Relationship between perceived stress level with menstruation symptoms and quality of life in women

Stress and menstruation symptoms

Aybüke Ersin, Sena Öndeş

Department of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Istanbul Atlas University, Istanbul, Turkey

Abstract

Aim: The aim of the study is to investigate the relationship between perceived stress level, menstrual symptoms and quality of life in women aged between 18-50 years.

Material and Methods: This study was carried out with the participation of 172 volunteers. The Perceived Stress Scale was used to evaluate the stress levels of the participants, the Menstruation Symptom Scale was used to evaluate the menstrual symptoms, and the Short Form-36 was used to evaluate the quality of life. Simple Linear Regression Analysis was used to examine the effects of demographic characteristics of the participants on menstrual symptoms, and Pearson's or Spearman's Correlation Analyzes were performed in accordance with the distribution of the data to determine the relationship between perceived stress level, menstrual symptoms, and quality of life.

Results: The results of our study show that smoking increases menstrual symptoms (p=0.022). Perceived stress level was found to be correlated with all sub-parameters of the Menstruation Symptom Scale at a low level (p<0.05). It was found that there was a moderate and negative correlation with all Short Form-36 sub-parameters, except for the Short Form-36 physical function sub-parameter (p<0.05).

Discussion: Our study showed that menstrual symptoms tend to increase as the perceived stress level in women increases. In addition, it has been revealed that the increase in stress level and menstrual symptoms negatively affects the quality of life of women. According to the results of our study, it is recommended that future studies examine the effects of stress reduction practices on women's menstrual symptoms and quality of life.

Keywords

Perceived Stress Level, Menstruation Symptoms, Quality of Life

Introduction

The physiological changes that occur regularly every month with the changes in hormones during the period from menarche to menopause to provide reproductive functions in women are called the menstrual cycle [1]. Premenstrual symptoms are generally defined as irritability, moodiness, breast tenderness, and skin disorders. Besides, the most common symptoms seen during menstruation are abdominal pain, lower back pain, and cramps. These symptoms are accompanied by fatigue, weakness, nausea, and vomiting [2]. These symptoms are referred to as an umbrella term, dysmenorrhea, which consists of severe painful cramping in the lower abdomen, often concomitant with sweating, tachycardia, headache, nausea, vomiting, diarrhea, and tremulousness occurring just before or during the menses. Its prevalence is between 20% and 90% [3]. Dysmenorrhea alters body awareness and daily life activities, reduces work efficiency, work quality, and self-confidence, causes economic losses and risk of work accidents, influences negatively social relations, attendance to classes, and reaching educational goals [4]. Menstruation symptoms are one of the main reasons for absenteeism from school among young women [5]. A study conducted with adolescent women has shown that increased depression, anxiety, and stress levels and symptoms such as low back pain, early fatigue, muscle pain, and dizziness increased one week before, during, and one week after the menstrual period [2]. The level of stress was found to be related with premenstrual symptoms, menstrual pain, and menstrual cycle irregularities, which limited the functional activities of the university students [6]. The need for hours of rest and difficulty in studying have been revealed. Menstrual symptoms affect the women's quality of life negatively [7]. Furthermore, menstrual irregularity, dysmenorrhea, and premenstrual syndrome, which impair the quality of life, and are also risk factors for future health problems, may occur as a result of the increased stress levels in university students [8,9].

According to the literature, determining the physical, psychological, and social effects of stress-related symptoms associated with menstruation may provide information to prevent a reduction in the quality of life. Therefore, the aim of our study is to investigate the effect of perceived stress levels on menstrual symptoms and to determine the effect of perceived stress levels and menstrual symptoms on the quality of life in women.

Material and Methods

Participants

This cross-sectional study was conducted in Istanbul in March 2022. The sample of the study consisted of non-menopausal women between the ages of 18-50. The needed sample size was calculated by using G*Power software. For the correlation analyses, a medium effect size of 0.3 was hypothesized, with α =0.05 and a sample size of 114, resulting in a power of .906 [10]. Post hoc power was calculated using the effect size of the study and the power was found to be 95%. The study involved 192 women. Women who have been diagnosed with pregnancy, polycystic ovary syndrome, thyroid dysfunction, psychological disorders, fibromyalgia, neurological deficit, reproductive system diseases such as endometriosis, ovarian cysts, chronic pelvic pain, and pelvic inflammatory disease were excluded. The status of the participants is shown in Figure 1.

Study Design

All the assessment forms were delivered to the participants via e-mail, social media platforms such as Facebook, Instagram, LinkedIn, and networks via Google surveys. All participants who voluntarily participated in the study were informed about the purpose and content of the study with a voluntary consent form, and their consent was obtained. Ethical approval was obtained for this study from the Non-Interventional Scientific Research Ethics Committee with the date 30-03-2022 and the decision number E-22686390-050.01.04-13570.

Outcome Measurements

Demographic information was collected via a form that includes questions about age, occupation, body mass index, number of births, chronic illness, and existing reproductive system diseases.

The Perceived Stress Scale (PSS) was used to measure the perceived stress levels of the participants. This scale was developed by Cohen, Kamarck, and Mermelstein in 1983. Turkish validity and reliability of PSS were performed by Eskin et al. The scale contains 14 questions in a 5-likert type. Scoring for each question varies from "never (0)" to "very often (5)". Seven questions are scored in reverse. There are also short forms consisting of 10 and 4 questions. The scale has two subgroups, namely self-efficacy and stress perception. The questions measure people's perception of stress experienced in different situations in the last month. On this scale, questions 4-5-6-7-9-10 and 13 are scored in reverse order. The lowest and highest scores a participant can obtain on this scale are 0 and 56, respectively. A high total score means a high perceived stress level. [11,12].

The Menstruation Symptom Scale (MSS) was used to determine menstrual symptoms. The Turkish validity and reliability study of the scale, which was developed by Chesney and Tasto in 1975, was performed by Güvenç et al. in 2014. The scale consists of 22 questions in a 5-likert type. Scoring ranges from "never (1)" to "always (5)". It has 3 sub-dimensions: Negative Effects/Somatic Complaints, Menstrual Pain, and Methods of Coping with Menstrual Pain. The MSS score is calculated by taking the total average score of the questions. An increase in the mean score indicates an increase in the severity of menstrual symptoms. [3,13].

The Short Form-36 (SF-36) Quality of Life Questionnaire was used to evaluate the quality of life. This questionnaire was developed by Ware in 1999. The Turkish validity and reliability study was performed by Koçyiğit et al. in 1999. The scale consists of 36 questions and 8 subgroups. These are physical functioning, role-physical, role-emotional, vitality, mental health, social functioning, pain, and general health. The scale does not have a total score. For each subgroup, a score varying between 0 and 100 is available. The higher the score, the higher the quality of life [14,15].

Statistical Analysis

Statistical analyzes were performed using the SPSS program (Statistical Package for the Social Sciences, version 26.0. SPSS Inc, Chicago). The distribution of the data was determined by the Kolmogorov-Smirnov test. All data collected from participants

were presented with mean and standard deviation values. The effects of the demographic characteristics of the participants on menstrual symptoms were determined via Simple Linear Regression Analysis. The relationship between perceived stress level, menstruation symptoms and quality of life was examined by Pearson's or Spearman's Correlation analysis, in accordance with the distribution of data. The significance level p was defined as 0.05.

Ethical Approval

Ethics Committee approval for the study was obtained.

Results

A total of 192 women aged between 18-50 years were included in the study. The demographic characteristics of the participants are shown in Table 1. Thirteen individuals were excluded from the study because of polycystic ovary syndrome, 1 had neurological deficit, 1 had fibromyalgia, and 6 had thyroid dysfunction. Statistical analysis was performed for 171 individuals. 34% of the individuals were smokers. In the analysis, it was determined that only smoking among demographic characteristics affected menstrual symptoms (p=0.022) (Table 1).

A statistically significant relationship was found between the negative effects of perceived stress level on menstrual symptoms, menstrual pain, methods of coping with menstruation and general menstruation symptoms (p<0.05). The relationship between perceived stress level and menstrual symptoms and quality of life is given in Table 2.

The relationship between the Menstruation Symptoms Scale total score and SF-36 Short Form sub-parameters, role-physical, role-emotional, vitality, mental health, social functioning, bodily pain, and general health perception was statistically significant (p< 0.05) (Table 2).

There was also an association between perceived stress level and SF-36 Short Form sub-parameters, role-physical, role-emotional, vitality, mental health, social functioning, bodily pain and general health. There was no statistically significant correlation between physical functioning score, which is the SF-36 Short Form sub-parameter, with perceived stress level and menstrual symptoms (p>0.05) (Table 2).
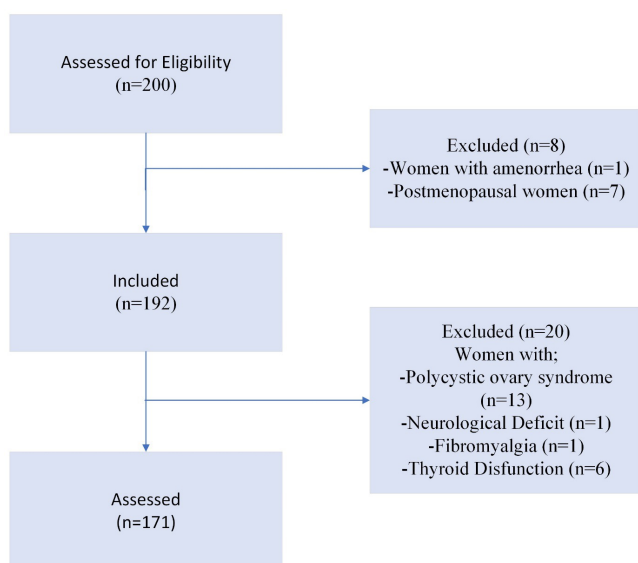
Table 1. Demographic features of the participants and their effects on the menstrual symptom scale.

Features	Mean ± Standard Deviation (n=171)	R	R²	Adjusted R	F	p
Age (years)	25.54 ± 7.3	0.162	0.026	0.021	4.559	0.034
BMI (kg/m²)	22.47 ± 4.41	0.047	0.002	-0.004	0.382	0.538
Marital Status (Married/Single)	27/144	0.091	0.008	0.002	1.421	0.235
Parity (Yes/No)	19/152	0.113	0.013	0.007	2.198	0.140
Smoking (Yes/No)	47/124	0.174	0.030	0.025	5.304	0.022*

*p<0.05 statistical significance. Simple Linear Regression Analysis.

Table 2. Relationship between perceived stress level with menstruation symptoms and quality of life.

	Mean ± SD	Correlation with PSS		Correlation with MSS	
		r	p	r	p
PSS	29,02 ± 7,7	-	-	0.399	<0.001*
MSS Negative Effects/ Somatic Complaints	3,01 ± 0.8	0.394	<0.001*	-	-
MSS Menstrual Pain	3,24 ± 0.9	0.325	<0.001*	-	-
MSS Methods of Coping with Menstrual Pain	2,63 ± 1,2	0.304	<0.001*	-	-
MSS Total Score	2,95 ± 0.7	0.399	<0.001*	-	-
SF - 36 Physical Functioning	87,83 ± 16,7	-0.120	0.117	-0.049	0.527
SF - 36 Role-Physical	60.38 ± 38,8	-0.300	<0.001*	-0.180	0.019*
SF - 36 Role-Emotional	44,23 ± 41,7	-0.445	<0.001*	-0.270	<0.001*
SF - 36 Vitality	40.96 ± 21,7	-0.642	<0.001*	-0.349	<0.001*
SF - 36 Mental Health	50.34 ± 21,7	-0.668	<0.001*	-0.398	<0.001*
SF - 36 Social Functioning	57,38 ± 24,1	-0.492	<0.001*	-0.382	<0.001*
SF - 36 Bodily Pain	72,90 ± 13,6	-0.292	<0.001*	-0.413	<0.001*
SF - 36 General Health	59,39 ± 17,8	-0.440	<0.001*	-0.239	0.002*

p<0.05 statistical significance. r: Correlation Coefficient PSS: Perceived Stress Scale. MSS: Menstruation Symptom Scale. SS: Standard Deviation. Pearson's and Spearman's Correlation Analysis.

Figure 1. Flowchart

Discussion

As a result of this study, a significant relationship was found between perceived stress level and menstrual symptoms. The increase in stress level also causes an increase in menstrual symptoms. In addition, according to our study, both the stress level and the increase in menstrual symptoms affect the quality of life negatively.

Dysmenorrhea is one of the leading menstrual symptoms and its prevalence is between 45-95% among women of reproductive age in the world. The strongest risk factors associated with dysmenorrhea are heavy menstrual bleeding and family history [16]. Bauman et al. express that women soldiers with heavy menstrual bleeding and dysmenorrhea have limitations in daily living activities and have reduced quality of life. It has been recommended that every woman should be at the most appropriate level both physiologically and psychologically to commence their career and therefore it is essential to increase awareness of menstrual symptoms and provide effective treatment [17]. On the other hand, studies show that menstrual symptoms of military women are more severe than those of university students [7,18,19]. In our study, it was revealed that perceived high stress increased the severity of menstrual symptoms. We speculated that the stress levels of military

women may be higher due to the working conditions. Also, our study revealed that higher stress levels caused worse menstrual symptoms.

There is a reported positive bidirectional relationship between dysmenorrhea and bad mood. Anger at the beginning of menstruation increases the incidence of dysmenorrhea [20]. Demir et al. revealed that the anxiety and stress level, which was quite high during the COVID-19 pandemic, affected the menstrual cycle characteristics of the woman [21]. In line with these studies, we also found that menstrual symptoms get worse according to bad mood such as anxiety, depression, and anger, the results of our study match the results we found in the literature. On the other hand, there is a limited number of studies investigating the relationship between perceived stress levels and menstrual symptoms in the literature.

Menstrual symptoms adversely affect the quality of life and health status of women. Menstrual symptoms lead to some problems such as depressive mode, lethargy, and lack of concentration, which causes social and economic losses. A study investigating the relationship between menstrual symptoms and the quality of life of 6048 working women in Japan reported that increased menstrual symptoms caused a reduced quality of life. They suggested to take this situation into account when regulating work and health policies [22].

A study in which 184 adolescents were volunteered, revealed that 39% of the participants had dysmenorrhea and 8% of these adolescents had amenorrhea due to the limitation of their physical functioning, which led to a decrease in the psychosocial quality of life [23]. Another study reported that 77% of the participants had dysmenorrhea, 10% had oligomenorrhea, and 5% had heavy menstrual bleeding. Women who had menstrual symptoms presented a poor quality of life, besides, women with oligomenorrhea had a worse quality of life than other women [24]. Similarly, our study shows that a high stress level also increases the severity of menstrual symptoms and negatively affects the quality of life.

There is arguable evidence regarding the effect of smoking on dysmenorrhea. While some studies in the Turkish population reported that smoking is not associated with dysmenorrhea, some studies claim that it increases dysmenorrhea [25,26]. Although it is thought that smoking is not a variable that affects dysmenorrhea alone as a result of the studies, the results of our study showed that smoking increases menstrual symptoms.

The small number of participants is a limitation of our study. In the future, it will be important to strengthen our results by increasing the number of participants, providing general data for women in our country, and shedding light on the development of policies that will reduce the negative effects of menstrual symptoms on women's work and social lives.

Limitations

Our study has a limitation. The use of drugs in general or during menstruation was not questioned and it was not taken into account whether these drugs changed menstruation symptoms.

Conclusion

Our study concluded that excessive perceived stress levels lead to an increment in menstrual symptoms and reduced quality of life among women. In addition, menstrual symptoms negatively affect women's quality of life. According to the results of our study, it is recommended that future studies investigate the effects of stress reduction practices on women's menstrual symptoms and quality of life.

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This study was approved by the Non-Interventional Scientific Research Ethics Committee Istanbul Atlas University (Date: 2022-03-30, No: E-22686390-050.01.04-13570)