding, and regularity of the participants are presented in Table 1.

The prevalence of dysmenorrhea was found as 90.1%, where the proportion of never, occasionally, usually, and always responses were 9.9%, 38.6%, 31.3%, 20.2%, respectively

Table 1. Demographic features of the participants together with menstrual cycle characteristics

| Variable | Number |
|--|-------------|
| Age (years) | |
| Median (25 th - 75 th percentiles) | 21 (20-22) |
| Range | 18-27 |
| Departments (%) | |
| The Social Sciences and Humanities | 106 (30.0) |
| College of Administrative Sciences and Economics | 68 (19.3) |
| School of Medicine | 50 (14.4) |
| College of Engineering | 43 (12.2) |
| School of Nursing | 31 (8.8) |
| Law School | 30 (8.5) |
| College of Sciences | 24 (6.8) |
| Total | 352 (100) |
| Menarche (years) | 13 (12-13)* |
| Cycle length (days) | 28 (28-30)* |
| Duration of bleeding (days) | 5 (4-6)* |
| Menstrual Cycle Regularity (%) | |
| Regular | 265 (75.3)* |
| Irregular | 87 (24.7)* |

*Median (25th -75th percentiles)

(Figure 1). The median (25th - 75th percentile) VAS was 8 (7-9). The persistence of dysmenorrhea was 46.3%. The median duration of dysmenorrhea per cycle was 2 (range, 1-6) days. Accompanying symptoms and the coping mechanisms of dysmenorrhea are shown in Table 2. Thirty-one percent of women changed their coping mechanisms over time. Fifty-six percent of the participants reported lower academic performance during menstruation. The median school absenteeism due to dysmenorrhea was three days annually for 201 people (range, 1-24). Only 12.8% of the students stated that they could disclose that their absence was due to painful menstruation with their instructors without hesitation. Only seven of the nursing and 12 of the medical students shared their menstrual disorders (25.9% and 26%, respectively). Ninety-five percent of the participants reported that dysmenorrhea did not affect their daily life; however, 92% of reported a negative effect on social life. Admission to an outpatient gynecology clinic and the emergency department was 32.8% and 25.8%, respectively. Almost sixty-six percent of the students with dysmenorrhea indicated a positive Fhx for dysmenorrhea. On the other hand, 40% of the students without dysmenorrhea indicated positive Fhx for dysmenorrhea.

According to the aforementioned PMS criteria, we found the prevalence of PMS alone and with dysmenorrhea was 71.3%, and 65.9%, respectively. The distribution of symptoms from most to least common among the students diagnosed with PMS was abdominal bloating 215 (85.7%) and irritability 202 (80.5%), breast tenderness 187 (74.5%), angry outburst 182 (72.5%), anxiety 158 (62.9%), confusion 158 (62.9%), depression 141 (56.2%), social withdrawal 92 (36.7%), headache 74 (29.5%), and swelling of extremities 54 (21.5%) where the participants were allowed to choose more than one option. The most disturbing symptom reported by the students was anger outburst with a prevalence of 25.1% (63 students). Only 19.9% of the students with PMS had consulted a gynecologist, psychiatrist, neurologist, psychologist or endocrinologist (15.5%, 1.6%, 1.2%, 1.2%, and 0.4%, respectively). As treatment among the students with PMS, 7.6% of the participants reported using oral contraceptives. The most common symptom among those who reported affected academic performance was depression with a prevalence of 27.5%. One hundred twenty-two students reported school

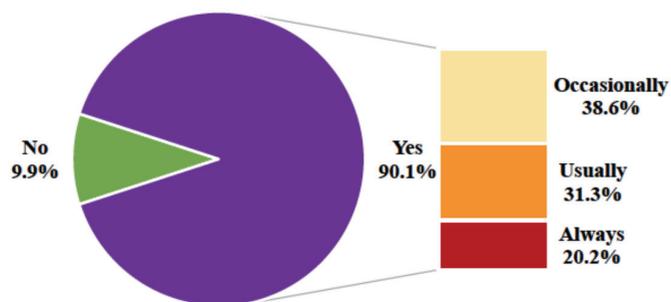


Figure 1. Dysmenorrhea prevalence

absenteeism (range, 1-38 days, annually) due to PMS. However, only 11 (4.4%) students stated that they could share that the absence was due to PMS with their instructors without hesitation. Among the nursing and medical students who reported that school absenteeism was due to PMS, 22.2% and 18.2%, respectively, could share with their instructors without hesitation. Finally, the severity of the PMS symptoms is listed in Table 3.

Discussion

Our survey indicates that dysmenorrhea is a common problem among university students. More than half of the participants reported that dysmenorrhea affected their

Table 2. Accompanying symptoms[†] and coping mechanisms[†] of dysmenorrhea

| | Number (%) |
|--------------------------|------------|
| Accompanying symptoms* | |
| Back pain | 210 (59.7) |
| Breast tenderness | 206 (58.5) |
| Nausea | 117 (33.2) |
| Diarrhea | 123 (34.9) |
| Headache | 101 (28.7) |
| Decrease in appetite | 74 (21) |
| Dizziness | 56 (15.9) |
| Constipation | 52 (14.8) |
| Migraine | 41 (11.6) |
| Painful defecation | 38 (10.8) |
| Vomiting | 38 (10.8) |
| Painful urination | 25 (7.1) |
| None | 12 (3.4) |
| Coping mechanisms | |
| Analgesics | 294 (92.6) |
| Oral | 251 (79.1) |
| Intramuscular | 26 (8.2) |
| Intravenous | 17 (5.3) |
| Hot pack | 201 (63.4) |
| Hot shower | 179 (56.6) |
| Rest | 110 (34.8) |
| Herbs | 47 (14.8) |
| Oral contraceptive pills | 32 (10.0) |
| Exercise | 31 (9.7) |
| Hobbies | 26 (8.2) |
| Intrauterine device | 0 (0) |

*Ranked from the most frequent to the least, [†]Participants were allowed to choose more than one option

academic performance mainly due to absenteeism. Our results also showed that depression was the most common symptom affecting their academic performance, which could perhaps be prevented by consulting a health professional and sharing their problems. Also, more than 70% of students reported experiencing PMS symptoms, and the most common symptom was anger outburst, which affects social life negatively.

Surveys are prone to bias when the response rate is too low. The participation rate in our study was 13%, likely because we inactivated the survey when we reached the calculated sample size. It is possible that students with dysmenorrhea and/or PMS were more likely to complete the questionnaire. This might have caused an overestimation of dysmenorrhea and PMS prevalence. Our study group homogeneously consisted of educated women, and the study was anonymous, which gave the confidentiality of identity.

Menstrual disorders such as dysmenorrhea and PMS can affect academic performance, mental well-being, and quality of life. Menstrual disorders are estimated to affect almost 2.5 million women every year⁽⁷⁾. The symptoms can be physical, emotional, or behavioral, which is thought to be derived from hormonal fluctuations⁽⁸⁾. Even PMS is thought to result from ovulation and hormonal fluctuations and primary dysmenorrhea from increased production of prostaglandins resulting in painful uterine contractions and decreased blood flow; however, the etiology of menstrual disorders is yet to be identified^(8,9).

A strong association between quality of life and severity of PMS symptoms has been reported in the literature^(10,11). The majority of women in reproductive age have at least one symptom of dysmenorrhea and/or PMS⁽¹²⁻¹⁶⁾. We wanted to address the impact of the symptoms of menstrual disorders on the academic performance of female students. Similar to our results, several other studies also reported that menstrual disorders caused school absenteeism, defects in social life, and a decline in academic performance⁽¹⁷⁻¹⁹⁾. Absenteeism varied in a range of 18.6% to 80.6% among university students in previous studies^(16,20,21).

The retrospective diagnosis of PMS is a limitation of this study. However, because there is not an objective diagnostic criterion of PMS⁽²²⁾, it is difficult to evaluate its accurate prevalence. Further studies should be designed prospectively via providing the participants with the charts for PMS symptoms for at least for three consecutive months. Hence, we would like to ask experts to prepare an up-to-date objective universal guideline. Intriguingly, highly educated women are hesitant to disclose their menstrual disorders and even their absenteeism being due to dysmenorrhea or/and PMS symptoms to their instructors⁽²³⁾. Even more remarkably, medical and nursing school students, who are expected to have a higher awareness of these disorders, were also reluctant to share the fact that their absenteeism was due to menstrual disorders. Sharing and presenting to a gynecology clinic or for emergency care was also low among the students. This makes one think that most women consider

Table 3. Severity of the premenstrual syndrome symptoms (n=251)

| | None (%) | Mild (%) | Moderate (%) | Severe (%) |
|--|-----------|-----------|--------------|------------|
| 1. Depressed, sad, "down" or "blue" feeling of worthless or guilty | 11 (4.4) | 66 (26.3) | 92 (36.7) | 82 (32.7) |
| 2. Anxious, tense, "keyed up" or on edge | 9 (3.6) | 47 (18.7) | 96 (38.2) | 99 (39.4) |
| 3. Mood swings/sensitive to rejection | 8 (3.2) | 34 (13.5) | 98 (39.0) | 111 (44.2) |
| 4. Angry or irritable | 7 (2.8) | 44 (17.5) | 85 (33.9) | 115 (45.8) |
| 5. Less interested in usual activities | 30 (12.0) | 74 (29.5) | 103 (41.0) | 44 (17.5) |
| 6. Lack of concentration | 53 (21.1) | 66 (26.3) | 87 (34.7) | 45 (17.9) |
| 7. Lethargic, tired, fatigued or of energy | 3 (1.2) | 52 (20.7) | 85 (33.9) | 111 (44.2) |
| 8. Increased appetite or food cravings | 42 (16.7) | 58 (23.1) | 81 (32.3) | 70 (27.9) |
| 9. Insomnia/hypersomnia | 46 (18.3) | 65 (25.9) | 77 (30.7) | 63 (25.1) |
| 10. Overwhelmed, unable to cope | 37 (14.7) | 61 (24.3) | 76 (30.3) | 77 (30.7) |
| 11. Breast tenderness, breast swelling, bloated sensation, weight gain, headache, joint or muscle pain, or other physical symptoms | 11 (4.4) | 64 (25.5) | 99 (39.4) | 77 (30.7) |
| 12. Reduced productivity or inefficiency at work, school, home or in daily routine | 31 (12.4) | 64 (25.5) | 100 (39.8) | 56 (22.3) |
| 13. Less participation in hobbies or social activities | 38 (15.1) | 76 (30.3) | 97 (38.6) | 40 (15.9) |
| 14. Interference in relationships with others | 23 (9.2) | 74 (29.5) | 98 (39.0) | 56 (22.3) |

menstrual disorders as natural and do not seek a remedy, rather the try to manage with temporary solutions or to live with it. On the other hand, the lack of seeing a physician due to menstrual disorders also causes a delay in diagnoses for conditions underlying secondary dysmenorrhea, such as endometriosis⁽²⁴⁾.

Current treatment options for dysmenorrhea include non-hormonal medical therapy such as acetaminophen and non-steroidal anti-inflammatory drugs, hormonal treatment such as contraceptive pills or progestin regimens⁽²⁵⁾. Complementary and alternative treatment options can be recommended, such as exercise, transcutaneous electrical nerve stimulation, acupuncture and acupressure, behavioral interventions, topical heat, and dietary supplements⁽²⁵⁾. Most of the respondents improved their coping mechanisms with dysmenorrhea in an unusual way in our study. Some of them reported benefiting from these strategies; however, mostly, they were temporary. Analgesic usage was very common among participants (92.6%). Only 10% of the students were on oral contraceptive pills. Most of the students used alternative methods while managing with their symptoms such as hot packs (63.4%), hot showers (56.6%), rest (34.8%), herbs (14.8%), exercise (9.7%), and hobbies (8.2%).

Conclusion

Symptoms of dysmenorrhea and PMS are frequently neglected by college students. The symptoms can vary widely among women. Quality of life can be affected more than estimated,

and even being a female can be regarded as a misfortune by the affected population. Considering the reluctance to disclose menstrual disorders, healthcare providers should be aware of the fact and ask women about such symptoms in routine visits. Thereby, the symptoms of PMS and dysmenorrhea ignored by women, which affect the quality of life, can be identified, and awareness can be increased. Besides, education for adolescents can be an efficient method to increase awareness and prevent delays in diagnosis.

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Ethics

Ethics Committee Approval: This study was approved by Koç University Institutional Review Board (IRB) (2017. 216. IRB3.119).

Informed Consent: Participants were required to provide online informed consent in order to proceed to the questionnaire. Identification information was not collected.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Concept: E.B., Ş.Y., K.Y., B.A., Design: E.B., Ş.Y., K.Y., B.A. Data Collection or Processing: E.B., Ş.Y., B.A., Analysis or Interpretation: E.B., Ş.Y., B.A., Literature Search: E.B., Ş.Y., B.A., Writing: E.B., Ş.Y., B.A.* E.B., Ş.Y.: The authors contributed equally.

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