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Araştırma Makalesi/ Research Article

Dysmenorrhea Prevalence, Affecting Factors and Self-Care Experiences in Young Adolescent Girls

Adolesan Genç Kızlarda Dismenore Prevalansı, Etkileyen Faktörler ve Öz Bakım Deneyimleri

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ABSTRACT

Objective: Dysmenorrhea is an important reproductive health problem with biopsychosocial effects in adolescents. The aim of this study is to determine the frequency of dysmenorrhea in adolescents, affecting factors, and dysmenorrhea self-care experiences.

Methods: This study used a cross-sectional design. Data were collected from students (n=1160) enrolled in seven high schools in a province in Türkiye. Data were analyzed using descriptive statistics, chi-square, one-way analysis of variance, t-test, Mann-Whitney U, Kruskal Wallis test, and multiple logistic regression tests.

Results: In this study, the prevalence of dysmenorrhea was determined as 89.7%. It was determined that dysmenorrhea was affected by age (β = 1.482), stress in life (β = 1.520), menstrual cycle (β = 2.044), menarche attitude (β = 1.598), drug use (β = 2.854) and family dysmenorrhea (β = 2.943).

Conclusion: It is recommended that reproductive health and menstruation education begin before adolescence and that health programs be updated to include dysmenorrhea self-care under the title of reproductive health. In addition, it is recommended that interventions be made regarding stress, drug use, and negative attitudes towards menarche, which have modifiable properties that have the potential to affect dysmenorrhea and self-care behaviors.

Keywords: Adolescent, dysmenorrhea, self-care

ÖZ

Amaç: Dismenore adolesanlarda biyopsikososyal etkileri olan önemli bir halk sağlığı sorunudur. Bu araştırmada adolesanlarda dismenore prevelansı, etkileyen faktörler ve dismenore öz bakım deneyimlerini saptamak amaçlandı.

Yöntem: Bu çalışmada kesitsel tasarım kullanılmıştır. Veriler Türkiye'de bir ildeki yedi lisede öğrenim gören öğrencilerden (n=1160) tanısal bir anket ve Adolesan Dismenore Öz Bakım Ölçeği aracılığıyla toplandı. Analizler tanımlayıcı istatistikler, ki-kare, tek yönlü varyans analizi, t-testi, Mann-Whitney U, Kruscal Wallis ve çoklu lojistik regresyon testleriyle yapıldı.

Bulgular: Katılımcılar arasında dismenore prevalansı %89.7 olarak belirlendi. Dismenorenin yaş (β = 1.482), yaşamdaki stres (β = 1.520), adet döngüsü (β = 2.044), menarş tutumu (β = 1.598), ilaç kullanımı (β = 2.854) ve ailedeki dismenore varlığından etkilendiği belirlendi (β = 2.943).

Sonuç: Adolesanlara yönelik üreme sağlığı ve menstruasyon eğitiminin ergenlik öncesinde başlaması ve sağlık eğitimi programlarının dismenore öz bakımını içerecek yapıda güncellenmesi önerilmektedir. Ayrıca dismenore ve öz bakım davranışları üzerinde etki potansiyeli bulunan değiştirilebilir özelliğe sahip stres, menarşla ilgili olumsuz tutumlar ve ilaç kullanımına ilişkin müdahalelerin yapılması önerilmektedir.

Anahtar Kelimeler: Adolesan, dismenore, öz bakım

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Ordu University J Nurs Stud
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Introduction

Dysmenorrhea is defined as pain experienced by women during menstruation from the age of menarche (Ferries-Rowe et al., 2020). Symptoms of dysmenorrhea include pelvic and abdominal pain that occurs in the lower part of the body and typically begins several hours before or simultaneously with menstruation (Tsai et al., 2024). Symptoms other than pain include nausea, vomiting, headache, diarrhoea, constipation, sensitivity to external stimuli, fatigue and dizziness (Ferries-Rowe et al., 2020; Tsai et al., 2024). However, symptoms associated with dysmenorrhea have been shown to have a significant impact on quality of life, often leading to absenteeism in occupational or educational settings, reduced productivity, and increased healthcare demands (Tsai et al., 2024).

Dysmenorrhea is a problem with a prevalence of 16% to 94% among societies (Ferries-Rowe et al., 2020; Pouraliroudbaneh et al., 2024). In a systematic review and meta-analysis of studies involving more than 20,000 young women from different countries, the prevalence of dysmenorrhea was found to be 71.1% (Armour et al., 2019b). In Türkiye, this rate is 69.3% and 94.7% (Koçoğlu and Zincir, 2021; Sayiner et al., 2017). The general projection is that there has been an increase in the prevalence of dysmenorrhea worldwide over the years (Armour et al., 2019b). Previous evidence suggests that several factors increase the risk of primary dysmenorrhea. Early menarche, age, irregular menstrual cycle, sleep deprivation, stress and caffeine consumption increase the intensity of pain and family history of dysmenorrhea are important risk factors (Kabukcu et al., 2021; Karout et al., 2021).

Dysmenorrhea can lead to lower academic performance and poor sleep quality, gastrointestinal discomfort, headache, and fatigue, negatively affect mood, and cause anxiety, depression and stress in adolescents (Kabukcu et al., 2021). They also experience more inattention and hyperactivity-impulsivity problems and have unhealthy eating habits (Kabukcu et al., 2021). Approximately 15% of adolescents miss more than one school day per cycle, and 16% have a decrease in academic performance (Söderman et al., 2019). In a study conducted by Akduman and Budur (2016) with university students, it was observed that 92.4% of the participants experienced fatigue with dysmenorrhea, 70.1% experienced problems such as inability to attend classes, 48.3% experienced inability to concentrate, and 22% experienced irritability. Staying away from social activities due to dysmenorrhea was also seen in 59% (Söderman et al., 2019). However, in a small study conducted on adolescents with dysmenorrhea, 28% of adolescents sought help from the emergency department (Sahin et al., 2018). Healthcare costs of patients with dysmenorrhea are 2.2 times higher than the general population (Akiyama et al., 2017). All these figures are alarming regarding social impacts and economic resource allocation.

Dysmenorrhea interferes with achieving educational/career goals, social relationships, emotional well-being and starting a family, indicating that many young women are hindered in their daily lives due to dysmenorrhea (Söderman et al., 2019). In particular, dysmenorrhea is called a neglected reproductive health disease. Societal unequal power relations, social norms that restrict access to education and paid employment opportunities, a focus solely on women's reproductive roles, and violence are just some of the sociocultural factors that prevent women and girls from receiving quality health care and achieving the highest level of health, including dysmenorrhea (Getahun et al., 2023).

Adolescence is a period of life when dysmenorrhea management is less effective, and research has shown that adolescents often resort to self-care practices rather than medical treatment for dysmenorrhea (Parra-Fernánde et al., 2020). In a study, 67% of participants used complementary and alternative therapies to manage dysmenorrhea, and the reasons for using these methods included reducing the need for analgesics (82%), safety (53.3%), effectiveness (46%), availability (35.6%), seeking advice from others (19.9%) and cost (7.3%) (Almanasef and Alqarni, 2023). Socioeconomic structure also significantly influences ways of coping with dysmenorrhea (Defert et al., 2024). Adolescents' lack of interest or a topic considered taboo by parents may restrict adolescents' participation (Defert et al., 2024). The availability, affordability, accessibility, acceptability and quality of health services are influenced by various factors and individual characteristics such as knowledge, attitudes, beliefs, preferences, severity of illness and coping strategies. This situation reveals the importance of determining the self-care practices of adolescents with dysmenorrhea.

School nurses provide direct health services to improve the health of students and staff (Ju et al., 2019). School nurses have an important responsibility in the early diagnosis of menstrual

Ordu University J Nurs Stud
2026, 9(2), 207-219
DOI:1038108/ouhcd.1564023

problems, providing health education about the menstrual cycle and dysmenorrhea, and helping students and families choose appropriate methods (Söderman et al., 2019). The school nurse can ask questions to determine whether these symptoms occur with the menstrual cycle and interpret them as signs and symptoms of dysmenorrhea. School nurses can significantly improve the well-being of adolescent girls experiencing menstrual cramps by focusing on both information dissemination and practical coping techniques. Thanks to advances in the internet and big data, they can create authoritative and scientific information platforms that students can access and reference, thereby increasing students' e-health literacy (Chen et al., 2023). Through structured and interactive educational methods, female students can increase their understanding of dysmenorrhea and learn how to cope with the symptoms they experience. In addition, a personalised approach to dysmenorrhea management is necessary to increase the effectiveness of the cognitive and practical activities implemented. Tele-counselling (Arisani and Wahyuni, 2022), mobile applications (Bala et al., 2024), exercise (Tsai et al., 2024), relaxation and massage practices (Ju et al., 2019), individual and group health education programmes (Aksu and Vefikuluçay Yılmaz, 2024) and yoga are among the sample programme contents.

Menstrual health is receiving increasing attention and is recognised as essential for achieving gender equality and sustainable development goals (Sommer et al., 2021). However, the prevalence of dysmenorrhea has been increasing over the years and data on adolescent dysmenorrhea are still insufficient (Kabukcu et al., 2021). In addition, although there are many studies on dysmenorrhea worldwide, there are very few studies on self-care strategies for dysmenorrhea in adolescents (De Sanctis et al., 2020). Studies on dysmenorrhea-related self-care skills have mostly focused on the university population (James et al., 2022). In the national literature, a limited number of studies on dysmenorrhea in the adolescent population were found (Kabukcu et al., 2021; Koçoğlu and Zincir, 2021; Sahin et al., 2018; Sayiner et al., 2017). In these studies, quality of life (Koçoğlu and Zincir, 2021; Sahin et al., 2018; Sayiner et al., 2017), anxiety and depression (Sahin et al., 2018), and attention deficit and hyperactivity (Kabukcu et al., 2021) in adolescents with dysmenorrhea were evaluated. Therefore, this study aimed to determine the frequency of dysmenorrhea, factors affecting it, and dysmenorrhea self-care experiences in adolescents.

Research Questions

1. What is the prevalence of dysmenorrhea in adolescents?

2. What are the factors affecting dysmenorrhea?

3. What are the self-care practices of adolescents with dysmenorrhea?

Methods

Design and Sample

This research was conducted using a cross-sectional design with students (N=1200) enrolled in high schools in a province of Türkiye between 15.04.2017 and 15.05.2017. This study employed a non-probability sampling method to represent the entire student population in the region comprehensively. A total of 1160 students participated, constituting 96.6% of the target population. All adolescents who satisfied the inclusion criteria were invited to participate in the study. The inclusion criteria were as follows: (a) the presence of the adolescent in the classroom during the data collection process, (b) the obtaining of permission from the parents, and (c) the volunteering of participation in the study. Exclusion criteria were the presence of any disease that may cause dysmenorrhea.

Data Collection Tools

This study used the diagnostic form and Adolescent Dysmenorrhea Self-Care Scale (ADSCS).

Dysmenorrhea Diagnostic Questionnaire Form

Descriptive characteristics (age, type of school, place of residence, family situation, social relations, weight), habits (use of tobacco, physical activity, nutrition, tea and coffee consumption, sleep patterns), menstruation (age of menarche, period and it includes 31 questions and the Visual Analogue Scale regarding the pattern, number of pads used, attitude towards menarche, symptoms, gynecological diseases, drug use) and dysmenorrhea (presence of dysmenorrhea, severity, duration, affected areas, dysmenorrhea in the family). Pain intensity between 1 and 3 was considered mild, 4 and 7 as moderate, and 8 and 10 as severe (Phan et al., 2012). The study determined height and weight according to student reporting, and BMI was calculated on a computer.

Adolescent Dysmenorrhea Self-Care Scale (ADSCS)

The scale was developed by Hsieh et al. (2004) based on Orem's Self-Care Deficit Theory. The scale

Ordu University J Nurs Stud
2026, 9(2), 207-219
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determines adolescents' self-care experiences regarding dysmenorrhea. The Turkish validity and reliability study of the scale was conducted by Sürücü and Ergün (2023). ADSCS comprises 6 Likert types (0 = disagree- 5 = 100% agree) and 40 questions. The scale is defined as two dimensions, external behavior and internal behavior, and six subdimensions. There are two internally directed subscales (resource use and self-control presence), and four externally subscales (seeking information, expressing emotions, seeking help, and control over external factors). An increase in ADSCS score is evaluated as an increase in self-care behaviors. Sürücü and Ergün (2023) determined the ADSCS Cronbach alpha coefficient as 0.96. The scales validity and reliability were tested within the scope of this study.

Procedures

After obtaining the necessary permissions, school administrators were interviewed, and suitable days and hours for data collection were determined. Informed consent forms were sent to the parents and students in sealed envelopes. The students were asked to deliver the envelope to their teachers the next day. The students who were allowed to participate in the study by their parents were informed about the purpose of the study. Data collection tools were given to those willing to participate and completed in the conference room or classroom during appropriate class hours under the supervision of the researchers. Data collection was completed based on the participants' self-reports. The data collection process took 20-30 minutes.

Data Analysis

This research data was analyzed using the licensed SPSS 25 program. Participants' characteristics regarding dysmenorrhea and self-care were examined with descriptive statistics. Independent variables and dysmenorrhea were first compared using chi-square analysis. While the ADSCS total score was found to be normally distributed, the subscale scores were not normally distributed. One-way analysis of variance and t-test in independent groups were used to compare independent variables and ADSCS total score averages; Mann-Whitney U and Kruscal Wallis analysis of variance were used to compare the independent variables and the medians of the ADSCS sub-dimensions.

In the continuation of the analyses, the Enter model was used in multiple logistic regression to analyze the relationship between dysmenorrhea and the independent variables. As the dependent variable, those who experienced dysmenorrhea were coded as = 1, and those who did not experience it were coded as 0. Age, presence of a stressful problem in one's life, menstrual cycle pattern, attitude towards menarche, drug use, and presence of dysmenorrhea in the family were taken as independent variables in the model. Statistical significance was evaluated at a p-value of <0.05.

Results

Descriptive Data of Participants

According to the results of this research, the average age of the participants is 16.52±1.08. 59.3% (n=688) of the participants were in technical high school, and 30.9% (n=358) were tenth-grade students. Among the mothers of adolescents who participated in the study, 42.1% (n=488) had completed elementary school, and 60.5% (n=702) were not employed. 97.4% (n=1130) stated that they lived with their family, and 89.9% (n=1043) stated that their economic situation was medium (Table 1).

Table 1. Individual characteristics of students (N:1160)

Variables	Mean	SS
Age (min:14, max:19)	16.52	1.08
School type	**n**	**%**
Anatolian high school	303	26.1
Religious high school	169	14.6
Technical high school	688	59.3
Grade		
9	246	21.2
10	358	30.9
11	305	26.3
12	251	21.6
Education level of the mother		
Illiterate	72	6.2
Literate	68	5.9
Elementary school	488	42.1
Secondary school	333	28.7
High school	175	15.1
University and above	24	2.0
Employment status of the mother		
Employed	428	36.9
Unemployed	702	60.5
Retired	14	1.2
Other	16	1.4
Living places		
At home with family	1130	97.4
With relatives	19	1.6
In dormitory	11	0.9
Economic situation		
Low	64	5.5
Medium	1043	89.9
High	53	4.6

SS:StandardDeviation; Min:Minimum; Max:Maximum

Ordu University J Nurs Stud
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In this study, it was determined that 17.1% (n=199) of the participants had a BMI above normal, 39.7% (n=461) ate irregularly, and 63.5% (n=737) did not engage in regular physical activity. 11.9% (n=138) of students smoke tobacco, and 55% (n=638) say that there was a problem in their lives that caused intense stress. 54.1% (n=627) of the students said they slept ≥7 hours on weekdays and 23.4% (n=272) on weekends. 2.4% (n=28) stated that they had a bad relationship with their mother, 1.7% (n=20) with their friend, 7.5% (n=87) with their father, 5.2% (n=60) with their sibling, and 3.6% (n=42) with their teacher.

According to the findings of this research, the average age of menarche of the participants is 13.19±1.18, the average menstrual period is 5.7±1.32 days, and the number of pads used on the day when bleeding is most intense is 3.56±1.42. 40.8% (n=473) of the students stated that their menstrual cycle was irregular, and 53.9% (n=625) stated that their attitude towards the first menarche was negative. 8% (n=93) of the students had a gynecological problem, and 13.3% (n=154) were using drugs. The most common menstrual symptoms experienced by the students were determined to be irritability in 71% (n=824), back pain in 66% (n=766), and fatigue in 62.9% (n=730), respectively.

It was found that 44.1% (n=512) of the students experienced menstrual pain 'occasionally ' and 45.6% (n=529) 'always.' According to the dysmenorrhea criteria, 89.7% (n=1041) of the students had dysmenorrhea. 34.7% (n=403) of the students stated that the pain period continued for 24 hours after menstruation. In evaluating pain intensity using VAS, the average pain intensity was 6.57±2.3. According to the findings of this research, 9.8% (n=102) of the participants experience mild pain, 51.4% (n=535) experience moderate pain, and 38.8% (n=404) experience severe pain (Table 2). 77% (n=894) of the students had menstrual pain problems in their mother or sibling.

Table 2. Characteristics of students regarding dysmenorrhea (N=1160)

Variables	n	%
Dysmenorrhea		
None	512	44.1
Yes, occasionally	529	45.6
Yes, always	119	10.3
Pain duration		
1-2 hours after menstruation	292	28.0
24 hours after menstruation	361	34.7
48-72 hours after menstruation	215	20.7
During menstruation	173	16.6
Pain intensity (min:1, max:10)	**Mean**	**SS**
	6.57	2.3
	n	**%**
Mild (1-3)	102	9.8
Moderate (4-7)	535	51.4
Severe (8-10)	404	38.8

SS: Standard Deviation; Min:Minimum; Max:Maximum

Factors Affecting Dysmenorrhea

The prevalence of dysmenorrhea among students in the 18-19 age group ($p<0.001$), experiencing stress ($p<0.001$), and using tobacco use ($p<0.05$) was found to be statistically significantly higher than other students (Table 3). The prevalence of dysmenorrhea in those with a bad relationship with their father was statistically significantly higher than in those with a good relationship with their father ($x2=4.90$, $p<0.05$). The prevalence of dysmenorrhea in students who stated that their menstrual cycle was not regular ($p<0.001$), who had a negative attitude towards menarche ($p<0.01$), who had gynecological problems ($p<0.05$), who stated that they used drugs ($p<0.01$), and who had a family history of dysmenorrhea ($p<0.001$) was found to be statistically significantly higher than other participants (Table 3). It was determined that school type, mother's education level, BMI, physical activity, diet, tea-coffee consumption, relationships with mother, sibling, friend, and teacher, age at menarche, and menstrual period did not affect the prevalence of dysmenorrhea.

Ordu University J Nurs Stud
2026, 9(2), 207-219
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Table 3. Prevalence of dysmenorrhea according to students' descriptive and menstrual characteristics

Variables		Dysmenorrhea				
		No		Yes		
		n	%	n	%	p[a]
Age	14-15	39	17.3	187	82.7	**<0.001**
	16-17	69	9.7	639	90.3	
	18-19	11	4.9	215	95.1	
School type	Anatolian high school	33	10.9	270	89.1	0.644
	Religious high school	14	8.3	155	91.7	
	Technical high school	72	10.5	616	89.5	
Education level of the mother	Literate / Illiterate	12	8.6	128	91.4	0.246
	Elementary school	45	9.2	443	90.8	
	Secondary school	34	10.2	299	89.8	
	High school and above	28	14.1	171	85.9	
BMI	Weak	40	10.7	334	89.3	0.910
	Normal weight	60	10.2	527	89.8	
	Overweight and obese	19	9.5	180	90.5	
Physical activity	No	76	10.3	661	89.7	0.937
	Yes	43	10.2	380	89.8	
Stress in your life	No	70	13.4	452	86.6	**0.001**
	Yes	49	7,7	589	92.3	
Diet	3 regular meals	48	11.9	355	88.1	0.344
	2 regular meals	30	10.1	266	89.9	
	Irregular	41	8.9	420	91.1	
Tea/coffee consumption	None	12	15.0	68	85.0	0.347
	1-3 cups	62	9.8	571	90.2	
	4 cups and more	45	10.1	402	89.9	
Tobacco use	No	113	11.1	909	88.9	**0.015**
	Yes	6	4.3	132	95.7	
Relationship with mother	Good	110	10.7	917	89.3	0.274
	Moderate	6	5,7	99	94.3	
	Bad	3	10.7	25	89.3	
Relationship with father	Good	98	11.0	791	89.0	0.082*
	Moderate	18	9.8	166	90.2	*bad>good
	Bad	3	3.4	84	96.6	
Menarche	9-14 age	107	10.2	941	89.8	0.867
	15-17 age	12	10.7	100	89.3	
Menstrual cycle	Irregular	30	6.3	443	93.7	**<0.001**
	Regular	89	13.0	598	87.0	
Menarche attitude	Negative	48	7.7	577	92.3	**0.002**
	Positive	71	13.3	464	86.7	
Gynecological problem	No	116	10.9	951	89.1	**0.020**
	Yes	3	3.2	90	96.8	
Drug use	No	113	11.2	893	88.8	**0.005**
	Yes	6	3.9	148	96.1	
Family dysmenorrhea	No	51	19.2	215	80.8	**<0.001**
	Yes	68	7.6	826	92.4	

[a]*chi-square test.*

Dysmenorrhea Self-Care Experiences

There is a significant difference in ADSCS total score averages students age ($p<0.05$), school type ($p<0.01$), presence of stressful problems ($p<0.05$), age at menarche ($p<0.01$), and pain level ($p<0.001$). In this study, the average ADSCS score of the 14-15 age group was lower than the 16-17 and 18-19 age groups. ADSCS scores of those studying in religious high schools are lower than those studying in Anatolian and technical high schools. The average ADSCS score of students who did not experience stress was lower than that of students who did. The average ADSCS score of those whose menarche age was 9-14 was higher than those whose menarche age was 15-17. Those with a pain level of 4 and above had a higher ADSCS score than those with a pain level of 4 and below (Table 4).

Ordu University J Nurs Stud
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Table 4. Comparison of ADSCS mean scores according to students descriptive and menstrual characteristics

Variables		ADSCS			Statistical analysis	
		n	Mean	SS	t/F	p
Age	14-15[a]	193	130.83	27.35	4.24	**0.020**
	16-17[b]	637	137.73	30.87		
	18-19[c]	211	138.16	30.81		**a<b=c**
School type	Anatolian high school[d]	269	134.39	30.73	4.38	**0.010**
	Religious high school[e]	155	131.56	31.83		**e<f**
	Technical high school[f]	617	138.72	29.59		**d=f**
BMI	Weak	333	137.06	31.43	0.06	0.980
	Normal weight	527	136.25	30.39		
	Overweight	119	136.71	29.40		
	Obese	62	135.81	25.86		
Education level of the mother	Literate / Illiterate	130	136.97	32.18	1.61	0.186
	Elementary school	447	135.61	29.85		
	Secondary school	301	139.40	29.23		
	High school and above	163	133.45	31.91		
Physical activity	No	660	136.59	30.76	0.07	0.942
	Yes	381	136.45	29.61		
Tobacco use	No	912	136.19	30.88	-0.99	0.321
	Yes	129	139.02	26.07		
Stress in your life	No[i]	457	133.96	29.68	2.43	**0.015**
	Yes[j]	584	138.55	30.70		**i<j**
Menarche	9-14 age[k]	938	137.48	30.05	3.05	**0.002**
	15-17 age[l]	103	127.91	31.62		**l<k**
Menarche attitude	Negative	457	137.60	30.60	1.01	0.315
	Positive	584	135.70	30.11		
Pain intensity	1-3[m]	100	123.75	32.89	29.00	**<0.001**
	4-7[n]	523	132.75	29.62		
	8-10[o]	392	144.78	28.43		**m<n=o**
Menstrual cycle	Irregular	438	138.21	30.39	1.52	0.128
	Regular	603	135.32	30.25		

When the multiple logistic regression analysis results are examined in Table 5, dysmenorrhea was found to be statistically significantly associated with age (OR=1.482, %95 CI:1.23-1.79, p<0.001), presence of a stressful problem in one's life (OR=1.520, %95 CI:1.02-2.27, p<0.05), menstrual cycle period (OR=2.044, %95 CI:1.31-3.19, p<0.01), attitude towards menarche (OR=1.598, %95 CI:1.07-2.39, p<0.05), drug use (OR=2.854, %95 CI:1.21-6.75, p<0.05) and presence of dysmenorrhea in the family (OR=2.943, %95 CI:1.96-4.43, p<0.001).

Table 5. Comparison of ADSCS mean scores according to students' descriptive and menstrual characteristics

Variables	B	Exp (B)	%95 CI	p
Age	0.393	1.482	1.23-1.79	**0.000**
Stress in your life (0=No, 1= Yes)	0.419	1.520	1.02-2.27	**0.041**
Menstrual cycle (0=Regular, 1=Irregular)	0.715	2.044	1.31-3.19	**0.002**
Menarche attitude (0=Positive, 1= Negative)	0.469	1.598	1.07-2.39	**0.023**
Drug use (0=No, 1= Yes)	1.049	2.854	1.21-6.75	**0.017**
Family dysmenorrhea (0=No, 1= Yes)	1.080	2.943	1.96-4.43	**0.000**

Hosmer and Lemeshow goodness-of-fit test, p=0.75. Nagelkerke R^2=0.14
Tobacco use, relationship with the father, and gynecological problems were removed from the model because they were unrelated.

Ordu University J Nurs Stud
2026, 9(2), 207-219
DOI:1038108/ouhcd.1564023

Discussion

The present study found that approximately nine out of 10 students experienced dysmenorrhea either occasionally or continuously. The analysis identified several factors that increase the frequency of this condition, including age, the presence of stressful problems, tobacco use, menstrual cycle, attitude towards menarche, presence of gynecological problems, family history of dysmenorrhea, and medication use. The study's findings indicate that self-care practices during menstruation are influenced by factors such as age, school type, the presence of stressful problems, age at menarche, and the intensity of pain experienced.

In this study, the overall prevalence of dysmenorrhea was found to be 89.7%. When the existing literature on the prevalence of dysmenorrhea is examined, it is seen that there are significant differences in the reported figures. For example, the prevalence of dysmenorrhea varies between 16% and 94% in international literature (Pouraliroudbaneh et al., 2024). In studies conducted in Türkiye, the prevalence of dysmenorrhea varies between 69.3% and 94.7% (Kabukcu et al., 2021; Koçoğlu and Zincir, 2021; Sayiner et al., 2017). In this study, the prevalence of dysmenorrhea was found to be consistent with the national average. However, significant differences in the prevalence of this condition may be attributed to cultural differences in the definition of dysmenorrhea, differences in sample sizes of studies, characteristics of study populations, and the lack of standardised measurement tools and common dysmenorrhea criteria. It should be kept in mind that pain is a subjective experience and can be influenced by various factors.

In the present study, which encompassed students between the ages of 14 and 19 years, there was a demonstrable increase in the incidence of dysmenorrhea with advancing age. According to the logistic regression analysis results, dysmenorrhea incidence increased 1.5 times when age increased by one unit. Dysmenorrhea is mainly attributed to the secretion of prostaglandins that induce uterine contractions, reduce uterine blood flow and increase pain sensitivity, which in turn promotes strong uterine contractions, reduced uterine blood flow and subsequent activation of receptors (Ferries-Rowe et al., 2020). In addition, there are studies suggesting that pain begins with menarche and that cycles that are anovulatory can also cause pain (Akman et al., 2021); dysmenorrhea is very common in the first years after menarche and increases with age (Defert et al., 2024). However, there are also studies showing that the prevalence of dysmenorrhea decreases with increasing age (Ameade et al., 2018). At this point, it is important to note that dysmenorrhea typically reaches its highest severity in the first years following menstruation and gradually decreases with advancing age (Ferries-Rowe et al., 2020). Furthermore, in this study, the tendency towards dysmenorrhea self-care practices was observed as the age of the participants increased. As a result, it is predicted that the hormonal effect of the increase in biological age and the fact that individuals have developed a self-care approach will positively affect the incidence of dysmenorrhea.

In the present study, no significant difference was found in terms of dysmenorrhea according to the age at menarche of the participants. In a meta-analysis study, early menarche was identified as a risk factor for dysmenorrhea, and many studies have reported that early menarche increases the prevalence of dysmenorrhea (Karout et al., 2021). It has been stated that longer exposure to prostaglandins may be the reason for this strong relationship (Ferries-Rowe et al., 2020). However, when the dysmenorrhea self-care scores were analysed in this study, it was observed that the age at menarche significantly affected the ADSCS score, and those with a menarche age of 15 and above had lower scores. This result showed that those with late menarche age needed more support in dysmenorrhea self-care. However, self-care practices have a decreasing effect on the prevalence of dysmenorrhea. At this juncture, it is hypothesised that the variables of differences in study design, sample size, biological age and menarcheal age of the sample will elucidate the reasons for the observed differences. At this point, biological age and menarche age should be interpreted meticulously in studies.

In the present study, the rate of dysmenorrhea was found to be twice as high in those who reported irregular menstrual cycles. In previous studies, irregular menstrual cycles have been identified as an important risk factor for dysmenorrhea (Karout et al., 2021). According to the study of Lghoul et al. (2020), the menstrual cycle does not affect dysmenorrhea. According to our results, menstrual cycle irregularity affects hormone levels, especially prostaglandin, and increases the prevalence and severity of dysmenorrhea by causing intrauterine contractions (Ferries-Rowe et al., 2020).

Ordu University J Nurs Stud
2026, 9(2), 207-219
DOI:1038108/ouhcd.1564023

In the present study, when we questioned the symptoms experienced by adolescents during menstruation, very few (4.4%) stated that they did not experience any problems. The first four symptoms were irritability (71%), low back pain (66%), fatigue (62.9%) and abdominal and leg cramps (41.6%), respectively. In a recent study in France, the most common symptoms experienced in early adolescence were abdominal pain (70%), fatigue (48%), difficulty concentrating (26%), headache (25%), digestive disorders (16%) and breast discomfort (11%) (Defert et al., 2024). In a study conducted in Türkiye, the most common symptoms of students during the premenstrual period were anxiety (73.4%), fatigue (72.3%), breast tenderness (71.1%) and appetite changes (70.6%) (Edis and Keten, 2023). Although adolescents have culturally different lives, the symptoms of dysmenorrhea they experience are similar and affect individuals both physically and psychologically.

In the present study, it was determined of the students with dysmenorrhea the mean pain score was 6.57 according to the pain intensity evaluated with VAS. The severity of pain was determined as 6.5 in the study of Özşahin et al. (2022), 5.22 in the study of Kabukcu et al. (2021), and 5.68 in the study of del Prado-Álvarez et al. (2024). Although our study results seem slightly higher than those of the studies conducted abroad, they are similar to those conducted in Türkiye. In the present study, it was determined that dysmenorrhea self-care behaviours increased as pain intensity increased. This result shows that as pain intensity increases, adolescents develop different self-care behaviours to cope with pain. However, it is important to evaluate the level of pain severity holistically, using cultural, medical status, and socioeconomic factors.

High pain severity affects the social and academic lives of adolescents. Severe dysmenorrhea gains importance at this critical stage when adolescents establish social networks (Armour et al., 2019a). In the current situation, it was determined that 83.7% of adolescents do not exercise regularly (Edis and Keten, 2023). Approximately half (41.7%) of the students with dysmenorrhea stated that they were absent from school for one day every month due to this problem (Sahin et al., 2018). Previous research has also revealed that rest is the most popular non-pharmacological approach for pain management (Almanasef and Alqarni, 2023; Armour et al., 2019a). Similar to the study results, 36.3% of the participants in this study stated that they 100% agreed with the statements 'I avoid doing intense exercise when I have period cramps' and 37.7% of the participants in this study stated that they 100% agreed with the statements 'I avoid participating in outdoor activities when I have period cramps'. However, an unhealthy lifestyle contributes to the emergence of dysmenorrhea, and a vicious circle is formed. In addition, it is stated in the literature that dysmenorrhea may negatively affect concentration function (Akduman and Budur, 2016; Barbosa-Silva et al., 2024; Defert et al., 2024) and 31.6% of the students in our study stated that they had concentration problems.

Mental health affects physical health in adolescents with dysmenorrhea. The most common symptoms experienced by most girls with dysmenorrhea (78.9%) are irritability, anxiety and sudden mood changes (Lghoul et al., 2020). Similarly, in a study conducted in Türkiye, anxiety (73.4%) was the most common symptom experienced by students during the premenstrual period (Edis and Keten, 2023). In the present study, 55% of the students stated that a situation in their lives caused intense stress. The incidence of dysmenorrhea was higher in those who experienced stress. According to the results of logistic regression analysis, having a stressful problem in one's life increases the incidence of dysmenorrhea 1.5 times. While stress is an important risk factor for dysmenorrhea in many studies (Kabukcu et al., 2021; Karout et al., 2021), it has been studied as a result in some studies (Kabukcu et al., 2021). However, in our study, students who were exposed to dysmenorrhea by creating a productive effect of stress had a higher tendency towards dysmenorrhea self-care behaviours. This may be related to feeling more pain due to the physical and psychological effects of stress on the body. At the same time, this result may be associated with a higher frequency of dysmenorrhea in people experiencing stress. School nurses should consider conducting comprehensive assessments that include measuring changes in quality of life, anxiety levels, and stress in students experiencing dysmenorrhea.

In the present study, 53.9% of the students had negative attitudes towards menarche. Similar to the literature (Sönmezer and Yosmaoğlu, 2014), the frequency of dysmenorrhea was high in those with negative attitudes towards menarche. According to the logistic regression results, dysmenorrhea was 1.6 times more common in those with negative attitudes towards menarche. While there are physiological factors such as early menarche (Kabukcu et al., 2021; Karout et al., 2021) and the onset of

Ordu University J Nurs Stud
2026, 9(2), 207-219
DOI:1038108/ouhcd.1564023

dysmenorrhea with menarche (Akman et al., 2021), the effect of social structure on women's health content may disadvantage adolescents. According to the results, it is predicted that the negative attitude towards menarche will affect the subconscious mind, create a stress factor at later ages, cause dysmenorrhea and thus create a vicious cycle. Particularly in the adolescent and young adult population, barriers to timely diagnosis and access to effective treatment are evident, and knowledge transfer about women's health, including seeking medical help, may be limited. The widely accepted social normalisation of menstrual pain may contribute to this discrepancy (Söderman et al., 2019), and it is hypothesised that stigma and reluctance to talk about menstruation with health practitioners also play a role. Educating girls prior to menstruation may enable adolescents to learn and identify symptoms of dysmenorrhea, especially suspected pain.

In the present study, 77% of the participants had dysmenorrhea in their mother or sister, and the rate of dysmenorrhea was 2.9 times higher in those with a family history of dysmenorrhea. Similarly, a study conducted in China showed that a history of dysmenorrhea in the mother increased the risk 2.5 times (Hu et al., 2020). A similar result was found in a study conducted in Türkiye, where 48.3% of those with dysmenorrhea had a history of dysmenorrhea in their mother and 15.0% in their sister (Sahin et al., 2018). These results prove that genetic predisposition poses an important risk for dysmenorrhea. Due to this genetic inheritance, women often see dysmenorrhea as an inevitable effect of menstruation, something taboo to discuss and something to be tolerated (Karout et al., 2021). In Sweden, the tendency to seek medical help from a doctor has decreased from 22% to 7% compared to 1982, which may be a sign of normalising dysmenorrhea (Söderman et al., 2019). More than 50% of women adopt self-care strategies that they can use without consulting a specialist as the first step in managing dysmenorrhea (Karout et al., 2021). At this point, the inclusion of female family members in adolescent-oriented studies to be carried out by a multidisciplinary team under the leadership of a school health nurse may provide an opportunity to improve women's health. Practices that bring family members together can increase applicability and social acceptance.

Current studies show that non-pharmacological and pharmacological methods are used for dysmenorrhea. When the measures taken against dysmenorrhea were evaluated, it was found that 53.3% of adolescents used painkillers, 28.3% applied to the emergency department (Sahin et al., 2018). In a study conducted in Lebanon, it was reported that the majority of women (76.4%) took analgesics for dysmenorrhea (Karout et al., 2021). In a study conducted in Türkiye, 41.5% of adolescents use painkillers (Koçoğlu and Zincir, 2021). In our study, it was found that 13.3% of them used medication. In logistic regression analysis, dysmenorrhea was 2.9 times more common in drug users. Among girls 10% felt discomfort despite using painkillers (Defert et al., 2024). It is an important problem for adolescents to use recommended medications for dysmenorrhea without professional support, to recommend their medication to someone else among their friends, not paying attention to the recommended duration of drug use and exposure to side effects (Söderman et al., 2019).

According to the research results, there is a tendency towards non-pharmacological drug treatment against the side effects of drugs in self-care practices for dysmenorrhea in adolescents (Parra-Fernánde et al., 2020). In a related study, more than half of the participants preferred home remedies (e.g. heat therapy, massages, herbal teas, hot drinks) to manage dysmenorrhea (Pouraliroudbaneh et al., 2024). In Türkiye, rest/relaxation (80.6%), warm application to the abdomen (54.8%), and massage (34.6%) were determined as the techniques used to reduce pain (Koçoğlu and Zincir, 2021). The dysmenorrhea self-care behaviour that the students participating in our study applied at the highest rate were 'I wear loose clothing when I have period cramps', 'I know clearly which of the uncomfortable area would occur when I have my period', 'I wear warm clothing when I have period pain', 'I eat more chocolate or other sweet food when I have period cramps' and 'I massage the site of pain when I have period cramps'. The lowest rates were found as 'I look up reports and articles related to period cramps in books and magazines' and 'At school, I ask the teachers for help in dealing with period cramp problems'. The results show that adolescents do not receive environmental support in self-care behaviours and prefer individual self-care methods. These variations are thought to arise from differences among the participants in the study attributed to country and socio-demographic characteristics. It is thought that this situation also affects the prevalence values of dysmenorrhea and

Ordu University J Nurs Stud
2026, 9(2), 207-219
DOI:1038108/ouhcd.1564023

causes social isolation and ineffective self-care practices in young people.

This study used data from a large population group to assess dysmenorrhea self-care subscales. The study design, which focused on a young adolescent population, did not allow for the assessment of the distinction between primary and secondary dysmenorrhea. In order to differentiate between primary dysmenorrhea and secondary dysmenorrhea, the gynaecological examination was not performed. As the study did not include a community-based group, it is impossible to generalise the results due to the influence of socio-cultural and economic factors on dysmenorrhea and self-care practices. As universal descriptive criteria for dysmenorrhea do not exist, the study relied mainly on adolescents' self-reports of painful menstruation, which may be susceptible to social acceptance bias, as data were collected based on personal responses through a questionnaire.

Conclusions

In this study, the prevalence of dysmenorrhea was found to be 89.7%. Dysmenorrhea in adolescents is affected by age, presence of stressful problems, tobacco use, menstrual cycle, attitude towards menarche, drug use, presence of gynaecological problems and family history of dysmenorrhea. In addition, dysmenorrhea self-care behaviours were affected by the presence of stressful problems, pain level, age, age at menarche and type of school. It is recommended that reproductive health and menstruation education should start before adolescence, and health programmes should be updated to include dysmenorrhea self-care under the title of reproductive health. As a sample practice, it is recommended that health professionals provide menstrual health education to adolescents and family members with online/face-to-face sessions with content appropriate for the adolescent age group. It is recommended that interventions should be made for stress, drug use, and negative attitudes towards menarche, which have modifiable characteristics that have the potential to affect dysmenorrhea and self-care behaviours. For example, educational activities that encourage social support mechanisms for dysmenorrhea and include easy access are recommended. Intervention studies, including individual/group education (such as peer-assisted) for stress and anxiety levels, are recommended. School health nurses can provide interventions for dysmenorrhea with evidence-based non-drug methods. For example, it is recommended to increase the number of non-pharmacological self-care intervention studies (body/mind/awareness exercises, lifestyle change practices) for dysmenorrhea in the adolescent group. Dysmenorrhea and pelvic pain are generally considered chronic conditions and often occur cyclically; therefore, longitudinal studies that will provide more detailed information will provide more predictable results for dysmenorrhea projection. Furthermore, the long-term effects of intervention studies must be followed up with longitudinal study results. It should be supported by qualitative studies to estimate the causal implications of the findings.

Ethics Committee Approval: The tenets of the Declaration of Helsinki completed this study. Before the research, XXX University ethics committee approval (06.02.2017-63) and necessary permissions were obtained from the XXX Provincial Directorate of National Education. Institutional and parental permissions were obtained for the research. Participants were informed about the purpose of the research, and verbal consent was obtained.

Author Contributions: Concept: ES, AE; Design: ES, AE; Consulting/Supervision: AE; Data collection and/or processing: ES; Data analysis and/or interpretation: ES, AE; Literature search: ES, AE; Article writing: ES, AE; Critical review: ES, AE.

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What did the study add to the literature?

- In this study, the prevalence of dysmenorrhea is quite high in high school adolescents.
- Many of the factors affecting dysmenorrhea in adolescents aged 14-19 years, such as stress, negative attitudes towards menarche and medication use, can be influenced and modified by lifestyle changes.
- Adolescents at the high school level often develop individual self-care strategies. This is a testament to their personal growth. Although peer sharing is expected to come to the fore in this period, individual strategy formation initiatives have a remarkable feature.
- The research results suggest that issues related to dysmenorrhea and its management predict that participants may take an ineffective approach to women's health issues in the future and should motivate us to take action.

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