Available online at www.medicinescience.org

ORIGINAL ARTICLE

Medicine Science International Medical Journal

Medicine Science 2025;14(3):686-92

Relationship between premenstrual syndrome and compliance with the Mediterranean diet among women of reproductive age

Ozge Yesildemir[1], Neslihan Arslan[2], Eda Nur Dubus[3], Hande Guner[3]

[1]Bursa Uludağ University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Bursa, Türkiye
[2]University of Health Sciences, Gülhane Faculty of Health Sciences, Department of Nutrition and Dietetics, Ankara, Türkiye
[3]Bursa Uludağ University, Graduate School of Health Science, Department of Food Hygiene and Technology, Bursa, Türkiye

Received 11 March 2025; Accepted 24 May 2025
Available online 19 August 2025 with doi: 10.5455/medscience.2025.03.072

Content of this journal is licensed under a Creative Commons Attribution-NonCommercial-NonDerivatives 4.0 International License.

Abstract

Although the Mediterranean Diet (MD) may help prevent and manage Premenstrual Syndrome (PMS), there was little evidence that better MD compliance reduced PMS risk. This study aimed to examine the relationship between PMS and compliance with the MD in reproductive-age women. An online survey of 469 reproductive-age (18-49 years) Turkish women was undertaken between November 2023 and April 2024 for this cross-sectional descriptive study. The survey included demographic information, a Premenstrual Syndrome Scale (PMSS), and a Mediterranean Diet Adherence Screener (MEDAS). The prevalence of PMS was 58.6% of Turkish females. The MEDAS scores of PMS women were not notably different from non-PMS women ($p>0.05$). The adherence to wine consumption (≥7 glasses/week) was notably higher in women with PMS than in those without it ($p<0.05$). A positive association was established between body weight, appetite changes ($p<0.001$), and sleep changes ($p<0.05$). Also, BMI was positively related to appetite changes ($p<0.001$). While MD adherence overall was not associated with PMS, specific dietary components such as wine consumption may be worth further investigation.

Keywords: Mediterranean diet, premenstrual syndrome, dietary patterns, women

Introduction

Premenstrual Syndrome (PMS) is defined by a range of physical, psychological, and behavioral symptoms that emerge during the luteal phase of the menstrual cycle and typically subside with the onset of menstruation, affecting about 30-40% of women of reproductive age [1]. It comprises signs that considerably disrupt a woman's daily functioning at any stage of her reproductive life and negatively affect her quality of life [2]. The most frequently experienced symptoms include anxiety, irritability, depressed mood, appetite changes, sleep problems, headache, nausea, vomiting, muscle and joint pain, weight gain, breast swelling and tenderness, edema, fatigue, acne, and diarrhea [3]. However, the mechanism underlying PMS has yet to be well known. Although hormonal fluctuations are commonly regarded as the primary cause, a variety of factors—including genetics, psychosocial influences, and lifestyle choices like smoking, alcohol intake, sleep duration, and eating habits—also play a role [4].

Available pharmacological treatments focus on reducing the severity of PMS, but some women may not accept these therapies due to possible adverse effects. Therefore, examining modifiable lifestyle factors that may alleviate or eliminate PMS symptoms is becoming increasingly important [5]. It seems diet is crucial in decreasing and managing some PMS symptoms. However, there is a lack of evidence on the actual effects that various foods have on women who suffer from menstrual disorders [6]. A high intake

CITATION
Yesildemir O, Arslan N, Dubus EN, Guner H. Relationship between premenstrual syndrome and compliance with the Mediterranean diet among women of reproductive age. Med Science. 2025;14(3):686-92.

Corresponding Author: Ozge Yesildemir, Bursa Uludağ University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Bursa, Türkiye
Email: ozgeyesildemir@uludag.edu.tr

DOI: 10.5455/medscience.2025.03.072

of fast food, sweets, fried foods, alcohol, and coffee is linked to the onset of PMS [7]. In a study of adult women, a Western-style diet rich in junk food, fried foods, soft drinks, snacks, and refined grains was related to an elevated risk of developing PMS [8]. On the other hand, consuming a diet abundant in vegetables, fruits, and fiber-rich foods is advised to help alleviate PMS signs [6].

The Mediterranean Diet (MD) emphasizes a high intake of fruits, vegetables, legumes, whole grains, olive oil, seeds, and nuts. It also includes moderate amounts of poultry, fish, and red wine whereas limiting the intake of dairy products, red meat, and sweets. It has been shown that compliance with the MD protects against the emergence of several diseases, particularly obesity and cardiovascular diseases [9]. Although it is suggested that the MD may have advantageous impacts on the prevention and management of PMS, there was a few evidence that higher compliance with the MD was related to a lower risk of PMS [2]. More research has examined the relationship between PMS and the main components of MD, such as fruits, vegetables, and fish, but their results are inconsistent [10,11]. Given the high prevalence of PMS among women of reproductive age and the increasing interest in the role of diet in women's health, investigating the potential relationship between overall MD adherence and PMS symptoms is necessary. Therefore, this study sought to examine the relationship between PMS and MD compliance among women of reproductive age.

Material and Methods

Study Design and Population

This cross-sectional study was carried out through an online survey involving 469 Turkish women of reproductive age between November 2023 and April 2024. As a result of the power analysis using the GPower 3.0.10 program, at least 350 samples were sufficient with 80% power and 5% margin of error. The survey was created using Google Forms and distributed via personal networks, word-of-mouth, and social media to collect data. The study included women aged 18 to 49 years who were of reproductive age, voluntarily consented to participate by selecting 'I agree to take part in this study' at the start of the survey, and completed all required data fields. Women were excluded if they met the following criteria: pregnancy, breastfeeding, use of oral contraceptives, antidepressants, or hormone replacement therapy. Ethical approval was obtained from Bursa Uludag University Ethics Committee for the study with decision number 2023/06 dated August 23, 2023. All procedures were carried out by the Declaration of Helsinki. The survey includes demographic information, anthropometric measurements, a Premenstrual Syndrome Scale (PMSS), and a Mediterranean Diet Adherence Screener (MEDAS).

Premenstrual Syndrome Scale (PMSS)

The PMSS, created by Gençdoğan in 2006, was designed to evaluate the intensity of PMS. The scale consists of 44 items, each rated on a five-point Likert-type scale, with responses ranging from 1 (never) to 5 (always). The Cronbach's alpha coefficient for the scale is 0.75. It includes nine subscales: anxiety, fatigue, depressive mood, irritability, depressive thoughts, pain, sleep changes, appetite changes, and swelling. The total PMSS score is obtained by summing the scores of all nine subscales. While the minimum possible score is 44, the maximum score is 220. A woman is classified as having PMS if her total PMSS score exceeds 50%, or 110 points [12].

Mediterranean Diet Adherence Screener (MEDAS)

The MEDAS, a 14-item scale created by Martínez-González et al. [13] in 2012 and later validated for the Turkish population by Pehlivanoğlu et al. [14] in 2020, is designed to assess adherence to the MD. It includes 12 questions about food consumption frequency and two questions about food consumption habits that are characteristic of the MD. Each question has a score of either 0 or 1. The total score on the MEDAS ranges from 0 to 14. Based on previous studies [15], adherence was categorized into three levels: scores below 7 were classified as low adherence, scores between 7 and 8 as acceptable adherence, and scores of 9 or higher as high adherence to the MD.

Anthropometric Measurements

Individuals' body weight and height were collected based on the declaration of the respondents. Body Mass Index (BMI) was calculated by dividing body weight by the square of height. BMI was categorized regarding World Health Organization classification: underweight (<18.50 kg/m^2), normal (18.50-24.99 kg/m^2), overweight (25.00-29.99 kg/m^2), and obese (≥30.00 kg/m^2) [16].

Statistical Analysis

Statistical analyses were conducted using IBM SPSS Statistics Version 28. The variables were presented as mean, standard deviation (SD), number (n), and percentage (%). The Kolmogorov-Smirnov test was employed to assess the normality of data distribution. Comparisons between two groups were performed using the independent samples t-test, while comparisons among more than two groups were conducted with One-way ANOVA. Differences between categorical variables were assessed using Pearson's chi-square test. Pearson's correlation analysis was used to examine associations between variables. A p-value of less than 0.05 was considered statistically significant.

Results

In this study conducted with 469 females, it was observed that 275 of the individuals had PMS (58.6%), while 194 did not experience PMS (41.4%). While the average total age of the respondents was 28.27±8.26, the mean age of PMS individuals (26.15±6.94) was lower than that of non-PMS individuals (31.27±9.04) ($p<0.05$). Nearly 90% of participants with PMS have a university or a more advanced degree, while this rate

DOI: 10.5455/medscience.2025.03.072

is about 80% in those non-PMS (p<0.05). The income status of females with PMS was lower than those with non-PMS (p<0.05). It was found that PMS participants consisted of more single (p<0.05). At the same time, no statistically significant variation was observed according to BMI classifications (p>0.05) (Table 1).

Table 1. Characteristics of the sample population according to premenstrual syndrome status

	PMS (n=275)	Non-PMS (n=194)	Total (n=469)	p
Age (years), mean±SD	26.15±6.94	31.27±9.04	28.27±8.26	<0.001
Educational status, n (%)				
Primary school	4 (1.5)	2 (1.1)	6 (1.3)	
Secondary school	2 (0.8)	3 (1.6)	5 (1.1)	
High school	23 (8.3)	29 (14.9)	52 (11.1)	**0.042**
University	211 (76.7)	125 (64.4)	336 (71.6)	
Post-graduate	35 (12.7)	35 (18.0)	70 (14.9)	
Income status, n (%)				
Low	77 (28.0)	32 (16.5)	109 (23.3)	
Middle	63 (22.9)	54 (27.8)	117 (24.9)	**0.014**
High	135 (49.1)	108 (55.7)	243 (51.8)	
Marital status, n (%)				
Single	195 (70.9)	96 (49.5)	291 (62.0)	**<0.001**
Married	80 (29.1)	98 (50.5)	178 (38.0)	
BMI (kg/m^2), mean±SD	23.00±3.86	23.51±4.99	23.21±4.36	0.058
BMI classification, n (%)				
Underweight	24 (8.7)	16 (8.2)	43 (9.1)	
Normal	185 (67.2)	129 (66.5)	314 (66.6)	0.756
Overweight	50 (18.3)	32 (16.5)	82 (17.5)	
Obese	16 (5.8)	16 (8.3)	32 (6.8)	

Independent samples t-test; Pearson's chi-square test; The bold values indicate statistically significant values (p<0.05); *PMS: premenstrual syndrome, BMI: body mass index

In the whole participants, the mean MEDAS score was 6.14±2.21, without differences between PMS groups (p>0.05). Only 14.7% of the sample showed a high adherence to MD, while 57.8% reported a low adherence. When MEDAS classification was analyzed, no notable variation was found between females with PMS and those without PMS (p>0.05) (Table 2).

Table 2. Mediterranean diet adherence of the sample population according to premenstrual syndrome status

	PMS (n=275)	Non-PMS (n=194)	Total (n=469)	p
MEDAS score, mean±SD	6.09±2.21	6.20±2.23	6.14±2.21	0.938
MEDAS classification, n (%)				
Low (<7)	162 (58.9)	109 (56.2)	271 (57.8)	0.836
Acceptable (7-8)	74 (26.9)	55 (28.4)	129 (27.5)	
High (≥9)	39 (14.2)	30 (15.6)	69 (14.7)	

Independent samples t-test; Pearson's chi-square test; *PMS: premenstrual syndrome, MEDAS: Mediterranean diet adherence screener

DOI: 10.5455/medscience.2025.03.072

The participants were asked if they consumed a specified food or food group serving in line with the items in MEDAS. Figure 1 illustrates the percentage of respondents who reported consuming a specific number of portions of a particular food. There was a notable difference between females with PMS and those without PMS as regards the amount of wine consumed ($p<0.05$).

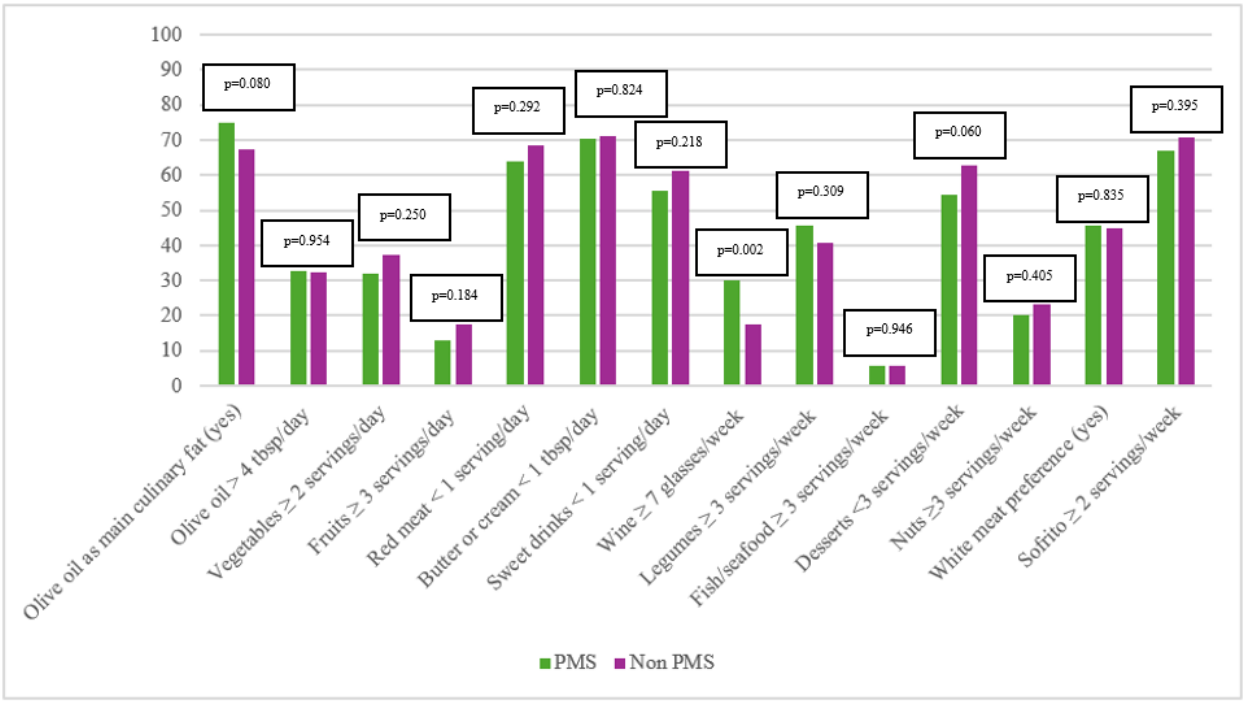

Figure 1. Percentages of sample population with PMS and non-PMS according to MEDAS items

As shown in Table 3, there were no variations in the PMSS total and subscales scores between MEDAS groups ($p>0.05$).

No statistically significant relationship was observed between the MEDAS scores and the total PMSS scores, as well as its subscale scores. A positive correlation was found for body weight with appetite changes ($p<0.001$) and sleep changes ($p<0.05$). Meanwhile, BMI showed a positive association with appetite changes ($p<0.001$) (Table 4).

Table 3. Associations between PMSS items by MEDAS categories

	MEDAS groups			p
	Low (<7) (n=271)	Accepteable (7-8) (n=129)	High (≥9) (n=69)	
	Mean±SD	Mean±SD	Mean±SD	
PMSS total	120.35±35.43	120.95±38.33	116.09±40.93	0.647
Depressive mood	20.32±6.96	20.22±6.76	19.64±8.24	0.773
Anxiety	14.28±7.10	14.44±6.27	14.21±6.94	0.963
Fatigue	18.85±6.03	18.66±6.55	17.28±6.71	0.177
Irritability	14.68±5.76	14.82±5.39	13.72±6.41	0.403
Depressive thoughts	16.49±7.50	16.68±7.44	15.84±7.90	0.747
Pain	8.46±3.38	8.57±3.95	8.35±3.55	0.908
Appetite changes	10.19±3.59	9.88±3.59	9.65±3.69	0.464
Sleep changes	7.78±3.42	7.68±3.46	7.57±3.70	0.887
Swelling	9.83±3.91	9.99±3.88	9.29±3.66	0.177

One-way ANOVA test; *PMSS: premenstrual syndrome scale, MEDAS: Mediterranean diet adherence screener

DOI: 10.5455/medscience.2025.03.072

Table 4. Relationship between PMSS, MEDAS scores, and some anthropometric measurements

	MEDAS		Body weight (kg)		BMI (kg/m²)	
	r	p	r	p	r	p
PMSS total	-0.032	0.485	0.023	0.618	-0.016	0.735
Depressive mood	-0.042	0.366	-0.077	0.098	-0.107	**0.020**
Anxiety	0.021	0.647	0.019	0.685	-0.012	0.799
Fatigue	-0.076	0.100	0.016	0.734	-0.023	0.613
Irritability	-0.039	0.394	-0.034	0.463	-0.052	0.263
Depressive thoughts	0.002	0.959	0.024	0.600	-0.006	0.900
Pain	-0.034	0.465	0.030	0.517	0.000	0.995
Appetite changes	-0.065	0.157	0.184	**<0.001**	0.164	**<0.001**
Sleep changes	-0.056	0.227	0.101	**0.029**	0.054	0.240
Swelling	0.054	0.244	0.019	0.679	-0.010	0.837

Pearson's correlation analysis; The bold values indicate statistically significant values ($p<0.05$); *BMI: body mass index, PMS: premenstrual syndrome, MEDAS: Mediterranean diet adherence screener

Discussion

In a sample of young women in Türkiye, no notable difference was observed in the MEDAS scores between the women with and without PMS. We also found that women with PMS had considerably higher adherence to wine intake (≥ seven glasses per week) than those without PMS, in addition to not a difference for other MEDAS items. However, there was a positive link between body weight and some PMS symptoms, like appetite and sleep changes.

Premenstrual symptoms are common, impacting approximately 50% of women of reproductive age globally [17]. A systematic review found that the prevalence of PMS was 47.8%, showing an upward trend from 1996 to 2011. Besides the lowest prevalence was revealed in France (12%), while the highest was in Iran (98%) [18]. Nascimento et al. (2020) also reported that the global prevalence of PMS stands at 47.8%, with 20% of women experiencing severe symptoms that disrupt daily activities, while the rest experience mild to moderate symptoms [19]. Moreover, a meta-analysis highlighted that the overall prevalence of PMS in Türkiye was 52.2% [20]. In our study, the prevalence of PMS was 58.6%. These discrepancies in prevalence may arise from characteristics of participants, cultural and geographical factors, variations in dietary habits, genetic predispositions, environmental conditions, and methodological differences in studies. However, more comprehensive research is required to interpret these findings accurately. Sociodemographic factors like age, income, education, and marital status may affect PMS. According to Erbil et al. (2023), 59% of high school students and 50.3% of university students suffer from PMS. The PMS symptoms are more severe in women aged between 25 and 35 years in comparison to other age groups [20]. This may be attributed to young individuals being more susceptible to hormonal fluctuations and possessing underdeveloped stress management mechanisms. This finding aligns with our study, where females with PMS (26.15 ± 6.94 years) were significantly younger than those without PMS (31.27 ± 9.04 years). Moreover, females with PMS had higher education levels, suggesting an association between education level and PMS. This finding is consistent with another study on participants from teaching hospitals in Tehran, in which higher education levels were related to more PMS symptoms [21]. Although our findings indicate that PMS severity increases with low income, there is conflicting data regarding the relationship between PMS and socioeconomic status [22,23]. We propose that other factors, such as stressful living conditions, may negatively impact PMS intensity in women with lower income levels. Additionally, the observation that PMS was more common among single people suggests that lack of social support and stressors associated with singlehood may influence PMS symptoms. This is consistent with our results, which show that single individuals experienced more PMS than married ones. Similarly, Bertone-Johnson et al. (2015) reported that married women experienced milder PMS symptoms, potentially due to social support mechanisms provided by marriage [24]. Although some studies, including ours, have found no association between anthropometric measurements and PMS [3,11], other research has identified high BMI, visceral fat, and body fat percentage and as risk factors for more severe PMS [25,26]. Although we did not observe a direct association between PMS severity and body weight or BMI, we observed that higher body weight was associated with increased appetite and poor sleep quality, which are the symptoms of PMS. A possible reason can be that the BMI of many respondents in our study was within the normal range. Therefore, further studies are to be conducted with underweight and obese women.

DOI: 10.5455/medscience.2025.03.072

Dietary and eating factors are modifiable variables that may be incorporated into the PMS management. Numerous studies have highlighted a notable connection between severity of PMS and dietary habits [2,3,27]. A study among adolescents reported that those with higher diet quality experienced lower severity of PMS symptoms, including depressive mood, anxiety, and sleep changes. Conversely, those with poor diet quality had a 3.33 times higher risk of PMS [3]. MoradiFili et al. (2020) found that a Western diet high in fast food, soft drinks, and processed meats increased PMS risk. In contrast, healthy diets were inversely associated with PMS risk [27]. Similarly, a study involving 262 Korean women aged 20-49 years revealed that a lower MD compliance was linked to a higher risk of developing PMS [2]. Unlike these findings, our study found no notable variations in MEDAS scores between the two groups, suggesting that overall MD adherence does not play a pronounced role in alleviating PMS symptoms. This may be related to the extremely low adherence to MD in the women participating in this study. This extremely low adherence to MD among participants may be attributed to several factors. Modern lifestyle changes, such as increased fast food consumption, time constraints, and a growing reliance on convenience foods, may hinder the adoption of healthier eating patterns. These potential contributing factors should be considered in future research to better understand barriers to healthy eating among reproductive-age women. However, the effects of specific dietary components were noteworthy. A positive relationship was observed between wine consumption and PMS symptoms, aligning with previous research linking alcohol consumption to PMS risk. Alcohol may elevate PMS risk by affecting gonadotropin and sex steroid hormones throughout the menstrual cycle, as well as disrupting the production of essential mood-regulating chemicals in the brain, such as serotonin. A meta-analysis by Fernández et al. (2018) found that moderate alcohol consumption was related to increased PMS risk, with higher consumption exacerbating this risk [28]. Additional studies are needed to explore the specific effects of wine, taking into account its polyphenols and other constituents.

Our study has some limitations. Firstly, because of its cross-sectional design, causal associations between MD compliance and PMS were not demonstrated. Second, although online surveys provide convenience in terms of implementation and accessibility, they may limit the representativeness of the sample, especially by excluding individuals with limited internet access or low digital literacy. Third, data on participants' existing medical conditions were not collected, potentially overlooking the influence of comorbidities on dietary patterns and PMS. Finally, the tools used to assess PMS diagnosis (PMSS) and MD adherence (MEDAS) relied on self-reported data, which carries a risk of misreporting. Psychological factors such as stress and anxiety, as well as physiological factors like hormonal changes, were not evaluated, which limits the comprehensive interpretation of the findings. Despite its limitations, our study is one of the few to evaluate the association between MD adherence and PMS in women. Further research is necessary to clarify the impact of dietary factors on PMS pathogenesis.

Conclusion

In conclusion, PMS is present in a substantial proportion of Turkish women. Women with PMS did not differ in their adherence to the MD compared to women without PMS. Gynecologists need to assess the dietary habits of such women and, if necessary, refer them to a dietitian as early as in routine clinical practice. We suggest following a healthy dietary pattern, which could help manage and prevent PMS. Considering the limitations of our study, future research should adopt longitudinal or interventional designs to establish causality, include more diverse populations to enhance generalizability, and incorporate clinical assessments alongside self-reports. Evaluating psychological and hormonal factors in conjunction with dietary patterns would also contribute to a more comprehensive understanding of PMS.

Conflict of Interests
The authors declare that there is no conflict of interest in the study.

Financial Disclosure
The authors declare that they have received no financial support for the study.

Ethical Approval
This study was carried out in accordance with the principles of the Declaration of Helsinki, after receiving approval from Bursa Uludağ University Health Sciences Research and Publication Ethics Committee (date: 23.08.2023, number: 2023/06).

References

1. Szmidt MK, Granda D, Madej D, et al. Adherence to the Mediterranean diet in women and reproductive health across the lifespan: a narrative review. Nutrients. 2023;15:2131.
2. Kwon YJ, Sung DI, Lee JW. Association among premenstrual syndrome, dietary patterns, and adherence to Mediterranean diet. Nutrients. 2022;14:2460.
3. Isgin-Atici K, Kanbur N, Akgül S, Buyuktuncer Z. Diet quality in adolescents with premenstrual syndrome: a cross-sectional study. Nutr Diet. 2020;77:351-8.
4. Yi SJ, Kim M, Park I. Investigating influencing factors on premenstrual syndrome (PMS) among female college students. BMC Womens Health. 2023;23:592.
5. Appleton SM. Premenstrual syndrome: evidence-based evaluation and treatment. Clin Obstet Gynaecol. 2018;61:52-61.
6. Siminiuc R, Ţurcanu D. Impact of nutritional diet therapy on premenstrual syndrome. Front Nutr. 2023;10:1079417.
7. Helmy NA, Kamel DM, Gabr AA, Shehata MM. Do dietary habits affect the premenstrual syndrome severity among a cohort of Egyptian females? A cross-sectional study. Bull Fac Phys Ther. 2023;28:11.
8. Farasati N, Siassi F, Koohdani F, et al. Western dietary pattern is related to premenstrual syndrome: a case–control study. Br J Nutr. 2015;114:2016-21.
9. Muscogiuri G, Verde L, Sulu C, et al. Mediterranean diet and obesity-related disorders: what is the evidence?. Curr Obes Rep. 2022;11:287-304.
10. Babakhani K, Sotoudeh G, Siassi F, Qorbani M. Comparison of vegetable intake in nurses with and without premenstrual syndrome: a case-control study. Shiraz E Med J. 2020;21:91319.

DOI: 10.5455/medscience.2025.03.072

11. Hashim MS, Obaideen AA, Jahrami HA, et al. Premenstrual syndrome is associated with dietary and lifestyle behaviors among university students: a cross-sectional study from Sharjah, UAE. Nutrients. 2019;11:1939.
12. Gençdoğan B. A new scale for premenstrual syndrome. Türkiye'de Psikiyatri Derg. 2006;8:81-7.
13. Martínez-González MÁ, Corella D, Salas-Salvadó J, et al. Cohort profile: design and methods of the PREDIMED study. Int J Epidemiol. 2012;41:377-85.
14. Özkan-Pehlivanoğlu EF, Balcıoğlu H, Ünlüoğlu İ. Turkish validation and reliability of Mediterranean diet adherence screener. Osmangazi Tıp Dergisi. 2020;42:160-4.
15. León-Muñoz LM, Guallar-Castillón P, Graciani A, et al. Adherence to the Mediterranean diet pattern has declined in Spanish adults. J Nutr. 2012;142:1843-50.
16. World Health Organization. Body mass index (BMI). https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/body-mass-index access date 02.02.2025.
17. Turan A, Güler Kaya İ, Çakır HB, Topaloğlu S. Prevalence and correlates of premenstrual syndrome and premenstrual dysphoric disorder among women aged 18-25 in Turkey. Int J Psychiatry. 2024;59:101-11.
18. Direkvand-Moghadam A, Sayehmiri K, Delpisheh A, Kaikhavandi S. Epidemiology of premenstrual syndrome (PMS)-a systematic review and meta-analysis study. J Clin Diagn Res. 2014;8:106-9 Erratum in: J Clin Diagn Res. 2015;9:ZZ05.
19. Nascimento AF, Gaab J, Kirsch I, et al. Open-label placebo treatment of women with premenstrual syndrome: study protocol of a randomised controlled trial. BMJ Open. 2020;10:e032868.
20. Erbil N, Yücesoy H. Premenstrual syndrome prevalence in Turkey: a systematic review and meta-analysis. Psychol Health Med. 2023;28:1347-57.
21. Saraei M, Shahrbabak ZM, Khalafi F, et al. Prevalence of premenstrual syndrome and related factors among nurses. J Turk Ger Gynecol Assoc. 2024;25:74-80.
22. Kumar R, Kumar R, Mazher S. Socio-demographic factors and premenstrual syndrome among women attending a teaching hospital in Islamabad, Pakistan. J Pioneer Med Sci. 2014;4:159-62.
23. Hamaideh S, Al-Ashram S, Al-Modallal H. Premenstrual syndrome and premenstrual dysphoric disorder among Jordanian women. J Psychiatr Ment Health Nurs. 2014;21:60-8.
24. Bertone-Johnson ER, Whitcomb BW, Rich-Edwards JW, et al. Premenstrual syndrome and subsequent risk of hypertension in a prospective study. Am J Epidemiol. 2015;182:1000-9.
25. Rad M, Sabzevary MT, Dehnavi ZM. Factors associated with premenstrual syndrome in female high school students. J Educ Health Promot. 2018;7:64.
26. Shahrjooye Haghighi E, Koushkie Jahromi M. The correlation between some body composition indices and premenstrual syndrome in young females. Women Health Bull. 2019;6:e83750.
27. MoradiFili B, Ghiasvand R, Pourmasoumi M, et al. Dietary patterns are associated with premenstrual syndrome: evidence from a case-control study. Public Health Nutr. 2020;23:833-42.
28. del Mar Fernández M, Saulyte J, Inskip HM, Takkouche B. Premenstrual syndrome and alcohol consumption: a systematic review and meta-analysis. BMJ Open. 2018;8:e019490.