



The Comparison of the Premenstrual Syndrome Patients with and without COVID-19 History

COVID-19 Pandemi Sürecinin Kadınlardaki Premenstruel Sendrom Üzerine Etkisi

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ABSTRACT

Aim: The term premenstrual syndrome (PMS) is used to define somatic, cognitive, emotional, and behavioural disorders that emerge during the luteal phase of the menstrual cycle and rapidly recover with the onset of menstruation. The aim of this study was to investigate PMS symptoms in women who were sensitive psychosocially because of pandemic restrictions.

Material and Methods: The study included a total of 187 women aged 18-50 years who presented at the Gynaecology and Obstetrics Department of Turhal State Hospital between June 2021 and August 2021. The women were separated into two groups as 66 who had contracted and recovered from COVID-19 infection within the previous 6 months and 121 who had not had COVID-19 infection. The PMS Scale was applied to all the patients.

Results: The rates of complaints of changes in appetite ($p=0.004$), depressive mood ($p=0.002$), depressive thoughts ($p=0.001$), fatigue ($p=0.001$), changes in sleep ($p=0.002$), anxiety ($p=0.036$) and menstrual irregularity ($p=0.003$) were determined to be statistically significantly higher in the COVID-19 group compared to the group that had not had COVID-19.

Conclusion: The PMS complaints of changes in appetite, depressive mood, depressive thoughts, fatigue, changes in sleep, anxiety and menstrual irregularity were experienced more in the women who had had COVID-19. Therefore, the PMS complaints of women during the COVID-19 pandemic should be listened to carefully and it must be taken into consideration that these can be more significant in patients who have contracted COVID-19 infection.

Keywords: COVID-19, Premenstrual syndrome, Depressive mood- thoughts, Changes in sleep, Fatigue

ÖZ

Amaç: Menstrüel siklusun luteal faz sırasında ortaya çıkıp, menstruasyonun başlamasıyla hızla düzelen somatik, bilişsel, duygusal ve davranışsal bozuklukları tanımlamak için premenstruel sendrom (PMS) tanımı kullanılmaktadır. COVID-19 pandemisi ise tıbbi, psikolojik ve sosyal-ekonomik yönleriyle küresel halk sağlığı sorununa neden olan bir kriz durumudur. Bu çalışmada pandemi döneminde kısıtlamalara bağlı olarak psikososyal yönden hassas olan kadınların PMS semptomlarının araştırılması amaçlanmıştır.

Gereç ve Yöntemler: Haziran 2021 ile Ağustos 2021 tarihleri arasında Turhal Devlet Hastanesi Kadın Hastalıkları ve Doğum Polikliniği'ne; 18-50 yaş aralığında olan 187 kadın çalışmaya dahil edildi. Kadınlar son 6 ay içerisinde COVID-19 hastalığı geçiren ve iyileşen 66 kadın ile COVID-19 hastalığı geçirmeyen 121 kadın olmak üzere iki ayrı gruba ayrıldı. Gruplar; yaş, gravida, parite, medeni hal, vücut kütlesi



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endeksi (VKİ), sigara kullanımı, hirsutizm varlığı, oral kontraseptif (oks) kullanımı, emzirme durumu, rahim içi araç (ria) kullanımı, menstrüel düzen ve dismenore varlığı açısından PMS Ölçeği (PMSÖ) kullanılarak karşılaştırıldı.

Bulgular: COVID-19 pandemisi ile birlikte iştah değişikliği ($p=0.004$), depresif duygulanım ($p=0.002$), depresif düşünceler ($p=0.001$), yorgunluk ($p=0.001$), anksiyete ($p=0.036$) ve uyku değişiklikleri ($p=0.002$) şikayetlerinin COVID-19 hastalığı geçiren grupta, COVID-19 hastalığı geçirmeyen gruba göre belirgin olarak daha yüksek oranda saptandı. Ayrıca menstrüel düzen hali COVID-19 geçirmeyen kadınlarda COVID-19 geçiren kadınlara göre daha yüksek oranda görüldü ($p=0.003$).

Sonuç: PMS şikayetleri arasında yer alan iştah değişikliği, depresif duygulanım, depresif düşünceler, yorgunluk, uyku değişiklikleri ve menstrüel düzensizlik şikayetlerinin COVID-19 geçirenlerde daha yoğun yaşanmaktadır. Bu nedenle COVID-19 pandemisinde kadınların PMS şikayetleri dikkatle dinlenmeli ve bunların geçirilmiş COVID-19 hastalığı ile daha belirgin olabileceği göz önünde bulundurulmalıdır.

Anahtar Sözcükler: COVID-19, Premenstrüel sendrom, Depresif duygulanım-düşünceler, İştah-uyku değişikliği, Yorgunluk

INTRODUCTION

Premenstrual syndrome (PMS) is defined as physical, emotional, and behavioural symptoms which are seen in the luteal phase of the menstrual cycle, recur in most cycles, are rapidly resolved with the onset of menstruation, and are not seen for at least one week in the follicular phase. PMS can cause significant behavioural changes to a degree that disrupts social relationships and daily activities (1).

Previous epidemiological studies have reported that approximately one-fifth of women experience PMS (2). Therefore, as PMS is frequently seen in adolescence, it is striking as one of the important problems of this period (3).

Genetic factors, stress, psychological status, hormonal imbalances, the culture in which an individual lives, and information and attitude to menstruation, are thought to have an effect on PMS (4). Dysmenorrhea is treated as one of the factors affecting PMS. PMS symptoms start following menarche, increase together with age, and reduce as menopause approaches (5). PMS can manifest with up to 150 different symptoms (6). The most frequently seen symptoms include melancholy, tension, inability to control anger, acne, fatigue, listlessness, headache, dizziness, oedema, increased appetite, weight gain, anxiety, irritability, crying for no reason, thoughts of worthlessness, decreased concentration, a feeling of fullness and sensitivity in the breasts, muscle and joint pain, avoidance of social relationships, reduced sexual activity, and a tendency to be argumentative. It has been reported that there could be a relationship between personal characteristics and complaints in the premenstrual period (7). Knowledge of the relationship between PMS and personal structures can be of benefit in coping with premenstrual symptoms and treating these symptoms.

Treatment approaches to PMS depend on the severity of symptoms; for mild and moderate level symptoms, lifestyle and dietary changes are generally recommended, whereas medical treatment may be necessary for severe symptoms (8). These conditions are not life-threatening but can severely diminish the quality of life for many women, and

can affect mental health and productivity. Determination of the range and severity of premenstrual symptoms is important in providing relief with interventions to prevent the symptoms. Regular physical activity is one of the effective methods to ameliorate and eliminate premenstrual symptoms, and it has been emphasised that this improves quality of life by strengthening psychological well-being and physical functionality (9).

The COVID-19 pandemic has created a different adaptation process with which people are not familiar such as distancing from social environments and changes in daily routine activities. Social isolation is known to cause psychosocial problems (10). Children, adolescents, women, and the elderly are thought to have been most affected by the pandemic. The aim of this study was to investigate PMS symptoms in women who had experienced COVID-19 infection and recovered within the previous 6 months.

MATERIAL and METHODS

The study included a total of 187 women with menstrual cycles, aged 18-50 years, who presented at the Gynaecology and Obstetrics Polyclinic of Turhal State Hospital because of PMS between June 2021 and August 2021. Ölçer Z et al. a power analysis was conducted by taking into account the article "Effect of University Students' Personality on Premenstrual Complaints" (11). Accordingly, the percentage of dysmenorrhea in those with a PMS scale of 110 and below was 41.9%, and the percentage of dysmenorrhea in those with a PMS scale of 111 and above was 58.1%. As a result of the power analysis we made with reference to this article, we determined 5% Margin of Error, 80% Power and Standard Effect Size as 0.32 and we found that $n=150$ cases were sufficient for the study. In this direction, it is aimed to reach at least 150 patients in total.

All procedures in this research were applied in compliance with the principles of the Helsinki Declaration 2008. Patients were excluded from the study if they were aged <18 years or >50 years, were amenorrhic, had active COVID-19 infection, or had had COVID-19 more than 6 months previously. The women were separated into two groups

as 66 who had contracted and recovered from COVID-19 infection within the previous 6 months and 121 with no history of COVID-19 infection. Patients were not questioned about their vaccination status.

Approval for this descriptive, cross-sectional study was granted by the Local Ethics Committee of Gaziosmanpaşa University (decision no: 21-KAEK-138). Written informed consent from was obtained from the patients.

The groups were compared in respect of age, gravida, parity, marital status, body mass index (BMI), smoking, hirsutism, the use of oral contraceptives, breastfeeding status, the use of intrauterine device (IUD), menstrual regularity, and dysmenorrhea. The PMS Scale (PMSS) was applied to evaluate depressive mood, anxiety, fatigue, irritability, depressive thoughts, pain, changes in appetite, changes in sleep, and oedema (12).

The PMSS was developed in 2006 by Gençdoğan according to the DSM III and DSM IV-R to measure the severity of premenstrual symptoms (12). This scale, which is widely used in Turkey, consists of 44 items marked by the subject according to the "status one week before menstruation". The items on the PMSS are scored on a 5-point Likert-type scale in 9 subdimensions of depressive mood, anxiety, fatigue, irritability, depressive thoughts, pain, changes in appetite, changes in sleep, and oedema. The subdimension points are calculated and the PMSS total points are the total of the subdimension points, ranging from 44 to 220, with higher points indicating more severe premenstrual symptoms. The responses of the study subjects were recorded.

Statistical Analysis

Data obtained in the study were analyzed statistically using SPSS vn. 16.0 software (Statistical Package for Social Sciences Chicago, IL, USA). Descriptive statistics were stated as mean \pm standard deviation (SD) values for continuous variables, median, minimum, maximum, number (n) and percentage (%) for categorical variables. The conformity of the quantitative data to normal distribution was assessed with the Kolmogorov-Smirnov test. In the paired group comparisons, the Independent Samples t-test, the Mann Whitney U-test, or the Chi-square test was applied. A value of $p < 0.05$ was accepted as statistically significant.

RESULTS

Evaluation was made of a total of 187 women in two groups; 66 women who had contracted COVID-19 within the last 6 months and recovered, and 121 women who had not had COVID-19. The mean age of the patients was 36.85 ± 7.35 years in the COVID-19 group and 36.52 ± 8.67 years in the non-COVID group ($p = 0.795$). No statistically significant difference was determined between the groups in respect

of gravida ($p = 0.052$), parity ($p = 0.209$), and BMI ($p = 0.164$) (Table 1).

The menstrual regularity of the women who had not had COVID-19 was seen at a higher rate than in the COVID-19 group ($p = 0.003$). No statistically significant difference was determined between the groups in respect of marital status ($p = 0.081$), smoking ($p = 0.718$), hirsutism ($p = 0.067$), use of oral contraceptives ($p = 0.053$), breastfeeding status ($p = 0.374$), the presence of an IUD ($p = 0.077$), and dysmenorrhea ($p = 0.373$) (Table 1).

When the severity or degree of the PMS complaints according to the PMSS were compared between the women who had experienced COVID-19 and those with no history of COVID-19 infection, the rates of complaints of changes in appetite ($p = 0.004$), depressive mood ($p = 0.002$), depressive thoughts ($p = 0.001$), fatigue ($p = 0.001$), anxiety ($p = 0.036$), and changes in sleep ($p = 0.002$) were determined to be statistically significantly higher in the COVID-19 group. No statistically significant difference was observed between the groups in respect of anxiety ($p = 0.036$), irritability ($p = 0.506$), pain ($p = 0.253$), and oedema ($p = 0.057$) (Table 2).

DISCUSSION

Very little is known about the association between PMS and COVID-19. In this study, patients who presented at a single centre polyclinic in a period of approximately three months were evaluated according to the PMSS. The study results demonstrated that the complaints of change in appetite, depressive mood, depressive thoughts, fatigue, changes in sleep, and menstrual irregularity were determined at a significantly higher rate in the patients who had experienced COVID-19 infection compared to those with no history of COVID-19.

In a study of 200 university students in Nigeria, it was reported that 85.5% experienced PMS, and the most frequent symptoms were found to be lower abdominal pain, oedema/spots on the face, sensitivity/heaviness in the breasts, depression/tension, and fatigue (13). Although there are differences in the ranking of symptoms in previous studies, it can be seen that the health of young girls and women is negatively affected by PMS (14). A study was conducted in the USA between 15 April and 25 June 2020 of patients with a positive RT-PCR test for SARS-CoV-2 infection who were treated as outpatients, and the most commonly reported symptoms were fatigue (71%), cough (61%), and headache (61%) (15). The most common prolonged COVID-19 symptoms have been reported to be fatigue, loss of taste and smell, and joint pains (16, 17). In the current study, fatigue was determined at a higher rate in the patients who had experienced COVID-19, but the complaint of headache was not at a higher rate in this group.

Table 1: Comparisons of the demographic and clinical data of the women who had contracted and recovered from COVID-19 infection and those with no history of COVID-19, including marital status, smoking status, hirsutism, use of oral contraceptives, breastfeeding status, presence of IUD, menstrual irregularity and dysmenorrhea.

	No history of COVID-19 infection	Contraction of and recovery from COVID-19 infection	p value
Age (years)*	36.52±8.67	36.85±7.35	p=0.795 α
Gravida (n) (med(min-max))	1 (0-6)	2 (0-5)	p=0.052 α
Parity (n) (med(min-max))	1 (0-3)	2 (0-3)	p=0.209 α
BMI (kg/m ²) (average(±SD))	26.27±5.24	27.52±6.79	p=0.164 β
Marital status, n (%)	Single	36 (19.3)	p=0.081 γ
	Married	81 (43.3)	
	Widowed	4 (2.1)	
Smoking status, n (%)	Non-smoker	98 (52.4)	p=0.718 γ
	Smoker	52 (27.9)	
Hirsutism, n (%)	Absent	104 (55.6)	p=0.067 γ
	Present	49 (26.2)	
Oral contraceptive use, n (%)	Absent	114 (61)	p=0.053 γ
	Present	56 (29.9)	
Breastfeeding status, n (%)	Absent	117 (62.6)	p=0.374 γ
	Present	62 (33.1)	
IUD, n (%)	Absent	107 (57.2)	p=0.077 γ
	Present	52 (27.8)	
Menstrual regularity, n (%)	Absent	36 (19.3)	p=0.003** γ
	Present	34 (18.2)	
Dysmenorrhea, n (%)	Absent	95 (50.8)	p=0.373 γ
	Present	48 (25.7)	

*Mean±SD, α : Independent Samples t-test, β : Mann Whitney U-test, γ : Chi-square test, **: A value of p<0.05 was accepted as statistically significant.

Some personality traits could be the reason for strong responses to complaints associated with PMS (18). In a study by Gaion and Vieira, women with PMS were found to have an introverted personality structure and those who did not have PMS had a more dominant character and the personality trait of persistence (18). Sassoon et al reported that personality disorders were seen more in women with PMS, and anxiety disorder was common in these women (19). While changes in diet and weight during the pandemic can affect menstrual symptoms, hormonal fluctuations related to the menstrual cycle can affect appetite control and eating behaviour (20). In the current study, the degree of the complaint of anxiety and change in appetite together with the COVID-19 pandemic was seen at a significantly higher rate in the group that had had COVID-19 infection compared to the non-COVID-19 group.

In a study by Wong and Khoo, it was reported that 83.6% of the study participants showed one or more somatic and emotional symptoms in the premenstrual period, and irritability, tension and emotional fluctuations were the

three most common symptoms. There were also seen to be PMS effects of low academic concentration, a decrease in performance, and restricting social activities (21). In recent studies of the psychological and social effects of COVID-19, it has been shown that this disease has led to many radical changes in societal living conditions and these are associated with negative psychological outcomes (22,23). For example, in a study of 1210 subjects in China during the COVID-19 pandemic, 16.5% of the subjects were found to have moderate and severe depression symptoms and 28.8% had moderate and severe anxiety symptoms (24). In the current study, the degree of the complaints of depressive mood and depressive thoughts together with the COVID-19 pandemic was seen at a significantly higher rate in the group that had experienced COVID-19 infection compared to the non-COVID-19 group.

The prevalence of insomnia in females varies between 14% and 53% (25). In a web-based study during the COVID-19 pandemic, the prevalence of mental health diseases such as anxiety and depression was seen to increase. The

Table 2: Comparisons of the degree of PMS symptoms of the women who had contracted and recovered from COVID-19 infection and those with no history of COVID-19.

PMS symptoms	Degree	No history of COVID-19 infection	Contraction of and recovery from COVID-19 infection	p value
Depressive mood, n (%)	None or minimal	51 (27.3)	18 (9.6)	p=0.002* γ
	Moderate	36 (19.3)	24 (12.8)	
	Severe	30 (16)	12 (6.4)	
	Very severe	4 (2.1)	12 (6.4)	
Anxiety, n (%)	None or minimal	81 (43.3)	34 (18.2)	p=0.036* γ
	Moderate	24 (12.8)	24 (12.8)	
	Severe	12 (6.4)	8 (4.3)	
	Very severe	4 (2.1)	0	
Fatigue, n (%)	None or minimal	65 (34.8)	24 (12.8)	p=0.001* γ
	Moderate	28 (15)	11 (5.9)	
	Severe	24 (12.8)	18 (9.6)	
	Very severe	4 (2.1)	13 (7)	
Irritability, n (%)	None or minimal	35 (18.7)	18 (9.6)	p=0.506γ
	Moderate	32 (17.1)	24 (12.8)	
	Severe	30 (16)	12 (6.4)	
	Very severe	24 (12.8)	12 (6.4)	
Depressive thoughts, n (%)	None or minimal	72 (38.5)	32 (17.1)	p=0.001* γ
	Moderate	21 (11.2)	15 (8)	
	Severe	24 (12.8)	6 (3.2)	
	Very severe	4 (2.1)	13 (7)	
Pain, n (%)	None or minimal	62 (33.2)	24 (12.8)	p=0.253γ
	Moderate	35 (18.7)	24 (12.8)	
	Severe	20 (10.7)	14 (7.5)	
	Very severe	4 (2.1)	4 (2.1)	
Changes in appetite, n (%)	None or minimal	51 (27.3)	44 (23.5)	p=0.004* γ
	Moderate	22 (11.8)	4 (2.1)	
	Severe	34 (18.2)	16 (8.6)	
	Very severe	14 (7.5)	2 (1.1)	
Changes in sleep, n (%)	None or minimal	57 (30.5)	18 (9.6)	p=0.002* γ
	Moderate	19 (10.2)	6 (3.2)	
	Severe	28 (15)	19 (10.2)	
	Very severe	17 (9.1)	23 (12.3)	
Oedema, n (%)	None or minimal	37 (19.3)	24 (19.3)	p=0.057 γ
	Moderate	12 (6.4)	14 (7.5)	
	Severe	44 (23.5)	20 (10.7)	
	Very severe	28 (15)	8 (4.3)	

γ: Chi-square test. *: A value of p<0.05 was accepted as statistically significant.

prevalence of depression was reported to be 18.5%, anxiety 24.6%, and poor sleep quality 69.5% (26). In the current study, a greater rate of the complaint of change in sleep was observed in the women who had had COVID-19, but

the complaint of anxiety was not determined at a higher rate in this group.

Hormonal changes in the premenstrual period lead to a series of mental changes in the central nervous system, and

it is thought that these could cause menstrual irregularity in addition to affecting mood and behaviours (27). It has been considered that COVID-19 infection could cause menstrual irregularities. In the current study, complaints of menstrual irregularity were determined at a higher rate in the COVID-19 group.

A limitation of this study was the relatively low number of patients in each group, which may have been the reason for not reaching statistically significant results in some parameters. Therefore, there is a need for further studies with greater numbers of patients.

The PMS complaints of changes in appetite, depressive mood, depressive thoughts, fatigue, changes in sleep, and menstrual irregularity were experienced more intensely in the women who had had COVID-19. Therefore, the PMS complaints of women during the COVID-19 pandemic should be listened to carefully and it must be taken into consideration that these can be more significant in patients who have contracted COVID-19 infection.

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Author Contributions

All contributions of each authors are equal.

Conflicts of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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Ethical Approval

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Review Process

Extremely peer-reviewed and accepted

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