The Relationship between Anxiety Levels and Menstruation Symptoms in Adolescents

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ABSTRACT

Objective: The aim of the study is to determine the relationship between anxiety levels and menstrual symptoms in adolescents. **Material and Methods:** The research is a descriptive and relationship-seeking research. 602 adolescents studying in two schools were invited to the study. The sample group of the study consisted of 544 adolescents who agreed to participate in the research. Data was collected using a personal information form, Menstrual Symptom Questionnaire, and Beck Anxiety Inventory. The relationship between two continuous variables was evaluated with the Pearson Correlation Coefficient. Statistical significance level was considered as p<0.05. **Results:** The BAI Subjective Anxiety subscale mean score was 28.49±8.28, the Somatic Symptom subscale mean score was 17.16±5.60, and the total mean score was 45.65±13.07. MSQ Negative effects/somatic complaints subscale mean score 33.75±10.59, pain subscale mean score 20.92±6.74, coping subscale mean score 62.64±18.59, and total mean score was 117.36±34.44. **Conclusion:** There is a positive, moderate level and statistically significant relationship between Menstrual Symptom Questionnaire total score and Beck Anxiety Inventory total score. Anxiety level does affect menstrual symptoms in adolescents.

Keywords: Adolescent, Anxiety, Menstrual Symptoms, Nurse.

Adolesanlarda Anksiyete Düzeyleri ile Menstruasyon Semptomları Arasındaki İlişki

ÖZ

Amaç: Bu araştırmanın amacı, adolesanlarda anksiyete düzeyi ile menstruasyon belirtileri arasındaki ilişkiyi incelemektir. **Gereç ve Yöntem:** Araştırma, tanımlayıcı ve ilişki arayıcı bir araştırmadır. İki okulda öğrenim gören 602 adolesan araştırmaya davet edildi. Araştırmaya katılmayı kabul eden 544 adolesan araştırmanın örneklem grubunu oluştudu Veriler kişisel bilgi formu, Menstruasyon Semptom Ölçeği ve Beck Anksiyete Envanteri kullanılarak toplandı. İki sürekli değişken arasındaki ilişki Pearson Korelasyon Katsayısı ile değerlendirildi. p<0.05 düzeyi istatistiksel olarak anlamlı kabul edildi. **Bulgular:** Beck Anksiyete Ölçeği Öznel Anksiyete alt boyutu puan ortalaması 28.49±8.28, Bedensel Belirti alt boyutu puanı ortalaması 17.16±5.60 ve toplam puan ortalaması 45.65±13.07 idi. Mensturasyon Semptom Anketi Olumsuz etkiler/bedensel yakınmalar alt boyutu puan ortalaması 33.75±10,59, ağrı alt boyutu puanı ortalaması 20.92±6.74, başa çıkma alt boyutu puanı ortalaması 62.64±18.59 ve toplam puanı 117.36±34.44 idi. **Sonuç:** Menstrual Semptom Ölçeği toplam puanı ile Beck Anksiyete Ölçeği toplam puanı arasında pozitif, orta düzey ve istatistiksel olarak anlamlı bir ilişki vardır. Anksiyete düzeyi adolesanlarda menstruasyon semptomlarını etkilemektedir.

Anahtar Kelimeler: Adolesan, Anksiyete Düzeyi, Menstruasyon Belirtileri, Hemşire.

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INTRODUCTION

Menstruation, which starts with menarche and ends with menopause, is an integral part of women's health (Thiyagarajan, Basit, & Jeanmonod, 2021). The normal duration of menstrual bleeding is 3-5 days, but it is also normal for a woman to be as short as 1 day and as long as 8 days (Mínguez-Alarcón et al., 2022; Thiyagarajan et al., 2021). Menstruation affects physical, mental and social well-being in millions of women worldwide (Critchley et al., 2020). Attitudes towards menstruation are shaped by personal experience, knowledge, social learning, and cultural beliefs (Wong & Khoo, 2011). Menarche and menstrual management are frequently associated with concepts of privacy, fear, embarrassment, sexual vulnerability, positive/negative attitudes, myths and taboos, and sociocultural constraints in low- and middle-income countries, according to a coverage review examining puberty and menstruation among young adolescents (Coast, Lattof, & Strong, 2019). Most research focuses on the negative aspects of menstruation and premenstrual experiences (Munro et al., 2021; Siahbazi et al., 2018).

About half of women experience emotional symptoms during the premenstrual period. Other common menstrual disorders are dysmenorrhea and irregular menstrual bleeding (Direkvand-Moghadam et al., 2014). Studies have reported that the prevalence of menstrual symptoms is high, and the most prominent symptoms are dysmenorrhea, psychological complaints, and fatigue (Schoep et al., 2019). In another study, it was found that menstrual cycle irregularity shortens sleep time and causes depressive mood in adolescents (Nam, Han, & Lee, 2017), and there is a relationship between menstrual pain and depression (Takeuchi, Oishi, & Harada, 2005). Anxiety is the most common mental disorder among adolescents. The anxiety rate among adolescents in the United States is very high and continues to rise over time (Goodwin et al, 2020; Merikangas et al., 2010). Anxiety rates are higher in girls than boys (De France, Hancock, Stack, Serbin, & Hollenstein, 2022; Ho, Dai, Mak, Liu, & Psychology, 2018). Being exposed to negative psychosocial experiences such as anxiety at an early age increases the susceptibility to permanent emotional, immune system and metabolic diseases in later life (Danese et al., 2009). It is important to provide early interventions in hopes to mitigate anxiety symptoms to alleviate the problems that may arise in the following years (Ho et al., 2018). The aim of the study is to determine the relationship between anxiety levels and menstrual symptoms in adolescents.

Research questions

What is the level of anxiety in adolescents?
What is the level of menstrual symptoms in adolescents?
What is the relationship between anxiety level and menstrual symptoms in adolescents?

MATERIALS AND METHODS

Type of research

This research is a cross-sectional research type that looks for a relationship from descriptive research.

Place and time of research

The research was conducted with 12th grade female students studying in four high schools in a city located in Central Anatolia. Interviews with students for the research were held between 20 April and 30 May 2022. 12th-grade students in Turkey are in an intense preparation period for the university exam. Therefore, the 12th grade period is a year when anxiety can be high for students. Therefore, data were collected from 12th grade students.

Sample design

The population of the study consisted of 12th grade students of four high schools in two different central districts of Konya province. It was determined that the population size of the research consisted of 602 adolescents. Sample selection was not made in the study and all students enrolled in the 12th grade of four high schools in the 2021-2022 academic year and who met the inclusion criteria were included in the study. 544 adolescents (n=544) who agreed to participate in the research formed the sample group of the research. The rate of participation in the research was 90.3%.

Dependent and independent variables

The age of the adolescents, the education level of the parents, the age of the first menstruation, the menstrual cycle interval, the duration of menstruation, and the level of anxiety were independent variables, whereas menstrual symptoms were dependent variables.

Data collection

Personal Information Form: Socio-demographic questions consisted of the adolescents' age, income level, mother's education level, father's education level, family type, age at menarche, menstruation pattern, how often menstruation occurs, how many days the menstruation period is, and anxiety level. It consisted of 10 questions containing personal information.

Beck Anxiety Inventory (BAI): This scale used in the research is used to determine the level of anxiety in individuals. The scale items are four-point Likert type and consist of 21 items. Scale items are scored between 0 and 3 points. A high score on the scale indicates that the anxiety level of the participant is high. A score between 0 and 7 points defines a minimal or normal anxiety level, a score between 8 and 15 points indicates a mild anxiety level, a score between 16 and 25 points indicates a moderate anxiety level, and a score between 26 and 63 points indicates a severe anxiety level. The Turkish validity and reliability study of the scale was conducted by Ulusoy et al. in 1998. It was determined that the scale has sufficient validity and reliability for use in our country. The internal consistency coefficient value for the BAI total score is 0.905 (Ulusoy, Şahin, & Erkmen 1998).

Menstrual Symptom Questionnaire (MSQ): The scale was first developed by Chesney and Tasto (1975) to assess menstrual pain and symptoms. Cronbach's Alpha value of the scale is 0.86 (Chesney & Tasto 1975). The scale was adapted to Turkish by Güvenç et al. (2014) (Guvenc, Seven, & Akyüz, 2014). Consisting of 22 items, this scale is a five-

point Likert-type scale. The items in the scale are scored between 1 and 5 points. The adolescents who participated in the study scored "never" as 1 and "always" as 5 according to the symptoms they experienced related to menstruation. The higher the average score obtained from the scale, the higher the severity of menstrual symptoms. Items 1-13 were included in the "Negative effects/somatic complaints" sub-dimension, items 14-19 were included in the "Menstrual pain symptoms" sub-dimension, and items 20-22 were included in the "Coping methods" sub-dimension. The scores obtained from the sub-dimensions of the scale indicate the severity of menstrual symptoms in that sub-dimension. The internal consistency value of the total score obtained from the MSQ is 0.917.

Data collection: The questionnaire was applied face-to-face by the researchers in the schools. In order to enable face-to-face interviews, only female students were asked not to leave the classroom after the end of each lesson. Questionnaires were distributed by the researchers while the students were in their classrooms. These forms, which are self-reported questionnaires, were answered by each student by reading them. Data collection for a class took an average of 10-15 minutes.

Statistical analyses of data

The data obtained from adolescents were analysed using SPPS 25 software. Descriptive statistics were given for continuous and categorical variables. The normal distribution between the variables was analysed by "Shapiro-Wilk" and the homogeneity of the distribution was analysed by Levene's test. Pearson Correlation analysis was used to determine the correlation between two variables with normal distribution, and variables without normal distribution were evaluated by Spearman Correlation Coefficient. $p < 0.05$ level was considered statistically significant.

Ethical considerations

Before the study was started, ethics committee approval number 04 was obtained from the institutional ethics committee of Karatay University on 15.04.2022 (2022/013). Verbal and written permission was obtained from the high school principals. A statement was made that the adolescents were free to participate or not participate in the research. After the adolescents participating in the study and their families were informed about the research, verbal and written consent was obtained. While conducting the research, the Declaration of Helsinki was followed.

RESULTS

The statistical results of the data obtained from 544 adolescents participating in the study were determined. It was determined that the mean age of the adolescents participating in the research was 17.60±0.70, the mean age of menarche were 13.32±1.18. It was observed that 77.60% of the adolescents lived in a nuclear family, 72.10% of their mothers and 50.70% of their fathers had a primary school graduation at most. When the income level was evaluated, it was determined that 64% of them were equal to their expenses. 70.20% of the participants stated that their menstruation was in a regular period, 28% consulted a doctor because of a problem related to menstruation, 61.40% stated that the menstrual frequency ranged between 21-28 days, and 76.80% stated that their period of menstruation ranged from 5-7 days. Adolescents were asked to evaluate their perceptions of their anxiety level, and 63.60% of them stated their anxiety as moderate (Table 1).

BAI and MSQ total scores and sub-dimensions scores are given in Table 2. Accordingly, the BAI Subjective Anxiety sub-dimension mean score was 28.49±8.28, the Somatic Symptom sub-dimension mean score was 17.16±5.60, and the total score average was 45.65±13.07. MSQ Negative effects/somatic complaints subscale mean score 33.75±10.59, Menstrual pain symptoms subscale mean score 20.92±6.74, Coping methods subscale mean score 62.64±18.59, and total score mean 117.36±34.44 (Table 2).

In Table 3, there is a statistically significant positive correlation between BAI and its sub-dimensions ($p < 0.001$). The correlation between the scale total score and the subjective anxiety sub-dimension is higher. There was a high level of statistically significant positive correlation between MSQ and its sub-dimensions ($p < 0.001$). It was determined that the highest correlation between MSQ total score and its sub-dimensions was between coping methods, and the lowest relationship was between menstrual pain symptoms. There was a positive, moderate and statistically significant correlation between MSQ total score and BAI total score ($p < 0.001$) (Table 3).

Table 1. Socio-demographic Characteristics of the Participants (n=544).

Variables	Frequencies		Variables	Frequencies	
	Mean±SD	**Min-Max**		**Mean±SD**	**Min-Max**
Age, years	17.60 ±0.70	15-20	**Age of menarche**	13.32 ± 1.18	10-16
	n	**%**		**n**	**%**
Family type			**Seeing a doctor for menstrual complaints**		
Nuclear family	422	77.6			
Extended family	98	18.0	Yes	152	28
Single Parent family	24	4.4	No	392	72

Table 1. (Continue) Socio-demographic Characteristics of the Participants (n=544).

Mother's education level			Menstruation frequency (days)		
Primary school	392	72.1	15-20	100	18.4
Middle School	84	15.4	21-28	344	61.4
High school	44	8.1	Longer than 28 days	110	20.2
Licence	24	4.4			
Father's education level			**Period of menstruation (day)**		
Primary school	276	50.7	3-4	70	12.9
Middle School	128	23.5	5-7	418	76.8
High school	96	17.6	8-10	52	9.6
Licence	44	8.1	Longer than 10 days	4	0.7
Income perception			**Anxiety level perception**		
Less income	118	21.7	Light	106	19.5
Equal income	348	64.0	Middle	346	63.6
More income	78	14.3	Severe	92	16.9
Menstruation pattern					
Regular	382	70.2			
Irreguler	162	29.8			
Total	**544**	**100**	**Total**	**544**	**100**

Summary statistics are given as mean±standard deviation, minimum-maximum value

Table 2. BAI and MSQ total scores and sub-dimensions scores (n=544).

Scales and sub-dimensions	Mean±SD	Min-Maks	Cronbach's Alpha
Subjective Anxiety	28.49±8.28	14.00-50.00	0.85
Somatic Symptom	17.16±5.60	8.00-32.00	0.82
BAI Total Score	45.65±13.07	22.00-80.00	0.91
Negative effects/somatic complaints	33.75±10.59	12.00-60.00	0.87
Menstrual pain symptoms	20.92±6.74	6.00-30.00	0.85
Coping methods	62.64±18.59	21.00-103.00	0.76
MSQ Total Score	117.36±34.44	39.00-191.00	0.92

Summary statistics are given as mean±standard deviation, minimum-maximum value, Cronbach's Alpha.

Table 3. Relationship Between BAI, MSQ and Sub-Dimensions (n=544).

		Subjective anxiety	Somatic symptom	BAI Total Score	Negative effects/somatic complaints	Menstrual pain symptoms	Coping methods	MSQ Total Score
Somatic symptom	r	0.767**	1	0.914**	0.417**	0.386**	0.434**	0.437**
	p	0.000		0.000	0.000	0.000	0.000	0.000
BAI Total Score	r	0.962**	0.914**	1	0.448**	0.427**	0.469**	0.474**
	p	0.000	0.000		0.000	0.000	0.000	0.000
Negative effects/somatic complaints	r	0.426**	0.417**	0.448**	1	0.693**	0.936**	0.948**
	p	0.000	0.000	0.000		0.000	0.000	0.000
Menstrual pain symptoms	r	0.413**	0.386**	0.427**	0.693**	1	0.871**	0.878**
	p	0.000	0.000	0.000	0.000		0.000	0.000
Coping methods	r	0.447**	0.434**	0.469**	0.936**	0.871**	1	0.997**
	p	0.000	0.000	0.000	0.000	0.000		0.000
MSQ Total Score	r	0.452**	0.437**	0.474**	0.948**	0.878**	0.997**	1
	p	0.000	0.000	0.000	0.000	0.000	0.000	

*$p<0.05$; **$p<0.001$ 1: Pearson Correlation Coefficient (r); Summary statistics are given as r (p) values.*

DISCUSSION

This research was conducted with female adolescents who are preparing for university entrance exams in Turkey, and therefore these adolescents are under intense stress. Adolescents in Turkey go through a tough exam process at the end of high school in grade 12 for university placement. Families and society expect young people to achieve a high score in order to be placed into a competitive program in a good university. It has been estimated that being in the adolescence period, going through the COVID-19 process, and/or preparing for the university exam may be the reasons that may cause anxiety in younger individuals, or it may increase existing anxiety levels. The aim of the study is to determine the relationship between anxiety levels and menstrual symptoms in adolescents.

In the study, it was found that the majority of the participants had regular menstrual cycles and the menstruation period continued for 5-7 days, and more than half of the subjects started the process every 21-28 days. Our research results are similar to the results of studies conducted with adolescent women (Öztürk & Güneri 2021; Rabiepoor, Valizadeh, & Barjasteh, 2017) In our study, adolescents were asked to determine their own anxiety levels. The vast majority of adolescents stated their anxiety as moderate. However, it was found that they had severe anxiety level (45.65±13.07) according to their BAI score. This is important because it shows that adolescents are not aware of how severe their anxiety level is. In the study, nearly one-third of the participants reported that they consulted a doctor because of menstruation complaints. Our research results are similar to the study results of Öztürk & Er Güneri (2021).

In the study, it was found that the mean BAI scale total score of the participants was 45.65±13.07, the average of the subjective anxiety sub-dimension was 28.49±8.28, and the mean of the somatic symptom sub-dimension was 17.16±5.60. Accordingly, the anxiety levels of the adolescents participating in our study were quite high. A study found that there is a relationship between premenstrual symptoms and anxiety level (Topel & Pehlivan, 2021).

In the study, it was found that the MSQ total score average of the participants was 117.36±34.44, the Negative effects/somatic complaints sub-dimension was 33.75±10.59, the menstrual pain symptoms sub-dimension was 20.92±6.74, and the coping methods sub-dimension was 62.64±18.59. In a study, the mean MSQ score was calculated as 69.84±15.48, Negative effects/somatic complaints sub-dimension 40.96±9.64, menstrual pain symptoms sub-dimension 21.06±5.18, coping methods sub-dimension 7.78±3.31 and it was interpreted that menstruation symptoms were severe. Accordingly, the adolescents participating in our study have a much higher menstruation symptom severity, but their coping methods sub-dimension mean scores are also much higher. It can be said that the adolescents participating in our study were able to cope with the symptoms they experienced. No significant relationship was found between the level of education of the parents, family type, income perception, frequency and duration of menstruation, and the mean MSQ score of the adolescents. In a study, it was found that there was a significant relationship between the education level of the mother, the education level of the father, and the MSQ score averages (Öztürk & Güneri 2021). In the study, there was a strong positive correlation between the MSQ total score and its sub-dimensions (p<0.05). There was a strong positive correlation between the BAI total score and its sub-dimensions (p<0.05). In the study, the sample group was selected from the group studying for the university exam, which has a very high stress factor especially for adolescents. As expected at the beginning of the research, the anxiety level of the adolescents was very high. Moderate, positive correlations were found between MSQ total score and BAI total score (p<0.05). This finding is important as it shows that the level of anxiety in adolescents does affect menstrual symptoms. This finding is important as it shows that the level of anxiety in adolescents does affect menstrual symptoms.

CONCLUSION

Adolescents experience menstrual symptoms and anxiety symptoms at high levels. There is a moderate relationship between menstrual symptoms and anxiety symptoms. It is recommended to conduct studies showing the extent to which menstrual symptoms affect anxiety symptoms. Public health nurses and pediatric nurses should provide counseling and care to adolescents regarding menstrual symptoms and coping methods.

Strengths

The strength of the research is that the research data were collected from four high schools at different levels in the central districts of a large city in Central Anatolia.

Limitation of study

There were limitations of our study. Firstly, the sample size of this study was not large enough to generalize the data extracted. Not using a method for sample selection in the research is a limitation. The presence of the Covid-19 pandemic may have been a confounding factor for the level of anxiety. In addition, participants' answers were identified by surveys, so findings were dependent on participants' statements.

Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Author Contributions

Plan, design: FDT, BB; **Material, methods and data collection:** FDT, BB; **Data analysis and comments:** FDT, BB; **Writing and corrections:** FDT, BB.

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