ORIGINAL RESEARCH

DOI: 10.5336/jcog.2024-106101

A Study on Premenstrual Syndrome and Obsessive-Compulsive Symptoms Among University Students: A Cross-Sectional Study

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ABSTRACT Objective: The present study aimed to investigate the potential correlation between Premenstrual syndrome (PMS) and obsessive-compulsive symptoms (OCS) among university students. **Material and Methods:** A cross-sectional study was conducted with female students from Çanakkale Onsekiz Mart University, excluding those with neuropsychiatric or chronic physical illnesses. The data included sociodemographics (age, height, weight, economic status, menstrual cycle characteristics) and health behaviors (smoking, alcohol consumption). Premenstrual symptoms were evaluated with the PMS Scale (PMSS) and OCS with the Maudsley Obsessional-Compulsive Inventory (MOCI-T). Participants were grouped based on PMSS scores indicating PMS presence, and correlation and regression analyses explored the relationship between PMS and OCS. **Results:** A total of 552 females aged 18-24 (mean age: 20.22±1.56) participated, with 74.2% (n=410) reporting PMS. PMS individuals had markedly higher total MOCI-T scores than non-PMS individuals ($p \leq 0.001$). PMSS dimensions (except for abdominal bloating and appetite changes) showed associations with MOCI-T, with rumination exhibiting the strongest positive correlations ($p \leq 0.001$). MOCI-T scores also correlated significantly with anxiety and depressive thoughts, with anxiety having a slightly stronger impact ($B=0.315$, $\beta=0.318$, $p \leq 0.001$ vs $B=0.174$, $\beta=0.194$, $p \leq 0.001$). **Conclusion:** The results indicate a significant link between PMS and OCS, emphasizing the intertwining of menstrual health and mental well-being in young females. Moreover, the correlations between PMS dimensions, OCS, and psychological factors like anxiety and depressive thoughts suggest a multifaceted relationship deserving a further study.

Keywords: Menstrual cycle; premenstrual syndrome; obsession; compulsion

Premenstrual syndrome (PMS) presents a range of physical, emotional, and behavioral symptoms during the luteal phase of the menstrual cycle, affecting around 80% of women but reaching clinical significance in approximately 5% of cases.[1] The etiology of PMS is multifaceted, involving a combination of factors such as hormonal fluctuations, neurotransmitter dysregulation, genetic predisposition, psychological stress, mood disorders, lifestyle choices (including diet and exercise), and potential environmental influences. Nonetheless, hormonal changes throughout the menstrual cycle are deemed central to the manifestation of PMS. Fluctuations in estrogen and progesterone levels are believed to influence the severity and onset of PMS symptoms significantly. The interplay between ovarian steroid fluctuations and mood involves alterations in serotonergic neurotransmission.[2] Serotonin (5HT) dysregulation is another commonly investigated etiopathogenic hypothesis in PMS, given its relevance to irritability, anger expression, depressive symptoms, and specific food cravings, making it an essential aspect to consider.[3,4]

TO CITE THIS ARTICLE:
Kaymaz N, Ertekin H, Kasap T, Şirin H. A study on Premenstrual syndrome and obsessive-compulsive symptoms among university students: A cross-sectional study. JCOG. 2025;35(1):1-9.

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Peer review under responsibility of Journal of Clinical Obstetrics & Gynecology.

Received: 08 Oct 2024 ***Accepted:*** 04 Feb 2025 ***Available online:*** 21 Feb 2025

Considering all the available evidence, the premenstrual phase emerges as a vulnerable period for exacerbations of associated psychiatric disorders, such as depression, anxiety disorders, and an increased risk of suicide attempts.[5-7] Studies have shown that in a subset of women, obsessive-compulsive symptoms (OCS) have their onset in or exacerbate during various reproductive cycle events, such as pregnancy and postpartum.[8]

Obsessive compulsive disorder (OCD) is a neuropsychiatric disorder characterized by intrusive, unwanted, and recurrent thoughts (obsessions) and/or repetitive ritualistic behaviors (compulsions). The lifetime prevalence rate of OCD is estimated to be 1-3% and is consistent across different countries.[9] Impaired neurotransmitter systems, primarily involving serotonin (5HT), have been implicated in the complex pathophysiology of OCD, with changes in 5HT levels or receptor function associated with the disorder's development and maintenance. Research indicates that the onset or exacerbation of OCD in women may be linked to reproductive cycle events, with an increase in obsessive thoughts or compulsive behaviors observed during the premenstrual period, which is possibly associated with fluctuations in serotonin levels and sex hormones.[8] Furthermore, certain antidepressant medications effective in treating OCD have demonstrated efficacy in alleviating PMS symptoms.[10]

The complex interaction between neurotransmitters and their modulation by hormonal fluctuations underscores their potential role in both PMS and OCD. Studies investigating the relationship between women's reproductive events and OCD have primarily focused on its relationship with pregnancy, the postpartum period, and the perimenopausal period. This study addresses this gap by examining the relationship between PMS and OCS in the context of female college students.

MATERIAL AND METHODS

ETHICAL CONSIDERATIONS

The study has been approved by the ethics committee of Çanakkale Onsekiz Mart University and conducted in accordance with the Declaration of Helsinki. Ethics approval date: KAEK October 18, 2023, no:2023/13-11.

SAMPLE SIZE AND SAMPLING

A cross-sectional study involved female students in various faculties of Çanakkale Onsekiz Mart University between October 2023 and January 2024. Class representatives from each faculty assisted in contacting the students. Prior to participation, an informed consent form was administered, and participants were briefed on the study's objectives and procedures. Students from each of the 4 professional years (first, second, third, and final) were assigned through random sampling.

Participants met the following inclusion criteria: not having any known neuropsychiatric (e.g., schizophrenia, depression, bipolar disorder, panic disorder, epilepsy) or chronic physical illnesses (e.g., polycystic ovary syndrome, diabetes, hypertension, metabolic syndrome, asthma), as they are likely to distort the premenstrual symptoms and may introduce bias in the results.

To detect an effect size of Cohen's d=0.5 with 80% power (alpha=0.05, two-tailed) and an allocation ratio of N2/N1=11.5, we need 34 participants in the group with N1 and 396 participants in the group with N2 for a total sample size of 430 in an independent samples t-test.

Seven hundred fifty students were initially contacted for participation in the study. Among them, 152 declined to take part, and an additional 46 were disqualified due to documented medical or psychiatric conditions. Consequently, the total number of participants eligible for analysis was 552. The final response rate, based on these eligible participants, was determined to be 73.6%. Notably, there were no missing data among the surveys provided by the remaining participants.

MEASUREMENTS

The Sociodemographic Information

The sociodemographic information was collected after obtaining consent. Participants completed a personal information form, providing details such as date of birth, birth type, economic status (good, moderate, bad), age at menarche, and menstrual cycle characteristics, including average menstrual cycle length and average number of days of men-

strual bleeding/flow. Additionally, height, weight, and health behaviors such as current smoking status (number of cigarettes per day) and alcohol consumption (frequency per month) were also queried. Only social drinkers with no history of alcohol dependence or drug abuse were selected for the study.

Premenstrual Syndrome Scale (PMSS): Developed by Gençdoğan in 2006, this scale measures the severity of premenstrual symptoms based on DSM III and DSM IV-R criteria.[11] This scale assesses PMS prevalence in various populations, providing insights into the intensity of symptoms experienced. It includes 44 items across nine sub-dimensions: depressive mood, anxiety, fatigue, irritability, depressive thoughts, pain, appetite changes, sleep changes, and bloating. The participants were asked to mark the symptoms only if they had experienced it for one week before the onset of the menstrual cycle for at least two menstrual cycles. Each item is rated on a 5-point Likert scale, ranging from "never" to "very frequently". The total score, ranging from 44 to 220, indicates the severity of symptoms, with higher scores suggesting more severe premenstrual symptoms. The Cronbach's alpha reliability coefficient is calculated as α=0.95.

Maudsley Obsessional-Compulsive Inventory (MOCI-T): MOCI is a self-report scale that is used to investigate the types and prevalence of OCS in OCD patients and healthy individuals. Originally developed by Hodgson and Rachman and adapted into Turkish by Erol and Savaşır, this questionnaire consists of 37 true/false items categorized into checking, cleaning/washing, slowness, doubt, and rumination sub-scales.[12,13] The 7-item rumination subscale of the Minnesota Multiphasic Personality Inventory (MMPI) was added to the Turkish adaptation of MOCI. The total score ranges from 0 to 37, with higher scores indicating more severe OCS. "True" marks are scored as "1" points, and "false" marks are scored as "0". The total score has been obtained from the sum of all items. The Turkish version's reliability coefficient is α=0.86 for the overall scale and 0.61-0.65 for subscales, demonstrating good test-retest reliability (α=0.88).

Outcome Measures

Participants were grouped based on the measures of the outcome of the PMSS total score. A score exceeding 50% of the highest possible score suggests the presence of PMS. The participants were thus classified as a PMS group and a non-PMS group.

DATA ANALYSIS

The Jamovi project version 2.3 (JASP, Sydney, Australia) was used for data analysis (retrieved from https://www.jamovi.org). Normality analyses were performed using the Kolmogorov-Smirnov goodness-of-fit test in the between-group analysis of continuous variables. For the comparison of the demographic and clinical data, the independent samples Student's t-test was used for quantitative variables; the chi-square test and Fisher's exact test were used for categorical variables. The Mann-Whitney U test was used for between-group data comparisons that did not follow a normal distribution. Associations between various parameters were investigated using the Pearson's correlation analysis. The multiple linear regression and binary logistic regression entry method analysis were used to assess the significant findings of predictive factors. While performing regression analysis, VIF and tolerance values were examined to evaluate whether there was a multicollinearity problem. In addition, Cook's distance, Mahalanobis, value and Leverage values were examined to control extreme values. The level of statistical significance was considered to be $p<0.05$.

RESULTS

DEMOGRAPHIC AND CLINICAL CHARACTERISTICS

Five hundred fifty-two female university students with a mean age of 20.22±1.56 years (range: 18 to 24 years) participated in the study. Of these, 74.2% (n=410) were identified as experiencing PMS.

The mean age in the PMS and non-PMS groups exhibited negligible variance at 20.23±1.55 and 20.18±1.60, respectively (p=0.762). However, a discernible link emerged between economic status and PMS (p=0.008), denoting a heightened prevalence of PMS in cohorts with favorable economic status. The

TABLE 1: Sociodemographic characteristics of the participants.

	PMS group (n=410)	non-PMS group (n=195)		
	X̄±SD		Statistics	p value
Age	20.23±1.55	20.18±1.60	$t_{student}$=0.303	0.762
BMI	20.59±3.50	21.63±3.31		0.909
Health behaviours				
Smoking status				
Yes	103 (25.1)	24 (16.9)	**	**0.049**
No	307 (74.9)	118 (83.1)		
Cigarette/per day*	8.37±5.66	8.87±7.14	$t_{student}$=-0.376	0.708
Alchohol consumption				
Yes	138 (33.7)	30 (21.1)	**	**0.008**
No	270 (65.9)	112 (78.9)		
Alchohol intake per month	2.80±2.04	2.53±1.69	$t_{student}$=0.675	0.501
Menstrual history				
Age at menarche (year)	12.92±1.19	12.90±1.20	$t_{student}$=0.137	0.891
Menstrual cycle length (day)	30.09±8.79	30.19±6.84	$t_{student}$=-0.157	0.824
Menstrual period duration (day)	5.83±1.29	5.85±1.44	$t_{student}$=-0.222	0.876
Perceived family income				
Good	56 (13.7)	28 (19.7)	χ^2=6.827	**0.008**
Moderate	342 (83.4)	114 (80.3)		
Bad	12 (2.9)	0 (0)		

*=X̄±SD: mean±standard deviation; **Fisher's exact test, statistical significance value=p<0.05; PMS: Premenstruel syndrome; BMI: Body mass index.

comparison of demographic data between the two groups is given in Table 1.

In cases of PMS, no statistical difference was found between PMSS total scores among alcohol consumers and non-consumers (151.34±25.83 vs 147.47±23.12, respectively, p=0.126), as well as between smokers and non-smokers (152.14±25.59 vs 147.63±23.53, respectively, p=0.101).

In PMS cases, a statistically significant difference was found between PMSS total scores and reported economic status (good, moderate, bad; 146.01±26.12, 148.42±23.35, 171.33±24.11 respectively, p=0.003).

MOCI-T SCORES

Individuals with PMS exhibited significantly higher total MOCI-T scores than those without PMS (17.68 vs. 12.29, p≤0.001), indicating more severe OCS. Across specific behaviors measured by the MOCI-T, individuals with PMS show significantly higher scores in checking, cleaning, doubting, slowness, and rumination compared to the non-PMS group (all p≤0.002) (Table 2).

TABLE 2: MOCI-T scores comparison between PMS and Non-PMS groups.

	PMS group*	non-PMS group*	p value
Total score	17.68±6.19	12.29±5.91	**≤0.001**
Subscales' scores			
Checking	4.22±2.14	2.62±1.84	**≤0.001**
Cleaning	4.44±2.14	3.78±2.11	**0.002**
Doubting	3.53±1.62	2.39±1.45	**≤0.001**
Slowness	2.79±1.58	1.74±1.25	**≤0.001**
Rumination	5.43±2.31	3.06±2.30	**≤0.001**

*=X±SD: mean±standard deviation; Statistical significance value=p<0.05; PMS: Premenstrual syndrome; MOCI-T: Turkish version of Maudsley obsessional-compulsive inventory.

THE CORRELATION ANALYSIS

No statistically significant correlations were found between age at menarche, duration of menstrual pe-

TABLE 3: Correlations between MOCI-T subscales and PMSS dimensions.

Variable	Checking*	Cleaning*	Doubting*	Slowness*	Rumination*	Total*
Depressive affect*						
r value	0.296	0.119	0.314	0.334	0.463	0.370
p value	**≤0.001**	**≤0.001**	**≤0.001**	**≤0.001**	**≤0.001**	**≤0.001**
Anxiety*	0.402	0.190	0.390	0.389	0.493	0.449
	≤0.001	**≤0.001**	**≤0.001**	**≤0.001**	**≤0.001**	**≤0.001**
Fatigue*	0.271	0.133	0.264	0.316	0.383	0.333
	≤0.001	**≤0.001**	**≤0.001**	**≤0.001**	**≤0.001**	**≤0.001**
Irritability*	0.259	0.103	0.235	0.304	0.389	0.306
	≤0.001	0.015	**≤0.001**	**≤0.001**	**≤0.001**	**≤0.001**
Depressive thoughts*	0.313	0.160	0.372	0.350	0.502	0.409
	≤0.001	**≤0.001**	**≤0.001**	**≤0.001**	**≤0.001**	**≤0.001**
Pain*	0.198	0.047	0.166	0.182	0.234	0.195
	≤0.001	0.267	**≤0.001**	**≤0.001**	**≤0.001**	**≤0.001**
Appetite changes*	0.060	-0.001	0.027	0.101	0.095	0.051
	0.161	0.974	0.522	0.017	0.026	0.229
Sleep changes*	0.137	0.069	0.137	0.170	0.254	0.178
	≤0.001	0.103	**≤0.001**	**≤0.001**	**≤0.001**	**≤0.001**
Abdominal bloating*	0.088	-0.006	0.059	0.138	0.139	0.077
	0.039	0.883	0.164	**≤0.001**	**≤0.001**	0.070
Total*	0.344	0.146	0.340	0.373	0.494	0.406
	≤0.001	**≤0.001**	**≤0.001**	**≤0.001**	**≤0.001**	**≤0.001**

MOCI-T: Turkish version of Maudsley obsessional-compulsive inventory; PMSS: Premenstrual syndrome scale; *Pearson correlation analysis; Statistical significance value=p<0.05.

riod, menstrual cycle length, and MOCI-T total score (respectively; r=-0.005, p=0.910; r=-0.028, p=0.506; r=-0.028, p=0.513).

All sub-dimensions of PMSS, except for abdominal bloating and appetite changes, were found to be associated with the MOCI-T. Rumination demonstrated the strongest positive correlations, ranging from 0.139 to 0.502 (p≤0.001), across all PMSS dimensions (Table 3).

THE REGRESSION ANALYSIS

Depressive affect, anxiety, fatigue, irritability, depressive thoughts, pain and sleep changes factors that were found to be correlated with PMS scale scores were added to the linear regression model in determining the predictors of the MOCI total score. As a result of the analysis, only depressive thoughts and anxiety scores were found to be the predictive factors in the MOCI total score (Table 4).

In determining the predictive factors of PMS status, smoking status, alcohol consumption, perceived family income and delivery type which are statistically significant factors between PMS and non-PMS were added to the binary logistic regression analysis model. It was determined that high alcohol consumption level (95% confidence interval (CI): 1.816 (0.247-0.597)),

TABLE 4: The linear regression analysis of MOCI-T in relation to PMSS.

	Unstandardized coefficients				
	B	Std. error	Standardized coefficients	t value	p value
Anxiety	0.315	0.051	0.318	6.231	**≤0.001**
Depressive thoughts	0.174	0.046	0.194	3.813	**≤0.001**

MOCI-T: Turkish version of maudsley obsessional-compulsive inventory; PMSS: Premenstrual syndrome scale; statistical significance value=p<0.05.

cesarean section (95% CI: 0.632 (0.210-0.460)) and low perceived family income (95% CI: 0.493 (0.706-0.237)) could be predictive factors of PMS status.

DISCUSSION

The results of the current study demonstrated a significant link between PMS and OCS, highlighting the intersection of menstrual health and mental health in young women.

PREVALENCE OF PMS

The prevalence of PMS among the surveyed female students was substantial, with approximately three-quarters (74.2%) of participants reporting experiencing PMS symptoms, which aligns with existing literature highlighting the common occurrence of PMS among young women, particularly in university settings.[14,15] The prevalence of PMS among young women can vary depending on the population studied and the criteria used to define PMS. According to the existing literature, the prevalence of PMS among reproductive-age women ranges widely, from around 50% to 80%.[16]

SOCIODEMOGRAPHIC CHARACTERISTICS FOR PMS RISK

Impact of Economic Status

Interestingly, economic status emerged as a factor associated with PMS. Specifically, individuals from more financially advantaged backgrounds were more likely to experience PMS. However, when the PMS group was evaluated, we found that PMS total scores were significantly higher in those who reported their economic situation as bad or moderate than those with good economic status. These findings suggest a potential socioeconomic dimension to PMS prevalence, warranting further exploration into the underlying mechanisms driving this association.

The association between PMS and economic status is a topic of interest in the literature, with several studies exploring the potential relationship between socioeconomic factors and the prevalence or severity of PMS symptoms. One possible interpretation is that individuals from different economic backgrounds may experience varying levels of stress, access to healthcare, and lifestyle factors, all of which can influence the manifestation of PMS symptoms. For example, higher stress levels associated with lower socioeconomic status may exacerbate hormonal fluctuations and contribute to more severe PMS symptoms. A study by Halbreich et al. found that women with lower socioeconomic status reported higher rates of premenstrual symptoms compared to those with higher socioeconomic status.[17] Moreover, a study by Bertone-Johnson et al. found that women with lower household incomes were more likely to report severe PMS symptoms compared to women with higher household incomes.[14] Economic status may indirectly affect PMS through its impact on stress levels. Women from lower socioeconomic backgrounds may experience higher levels of stress due to financial strain, which could exacerbate PMS symptoms.[18]

On the other hand, some studies have found that women from higher socioeconomic backgrounds may be more likely to experience PMS. For example, a study by Bertone-Johnson et al. observed that women with higher incomes were more likely to report severe premenstrual symptoms.[14]

ALCOHOL AND TOBACCO CONSUMPTION

We found that the alcohol consumption habit of PMS subjects was more frequent than that of non-PMS counterparts. The mean PMSS total score of PMS cases who consumed alcohol was higher than their PMS peers who did not consume alcohol, but no statistically significant difference was detected. The suggestion may be that the severity of PMS complaints may have led to a tendency to consume alcohol. However, we did not assess the severity of PMS in our study.

Previous studies suggest that alcohol consumption is linked to a moderate increase in the risk of PMS. This risk elevation has been found to be particularly notable in heavy drinkers, which supports the notion of a causal relationship between alcohol intake and PMS.[19] This hypothesis is grounded in the idea that alcohol use could potentially heighten the risk of PMS by affecting sex steroid hormones and gonadotropin levels throughout the menstrual cycle. On the other hand, chronic alcohol use involves disruptions in the 5-HT and gamma aminobutyric acid

(GABA) neurotransmitter systems in the brain, which are also implicated in the etiology of PMS. Women experiencing changes in these neurotransmitter systems might exhibit heightened sensitivity to alcohol.[20] Therefore, while alcohol consumption may indeed exacerbate PMS symptoms, the relationship could also be bidirectional, with PMS influencing alcohol consumption patterns.

Similarly, in this study, the rate of smoking was also higher in the PMS group. This was actually an expected result, again in line with the literature. Tobacco use is known to have a disruptive effect on the regulation of sex hormones. This effect or effects may play a role in developing PMS symptoms.[21] Furthermore, a recent review compiling data on physical characteristics such as age, body mass index, and race; menstrual characteristics like age at menarche, number of menstrual days, and menstrual cycle length; and lifestyle factors such as stress, smoking habits, alcohol intake, caffeine consumption, skipping breakfast, physical activity levels, sleep duration, and bedtime revealed a significant association between the prevalence of PMS and smoking.[22] Nicotine, the principal psychoactive component of tobacco, can perturb the delicate equilibrium of neurotransmitter systems, including serotoninergic pathways. Consequently, smoking behavior may induce alterations in serotoninergic neurotransmission, potentially precipitating fluctuations in mood states and behavioral patterns.[23]

OVERLAP WITH OCS

The current study revealed higher total scores on the MOCI-T in individuals with PMS compared to their counterparts without PMS, suggesting that anxiety and depressive thoughts are important factors in explaining the MOCI-T total score, with anxiety exhibiting a slightly stronger association than depressive thoughts. These findings suggest a potential overlap between PMS and OCS, highlighting the need for comprehensive assessment and tailored interventions for individuals experiencing both conditions.

The studies highlight the influence of hormonal fluctuations, particularly estrogen and progesterone, on neurotransmitter systems implicated in mood regulation. The most obvious interaction between ovarian steroids and mood is found in women: premenstrual dysphoric disorder (PMDD), a severe form of PMS characterized by significant mood disturbances and psychological symptoms that are recognized as a psychiatric disorder and are included in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5).[24] Several studies support the notion that women with PMS, particularly those with PMDD, may experience heightened obsessive thoughts and compulsive behaviors during the premenstrual phase.[17] Additionally, they provide empirical evidence for the exacerbation of OCS during the late luteal phase in women, specifically with PMDD. Understanding the interplay between hormonal, neurobiological, and psychological factors is crucial for accurately diagnosing and effectively treating PMS-related symptoms. However, neither PMS nor PMDD includes symptoms related to obsession or compulsion according to the DSM-5 diagnostic criteria. The fact that our study revealed OCS occurring quite frequently alongside mood symptoms of PMS suggests that PMS and PMDD, which are classified among mood disorders, may constitute a distinct syndrome warranting consideration within a broader spectrum.

Studies have shown that the phase before menstruation is a time when psychiatric disorders, such as OCD, can worsen. Similarly, those with OCD are more likely to experience symptoms of PMS compared to the general population.[25] Both conditions appear to exacerbate one another mutually. The serotonergic system, predominantly implicated in OCD pathology, may be influenced by fluctuations in estrogen and progesterone levels during the luteal phase of menstruation. Consequently, serotonin levels or receptor sensitivity may be adversely affected, exacerbating OCD symptoms.[8] Our study reveals an augmentation in OCS even in otherwise healthy participants with PMS. Given the potential interaction between hormone-neurotransmitter systems in the menstrual cycle, inquiring about the relationship between OCS and the menstrual cycle is imperative. According to the results of our study, the vice versa is also valid, and we think it would be helpful to ask about OCS as a comorbid condition in cases with PMS. Additionally, decreased serotonin levels are also associated with depression and anxiety. The pri-

mary finding of elevated scores in depression and anxiety from the MOCI-T subscales in this study fortifies that thesis. Supporting that, among the most prevalent psychiatric comorbidities, anxiety has been identified as strongly associated with premenstrual exacerbation of OCS in OCD patients.[26]

Menstruation can trigger obsessions that focus on OCD symptoms, especially in OCD patients who are obsessed with cleanliness, and can cause extreme worry and anxiety for these people.[8] Hygiene concerns that may be associated with bleeding may increase in OCD patients who are obsessed with cleanliness. In our study, there was a significant positive correlation between PMS scores in cleaning, one of the MOCI-T sub-scores, but this correlation did not rise above the other significant sub-scores. The findings suggest that menstruation could potentially induce more stress compared to contamination obsessions.

Upon examining other menstrual characteristics in the study, we found no correlation between age at menarche, length, and duration of the menstrual period with PMS symptoms and MOCI-T scores. Moreover, the correlation analysis revealed a significant correlation between rumination and the MOCI-T score, particularly from the PMS sub-scales. However, this relationship may not be causal, as highlighted by the regression analysis, where the prominent predictors were the depression and anxiety sub-scales of the MOCI-T. This result suggests that while there may be an association between rumination and PMS symptoms, the underlying factors driving this connection appear to be depression and anxiety. Therefore, rumination may be exacerbated by PMS, but its primary association lies with depression and anxiety.

STRENGTHS AND LIMITATIONS

While the present study benefits from a large sample size of 552 participants and a commendable response rate of 73.6%, it is important to consider certain limitations.

The homogeneity of the sample, consisting mainly of female university students, may restrict the generalizability of findings to broader populations. Participants' cultural and educational backgrounds may also skew the results. Conducting the research only among university students may reflect a higher cultural and educational level and potentially overlook women's experiences from different backgrounds. However, by focusing on a homogeneous group, the study may reduce some confounding variables and allow for a more targeted examination of PMS symptoms and their effects on academic performance and daily functioning among college students.

Additionally, reliance on self-report measures could introduce biases such as recall and social desirability bias, potentially affecting the accuracy of reported data.

The cross-sectional design of the study limits the ability to establish causal relationships between variables, and while robust statistical analyses were employed, there may still be unaccounted confounding variables influencing the results. Therefore, caution should be exercised when generalizing the findings beyond the studied population.

CONCLUSION

This study highlights the significant relationship between PMS and OCS, emphasizing the complex interaction between menstrual health and mental well-being in young females. Strong associations have been identified between PMS symptoms-particularly rumination-and psychological factors such as anxiety and depressive thoughts, indicating a multifaceted connection that merits further exploration. Additionally, the potential influence of socioeconomic and lifestyle factors on PMS prevalence underscores the importance of a holistic approach to understanding and managing PMS-related challenges.

Acknowledgments

We would like to thank all the sample group who participated in our study.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Nazan Kaymaz, Tolga Kasap, Hülya Ertekin;* ***Design:*** *Nazan Kaymaz, Tolga Kasap, Hülya Ertekin, Hande Şirin;* ***Control/Supervision:*** *Nazan Kaymaz, Tolga Kasap;* ***Data Collection and/or Processing:*** *Tolga Kasap, Hande Şirin, Hülya Ertekin;* ***Analysis and/or Interpretation:*** *Nazan Kaymaz, Hülya Ertekin, Tolga Kasap, Hande Şirin;* ***Literature Review:*** *Hande Şirin, Hülya Ertekin, Nazan Kaymaz, Tolga Kasap;* ***Writing the Article:*** *Nazan Kaymaz, Hülya Ertekin, Tolga Kasap, Hande Şirin;* ***Critical Review:*** *Nazan Kaymaz, Hülya Ertekin, Tolga Kasap, Hande Şirin;* ***References and Fundings:*** *Nazan Kaymaz, Tolga Kasap;* ***Materials:*** *Nazan Kaymaz, Hande Şirin, Hülya Ertekin, Tolga Kasap.*

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