

A Cross-Sectional Study on Menstrual Symptoms and Anxiety in Health Science Students: Perspective of Lecture and Exam Periods

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Abstract

Aim: The academic performance of the students decreases due to menstrual symptoms. Anxiety stands as a notable determinant influencing menstrual symptoms. Therefore, the aim of the study to examine students' anxiety levels and dysmenorrhea variables during lecture and exam periods.

Method: Menstrual symptoms and anxiety levels were measured the Menstruation Symptom Scale and State and Trait Anxiety Inventory in female students (age: 21.09±1.70 years). The differences between academic periods and the relationship between anxiety and menstrual symptoms were analysed.

Results: Anxiety and menstrual symptoms increased during the exam period, when compared to the lecture period ($p<0.05$). Menstruation symptoms and anxiety were found to be correlated in the exam period ($p<0.05$).

Conclusion: It has been reported that students experience more severe menstrual symptoms and anxiety during exam periods compared to regular semesters. Future interventions should aim to reduce the negative impact of exam-related anxiety on menstrual symptoms. There is a need for further research to address these barriers in academic settings for female students

Keywords: Menstruation, dysmenorrhea, pain, anxiety.

Sağlık Bilimleri Öğrencilerinde Menstrüasyon Semptomları ve Anksiyete Üzerine Kesitsel Bir Çalışma: Ders ve Sınav Süreçlerinin Perspektifi

Öz

Amaç: Öğrencilerin akademik performansı, menstrüasyon semptomları nedeniyle düşmektedir. Anksiyete, menstrüasyon semptomlarını etkileyen önemli bir faktör olarak öne çıkmaktadır. Bu nedenle, çalışmanın amacı, öğrencilerin ders ve sınav dönemlerindeki anksiyete seviyeleri ve dismenore değişkenlerini incelemektir.

Yöntem: Menstrüasyon semptomları ve anksiyete seviyeleri, kadın öğrencilerde (yaş: 21,09±1,70 yıl) Menstrüasyon Semptomları Ölçeği ve Durumluk-Sürekli Anksiyete Envanteri kullanılarak ölçülmüştür.

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ETHICAL STATEMENT: Ethics committee permission for the study was received from the Istanbul Gelisim University Ethics Committee (Date: 04.11.2022, Number: 2022-16-63) and the study was conducted in accordance with the principles of the Declaration of Helsinki.

Akademik dönemler arasındaki farklar ile anksiyete ve menstrüasyon semptomları arasındaki ilişki analiz edilmiştir.

Bulgular: Sınav döneminde, ders dönemiyle karşılaştırıldığında anksiyete ve menstrüasyon semptomlarının arttığı bulunmuştur ($p<0,05$). Menstrüasyon semptomları ile anksiyete arasında sınav döneminde bir ilişki olduğu saptanmıştır ($p<0,05$).

Sonuç: Sınav dönemlerinde, öğrencilerin normal dönemlere göre daha şiddetli menstrüasyon semptomları ve anksiyete yaşadıkları bildirilmiştir. Gelecekteki müdahaleler, sınavla ilgili anksiyetenin menstrüasyon semptomları üzerindeki olumsuz etkilerini azaltmayı hedeflemelidir. Kadın öğrenciler için akademik ortamlardaki bu engelleri ele almak amacıyla daha fazla araştırmaya ihtiyaç vardır.

Anahtar Sözcükler: Menstrüasyon, dismenore, ağrı, anksiyete.

Introduction

Periodic bleeding from the uterine corpus that begins with menarche during the reproductive period and continues with hormonal changes until menopause is called menstruation¹. Despite the absence of any anomalies in the reproductive system, periodic lower abdominal, back, or leg pain described as "crampy" (sudden, short, and painful muscle contractions) that occurs before or during menstruation is defined as primary dysmenorrhea. Typically, headaches, nausea, vomiting, diarrhea, or constipation may also accompany this condition. The World Health Organization (WHO) indicates that the international prevalence ranges from 16.8% to 81.0%, with a prevalence of 70.9% in women under 25 years old²

Menstrual discomfort leads to a decreased quality of life, absenteeism from school, and diminished workforce participation among working women² 87.6% of the students are at risk of gynaecological diseases and the most common condition is dysmenorrhea with a rate of 63.2%³. In a study conducted in Türkiye, the prevalence of dysmenorrhea among female university students was found to be 85.7% and 30.4% of these students described their pain as very severe. Dysmenorrhea in students was found to be associated with absenteeism, participation in daily and social activities, functional limitations, and academic inequality⁴.

It is important to evaluate psychological symptoms such as depression, anxiety and stress in women experiencing pain⁵. Stress activates the sympathetic nervous system, causing contractions in the uterus, and thus pain occurs during menstruation⁶. Exams serve as a significant source of academic stress, commonly inducing feelings of anxiety and leading to physiological changes in the autonomic nervous system. This anxiety is also associated with decreased performance⁷. It is thought that dysmenorrhea and premenstrual symptoms have a strong relationship with stress and affect academic performance^{8,9}.

In this study, it was assumed that there would be a difference between the anxiety levels and menstrual symptoms of female students during lecture and exam periods and evaluate to better understand the effects of academic anxiety to menstrual symptoms.

Material and Methods

This research was conducted with students from the Nursing, Physiotherapy and Rehabilitation, Child Development, Nutrition and Dietetics, Gerontology, and Occupational Therapy departments at a university's Faculty of Health Sciences in

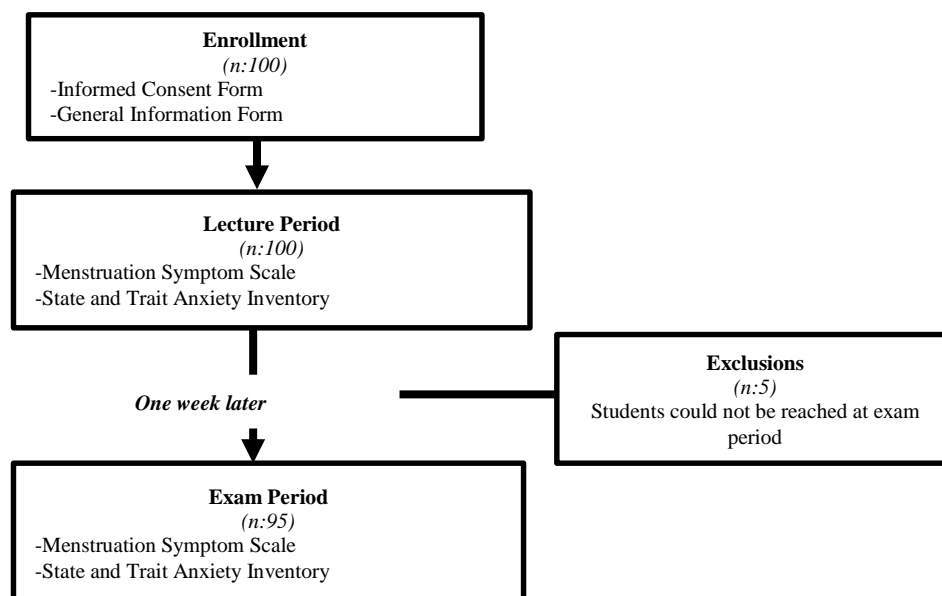
Türkiye. A total of 95 female participants (age=21.09±1.70 years) were included in the study and completed both examinations, who were enrolled on a voluntary basis and who were given informed consent forms before participation. The eligibility criteria are as follows:

Inclusion Criteria: Age range from 18 to 25, engage in cooperation and fulfill assessment scales, having menstrual pain complaints in most of the menstrual cycles, onset of pain on the day before or on the first day of menstruation, pain relief within 48-72 hours after the start of menstruation, having pain in the lower back, groin or abdomen.

Exclusion Criteria: Participation of more than 150 minutes of physical activity per week, having given birth, a history of gynaecological diagnosis or surgery, using hormonal contraception (such as oral contraceptives and injections), having psychiatric diagnosis, having an eating disorder.

A data collection form was used to question the demographic characteristics of the individual such as age, height, weight, success status, smoking status, participation in physical activity, chronic diseases, drug use, menstrual cycles and pain, and methods of coping with pain. The Menstruation Symptom Scale (MSQ) and State and Trait Anxiety Inventory (STAI) were applied to participants who met the inclusion criteria, first during the exam week and then one week later during the lecture period, for a total of two assessments (Figure 1). The study was conducted with a one-week interval to minimize the impact of menstrual cycles and other lifestyle factors (such as smoking, sleep hours, weight, etc.) that could affect menstrual symptoms^{10,11}. Participants were asked to evaluate their menstrual symptoms based on the symptoms they most commonly experience, in line with the purpose of the survey. The statistical analysis part of the study was carried out by a researcher who was not involved in the evaluation processes.

Figure 1. Flow chart of the study.



Menstruation Symptom Scale: The MSQ is designed to assess the severity of menstrual pain and associated symptoms experienced by women periodically. A Turkish validation and reliability analysis was undertaken to evaluate its psychometric properties. The MSQ consists of 22 items and employs a 5-point Likert scale. It assesses three specific sub-dimensions: negative effects/somatic complaints, menstrual pain symptoms, and coping mechanisms. The questions in the scale are related not only to the symptoms women experience during menstruation, but also to the symptoms they experience before the cycle. Since the scale assesses general menstrual symptoms experienced by individuals, participants were not required to be in their menstrual cycle. An increase in the mean score indicates a higher severity of periodic menstrual symptoms. Similarly, an increase in the average score within each sub-dimension indicates a corresponding escalation in the severity of menstrual symptoms associated with that particular sub-dimension. The Cronbach's Alpha coefficient for the scale is reported as 0.86^{12,13}.

State and Trait Anxiety Inventory: The scale comprises a total of 40 items, divided into the "State Anxiety Scale" (SAS) and the "Trait Anxiety Scale" (TAS), both comprising 20 items. The SAS prompts respondents to assess their feelings about their current situation, whereas the TAS assesses individuals' general self-perceptions. Scores on each scale range from 20 to 80. Higher scores indicate higher levels of anxiety, while lower scores indicate lower levels¹⁴.

Statistical Analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 22.0. The sample was calculated as 90 using G*Power program, for type 1 error value $\alpha=0.05$, Power $(1-\beta)=0.95$ and Pearson Correlation Coefficient (r) from the reference article¹⁵. To account for potential loss during data collection 100 participants were chosen for the study group, with an additional 10% contingency.

Descriptive statistics were used to determine the general characteristics of the participants. The normal distribution of the data was assessed using the Kolmogorov-Smirnov test. The difference between variables during exam and lecture periods was analyzed using the Paired Sample T-test. The relationship between variables was examined using the Pearson Correlation Coefficient. In all statistical analysis, the significance level was accepted as $p<0.05$.

Results

During the lecture period, 5 out of the 100 individuals contacted were unreachable for the examination during the exam period (Figure 1). Table 1 demonstrates the demographic characteristics of 95 female participants, who have enrolled and completed the study. The differences between variables between lecture and exam period are shown in Table 2.

Table 1. Demographic characteristics and menstrual information of participants

	Mean \pm SD (n=95)	%95 CI
Age (year)	21.09 \pm 1.70	20.74 - 21.44
Height (m)	1.63 \pm 0.06	1.61 - 1,64
Weight (kg)	58.35 \pm 11.03	56.10 - 60.60
BMI (kg/m ²)	21.86 \pm 3.76	21.09 - 22.63
Menstrual age (year)	13.01 \pm 1.42	12.73 - 13.30
Menstrual period (day)	5.93 \pm 1.54	5.61 - 6.24
Menstrual cycle (day)	28.08 \pm 4.17	27.23 - 28.93

BMI: Body Mass Index, SD: Standard Deviation.

Table 2. Differences of variables between lecture and exam period

	Lecture Period (Mean \pm sd)	Exam Period (Mean \pm sd)	t	p
MSQ Negative Effect	42.38 \pm 10.52	43.54 \pm 10.00	1.22	.22
MSQ Menstrual Pain	20.01 \pm 5.59	20.35 \pm 4.85	.64	.52
MSQ Coping Methods	8.56 \pm 3.12	9.03 \pm 3.13	1.57	.11
MSQ Total	70.95 \pm 17.59	73.07 \pm 15.96	1.42	.15
STAI-State	44.61 \pm 10.61	49.29 \pm 11.54	4.01	.001*
STAI-Trait	46.40 \pm 9.52	48.44 \pm 10.53	2.62	.01*

STAI: State-Trait Anxiety Inventory, MSQ: Menstrual Symptom Questionnaire, sd: standard deviation, t: Paired Sample T-test, *p<0.05.

Statistically significant differences were found between the lecture and exam period for STAI-State (t: 4.01, p: .001) and STAI-Trait (t: 2.62, p: .01) variables. Table 3 demonstrates the correlation between MSQ and STAI variables at the lecture and exam period. There was statistically significant correlation between MSQ Coping Methods (r: 0.22, p: .03) and MSQ Total (r: 0.21, p: .04) with STAI-Trait, only at the exam period.

Table 3. Correlation between MSQ and STAI variables at lecture and exam period

			STAI-State	STAI-Trait		STAI-State	STAI-Trait
			Lecture Period			Exam Period	
MSQ Negative Effect	r	Lecture Period	-	-0.03	.	-	.18
	p			.76			.16
MSQ Menstrual Pain	r		-0.07	.04	.	-	.12
	p		.48	.65			.57
MSQ Coping Methods	r		.03	.09	.	.	.22*
	p		.73	.38			.80
MSQ Total	r		-0.03	.11	.	-	.21*
	p		.73	.25			.58

STAI: State-Trait Anxiety Inventory, MSQ: Menstrual Symptom Questionnaire, r: Pearson Correlation Coefficient, *p<0.05.

Discussion

In this study, we aimed to investigate the anxiety levels during lectures and exam periods in students of health sciences along with the variables of dysmenorrhea.

It was observed that increased exam-related anxiety correlated with more menstrual symptoms and greater use of coping strategies. Similarly, a study reported that students experienced pain, early menstruation, and hypermenorrhoea problems during exam periods¹⁶. In another study, premenstrual syndrome (PMS) was found in 93% of students with painful menstruation, and it was observed that this syndrome was present in 73% of students with mild stress and 93% of students with moderate stress. The statistical analysis demonstrated a significant correlation between stress and PMS¹⁷. Studies have shown a correlation between psychological factors like depression, anxiety and dysmenorrhea. Moreover, dysmenorrhea has been shown to increase the risk of experiencing these psychological problems. These findings highlight the significance of integrating psychological assessments into the treatment of dysmenorrhea^{5,18}. In this study, the fact that students reported experiencing more menstrual symptoms during exam periods may be due to the increase in students' psychosocial problems such as anxiety. Since 48.7% of students reported that their academic performance decreased due to dysmenorrhea in a study, determining the relationship between increased anxiety during the exam period and menstrual symptoms is important in reflecting the risk in students' academic success¹⁹.

In a study conducted in Türkiye, by applying a 6-week cognitive behavioural approach to students, it was determined that their painkiller use, and dysmenorrhea-related symptoms decreased, and the importance of these applications was emphasized²⁰. In another study conducted on female students in Türkiye, it was stated that relaxation exercises reduced the menstrual pain levels of students²¹. Precautions should be planned to prevent this relationship between anxiety and menstruation from affecting students' academic success, and female students whose symptoms worsen, and their success decreases due to test anxiety should be supported.

During exam periods, we observed that students experienced higher menstrual pain severity. In studies where students had similar pain levels, it was reported that pain negatively affected their academic participation^{22,23}. This study suggests that heightened pain intensity during exams and significant differences in pain levels during activity may contribute to academic challenges for students due to menstrual symptoms. Increased anxiety levels of students during the exam period may negatively affect their pain levels and academic participation.

In this study, which involved students with a mean age of 21.09 years (SD = 1.70), it was found that 60% of them used painkillers to control their pain. In a study involving university students, 91.2% of those reporting menstrual pain did not consult a doctor, while 62.4% continued to use medication for pain relief¹⁹. Students' lack of awareness about dysmenorrhea may have caused them to see it as a natural consequence of menstruation. It is essential to prevent students from resorting to uninformed medication use to cope with dysmenorrhea without consulting a doctor. Instead, more

sustainable methods for addressing dysmenorrhea problems should be pursued.

Studies have shown that menstrual pain may contribute to a decline in students' academic performance^{24,25}. Determining the relationship between increased anxiety during the exam period and menstrual symptoms is important in reflecting the risk in students' academic success. Measures should be planned so that this relationship between anxiety and menstruation does not affect the academic success of students, and female students whose symptoms worsen and whose success decreases due to exam anxiety should be supported.

Limitations

Since this study was specifically conducted among health sciences students at a university, it might not be accurate to generalize the results to the entire population. Although there are many factors that may affect menstrual symptoms and anxiety, it was not possible to evaluate all of them in the study. However, this research is the first in Türkiye to examine the connection between exam stress and menstrual symptoms among female students studying health sciences. It is also important in that it includes female students from more than one field and brings students' problems to the agenda.

Conclusion

According to the study's findings, anxiety levels escalate among female students during exam periods, and this increase in anxiety is correlated with menstrual symptoms. It is recommended to develop approaches for female students in education to improve the menstrual symptoms and not affect their academic success. In further studies, the effects on symptoms can be investigated by applying methods to reduce anxiety.

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Conflict of Interest

The authors state that they have no conflicts of interest.

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