Frequency and predictors of premenstrual dysphoric disorder and its association with affective temperaments

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SUMMARY

Objective: Premenstrual Dysphoric Disorder is a clinically important condition that affects a significant proportion of women and causes deterioration of quality of life. In this study, it was aimed to evaluate the frequency of premenstrual dysphoric disorder and its relationship with demographic and clinical variables and affective temperaments.

Method: An online survey form including sociodemographic data, Premenstrual Symptoms Screening Tool, and Temperament Evaluation of Memphis, Pisa, Paris, and San Diego Auto-questionnaire was applied to 408 healthy women participants.

Results: The frequency of premenstrual dysphoric disorder and moderate to severe premenstrual syndrome were 13.2%, and 14.5%, respectively. The presence of lifetime psychiatric diagnosis, positive family history of psychiatric illness, suicide attempts, and anxious temperament were significantly higher in the premenstrual dysphoric disorder group. Cyclothymic and anxious temperaments had a positive predictive effect on the Premenstrual Symptoms Screening Tool Section A scores.

Discussion: Our findings show a possible relationship between anxious and cyclothymic temperament traits and premenstrual dysphoric disorder symptom severity. Premenstrual symptoms may be more severe in women with cyclothymic and anxious temperament features. However, large-scale studies in which the diagnosis of premenstrual dysphoric disorder is determined by clinical interview are needed for this judgment.

Key Words: Premenstrual dysphoric disorder, premenstrual syndrome, affective temperaments, cyclothymic temperament, anxious temperament

INTRODUCTION

A monthly reproductive cycle of menstruating females consists of two simultaneously occurring cycles named follicular and luteal phases. Estrogen hormone which has high levels during the follicular phase directly affects brain functions and thereby affects women's cognitive and affective status (1). Similarly, progesterone has a role in neuro-regulation and these two reproductive steroids regulate the synthesis of neurotransmitters such as dopamine and serotonin. The cyclic changes in the blood level of these steroids due to the menstrual cycle result in emotional and behavioral alterations in most healthy women (2). Up to 90% of women have some physical and emotional complaints starting two weeks before menstruation and improving immediately after the onset of the menstrual period. In addition to physical symptoms such as headache, breast tenderness, or abdominal bloating; anxiety, depression, mood lability, concentration problems, fatigue, and feelings of "loss of control" may be listed (3). These symptoms are not always experienced to the same degree, some

women have mild symptoms while in others they may be debilitating (4).

Premenstrual symptoms usually begin with menarche, intensify between the ages of 25 and 35, and resolve during menopause (5). Premenstrual syndrome (PMS) affects approximately 80% of the female population, whereas premenstrual dysphoric disorder (PMDD), the more severe form, has a 3- 8% incidence (6). Because of the specific symptoms and the cyclic course, PMDD has been included in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) as a separate diagnostic entity of depressive disorders (7).

From a public health perspective, PMDD is an important health condition due to its frequent occurrence and impact on women's life. Symptoms cause significant interference with work, school, social activities, or relationships and negatively affect the quality of life. PMDD, especially on symptomatic days, is related to reduced work productivity and absenteeism (8). Women with PMS have a higher frequency of referral to outpatient healthcare providers, and accordingly, it has been reported that 2-year healthcare costs are $500 (9). Moreover, women with PMDD are considered a high-risk population for suicidality as reports show that suicidal thoughts or attempts are associated with experiences of PMDD independently of psychiatric comorbidities (10). A meta-analysis of ten studies showed that women with PMDD had an almost seven times higher risk of suicide attempt and nearly four times the risk of suicidal ideation. While women with PMS had an increased risk of suicidal ideation, a similar relationship could not be established with suicide attempt (11).

Temperaments are considered to be the inherited and biologically stable core of personality. While most temperamental models describe personality and emotional reactivity in general, the model of affective temperaments, specifically, are regarded as subclinical, trait-related characteristics and can be conceptualized as subclinical manifestations of major affective states, especially in their more apparent forms (12). Increasing evidence suggests a continuum, particularly between some affective temperaments and mood disorders (13). Despite its

strong biological basis, PMDD has a multifactorial etiology that is contributed by many psychosocial conditions such as trauma, temperament and character traits, and stressful life events, like many other mental pathologies (14-17).

The relationship between PMDD and affective temperaments within the cluster of mood disorders has been less studied compared to other mood disorders, and the findings are inconsistent. In a study conducted by Camara et al., it was reported that cyclothymic temperament was more associated with the diagnosis of PMDD. This difference remained significant even after adjusting for education status and oral contraceptive use (18). In a recent study, cyclothymic and anxious temperament showed a significant predictive effect for premenstrual symptoms. The authors suggested that affective temperaments play a mediating role in the effect of childhood maltreatment on PMS symptoms (19).

In the literature, knowledge regarding the relationship between PMDD and affective temperaments is not only lacking but also conflicting. Moreover, to the best of our knowledge, there has been no study conducted in Turkey. In this study, we aimed to determine the frequency of PMDD and PMS in a healthy female population in Turkey which has limited data on the epidemiology of these disorders. Secondly, it was aimed to investigate the relationship of PMDD with psychiatric and gynecologic variables as well as affective temperaments.

METHODS

Procedure

A cross-sectional online survey form was carried between October 2019 and February 2020. An online survey included sociodemographic data and variables related to the menstrual cycle, Temperament Evaluation of Memphis, Pisa, Paris, and San Diego Auto-questionnaire (TEMPS-A), and Premenstrual Symptoms Screening Tool (PSST) was prepared in the form of Google surveys. The survey targeted women who live in Ankara, Turkey, and the snowball technique was used to reach out to the respondents via e-mails

and social media networks. Social media users and people in the mailing lists who viewed the advertisement of the study were able to click on a universal resource locator (URL) link that took them to the survey. After consenting to participate in the study, participants were allowed to complete the survey form from any electronic device that had Internet access. After logging into the URL link, participants were taken to an introduction section where they were introduced to the study and provided with directions for filling out questionnaires. To improve the participation rate, the survey link was shared twice a month on mailing lists and social media networks. Participants were free to log off the study at any point. Completion of the questionnaires required approximately 30 minutes for all participants.

The inclusion criteria were being women between 18 and 50 years old and having the required level of education to fill in questionnaires. Those who were pregnant or in menopause were excluded from the study. Moreover, those with a history of chronic psychotic disorders such as schizophrenia were excluded from the study due to both its impact on consent and its devastating prognosis. In addition, since the aim of the study was to determine the affective temperaments, which are considered subthreshold mood components, those with a history of bipolar disorder were excluded from the study due to its confounding effect.

A total of 458 survey forms were turned back between October 2019 and February 2020. Two of the participants were excluded from the study because they had bipolar disorder. Ten patients were not included in the study because they were under the age of 18. Of the remaining participants, three were pregnant and 35 were in the menopausal period. As a result, 50 participants were excluded from the study and 408 patients constituted the study sample.

Ethical approval of this study was granted by the Ethical Committee of Gazi University on 10.05.2019 with the number of E.59828. This study is in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the World

Medical Association (WMA) Declaration of Helsinki – Ethical Principles For Medical Research Involving Human Subjects revised in 2013.

Instruments

The sociodemographic data form included questions about the participants' education and employment status, marital status, history of physical illness, lifetime psychiatric diagnosis, family history of psychiatric illness, suicidality, menstrual pattern, age of menarche, length of menstruation, oral contraceptive use, history of gynecological surgery and number of pregnancies. In questions about lifetime psychiatric diagnoses, participants were asked if they had a psychiatric illness diagnosed by a psychiatrist at any time. Self-reported psychiatric diagnoses were obtained with open-ended questions. Suicide attempts were considered situations in which a person performs a life-threatening behavior with the intent of endangering his or her life. The participants were asked about their average menstrual cycle duration and were asked to indicate whether there had an irregularity in terms of bleeding or duration. The continuation of each menstrual period with an average of 28-day cycles is considered regular, while differences in duration between cycles are considered irregular. The participants were asked to include the number of miscarriages while specifying the number of pregnancies.

Temperament Evaluation of Memphis, Pisa, Paris, and San Diego Auto-questionnaire (TEMPS-A): TEMPS-A is a 5-factor questionnaire that evaluates depressive, cyclothymic, hyperthymic, irritable, and anxious temperament consisting of 110 self-reported items (20). Turkish validity and reliability study was performed by Vahip et. al. Cronbach's alpha value ranged from 0.75 to 0.84 for 5 factors, and test-retest reliability was found to be between 0.73 and 0.93. Since the alpha value was <0.2, 10 items were removed from the questionnaire to preserve homogeneity between the items. As a result of the factor analysis, there was a significant overlap between the anxious temperament cognitive items and the depressive temperament items, while the anxious temperament somatic symptom items formed a separate cluster. As a result, depressive,

hyperthymic, irritable, cyclothymic, and anxious-nervous temperament factor structures were found to be valid for Turkish society (21).

Premenstrual Symptoms Screening Tool (PSST): PSST developed by Steiner et al. is a 19-item scale consisting of two sections. Section A, consisting of 14 items, was based on DSM-IV criteria for PMDD. In section B, there are five items on the effect of premenstrual symptoms on functionality (22). In the Turkish version, Cronbach's alpha value was found to be 0.928. As a result of the score they got on the scale, the participants were divided into three different groups as PMDD, moderate to severe PMS, and those with no/mild symptoms. PMDD group meets DSM-5 criteria for the diagnosis of PMDD. To meet these criteria, participants have to report at least one of the four core symptoms (irritability, dysphoria, tension, lability of mood) as severe and at least 4 additional symptoms (for a total of 5) as moderate to severe in section A. They also have to report that their symptoms interfered severely with their ability to function in at least one of five domains in section B. Moderate to severe PMS group meets reporting at least one of the four core symptoms as moderate to severe and at least four additional symptoms as moderate to severe in section A. They also have to report that their symptoms interfered moderately to severely with their ability to function in activities of daily living in at least one of the five psychosocial domains listed in Section B. Participants outside these two groups formed the no/mild PMS group. In post hoc analysis, the difference between the participants with no/mild symptoms and PMDD was preserved, while the difference between PMDD and the moderate to severe PMS group disappeared (23).

Statistical Analysis

Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) version 22.0 (IBM SPSS Corp.; Armonk, NY, USA). Descriptive values were stated as number (n), percentage (%), mean, and standard deviation (SD). The normal distribution of variables was examined visually (histogram and probability plots) and with analytical methods (Kolmogorov–Smirnov/Shapiro–Wilk test).

In all evaluations, nonparametric tests were used in the analysis of the data, since dependent variables (such as age, age of menarche, and the number of suicide attempts) did not show normal distribution. The Chi-square test was used to evaluate categorical variables. The Kruskal-Wallis test was used to compare continuous variables. Kruskal-Wallis results were used with the Mann-Whitney U test for the post-hoc evaluation of statistically significant variables. Multiple linear regression analysis was used to identify independent predictors of PSST Section A scores. An overall p-value of less than .05 was considered to show a statistically significant result.

RESULTS

A total of 408 women participated in this study. The sociodemographic and clinical characteristics of the participants are shown in Table 1. The mean age of the participants was 29.6±8.3. Most of the participants were employed (53.4%), single (57.1%), living with family (78.7%), and had 8-12 years of education (39.0%). 20.3% of the participants had a history of physical illness and only nine of them had a diagnosis of polycystic ovary syndrome. The frequency of lifetime psychiatric diagnosis was 20.3% and substance use was 3.9%. Among the participants diagnosed with any psychiatric disorder, the most frequent diagnosis was

Table 1. Sociodemographic and Clinical Characteristics of Participants

		N	%
Education (years)	0-8	104	25.5
	8-12	159	39.0
	12<	145	35.5
Employment status	Employed	218	53.4
	Unemployed	61	15.0
	Student	129	31.6
Marital status	Single	233	57.1
	Married	161	39.5
	Divorced	14	3.4
Living status	Alone	45	11.0
	With family	321	78.7
	With friends	30	7.4
	Others	12	2.9
Substance use		16	3.9
Physical diseases		83	20.3
Lifetime psychiatric diagnosis		86	21.1
Family history of psychiatric illness		48	11.8
Suicide attempts		12	2.9
Menstrual pattern	Regular	329	80.6
	Irregular	79	19.4
Use of oral contraceptives		22	5.4
Pregnancy history		136	33.3
Gynecologic surgery history		28	6.9
	N	Mean	SD
Age (years)	408	29.6	8.3
Number of suicide attempts	12	2.5	1.7
Age of menarche (years)	408	13.0	1.3
Length of menstruation (days)	408	5.6	1.6
Number of pregnancies	408	1.6	0.4

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Table 2. Comparison of premenstrual groups in terms of demographic and clinical variables

		PMDD (N=54)		Moderate to severe PMS (N=59)		No/ mild PMS (N=295)			
		N	%	N	%	N	%	x^2	p
Psychiatric variables	Substance use	5	9.3	1	1.7	10	3.4	5.081	0.079
	Physical diseases	12	22.2	8	13.6	63	21.4	1.980	0.372
	Lifetime psychiatric diagnosis	18	33.3	17	28.8	51	17.3	9.545	0.008
	Family history of psychiatric illness	13	24.1	8	13.6	27	9.2	10.004	0.007
	Suicide attempts	7	13.0	2	3.4	3	1.0	22.867	< 0.001
Gynecologic variables	Regular menstrual pattern	43	79.6	50	84.7	236	80.0	0.750	0.687
	Use of oral contraceptives	6	11.1	2	3.4	14	4.7	4.167	0.124
	Gynecologic surgery history	3	5.6	1	1.7	24	8.1	3.347	0.187
	Pregnancy history	14	25.9	12	20.3	110	37.3	8.406	0.078
TEMPS-A	Depressive	3	5.6	4	6.8	11	3.7	1.278	0.528
	Cyclothymic	2	3.7	1	1.7	2	0.7	3.578	0.167
	Hyperthymic	-	-	-	-	-	-	-	-
	Irritable	2	37	1	1.7	4	1.4	1.492	0.474
	Anxious	12	22.2	6	10.2	6	2.0	35.892	< 0.001
		Mean	SD	Mean	SD	Mean	SD	Z	p
	Age	27.0	8.5	27.3	7.4	30.4	8.3	-.262	0.002
	Number of suicide attempts	1.0	1.8	1.0	0.0	2.3	1.5	-2.681	0.239
	Age of menarche	12.9	1.5	12.7	1.3	13.0	1.2	-2.736	0.181
	Length of menstruation	5.7	1.5	5.8	1.3	5.5	1.6	-2.567	0.212

PMDD: Premenstrual Dysphoric Disorder, PMS: Premenstrual Syndrome, TEMPS-A: Temperament Evaluation of Memphis, Pisa, Paris, and San Diego Auto-questionnaire

depression (10.8%), and the others were anxiety disorders (7.4%), obsessive-compulsive disorder (0.9%), post-traumatic stress disorder (0.7%), and dissociative disorder (0.5%). A family history of psychiatric illness was present in 11.8% of the participants. 12 participants (2.9%) stated that they had attempted suicide at least once in their life. Of those, the mean number of suicide attempts was 2.5±1.7. When looking at gynecological parameters, 80.6% of the participants reported their menstrual patterns as regular. The prevalence of oral contraceptive use was estimated as 5.4%. Pregnancy rate among all participants was 33.3% and the mean number of pregnancies was 1.6±0.4. Having a history of gynecological surgery was present in 6.9% of the participants.

According to TEMPS-A, the most prevalent affective temperament was the anxious type (5.9%) and the second most was the depressive type (4.4%) in all participants. The prevalences of irritable and cyclothymic temperaments were 1.7% and 1.2%, respectively. There was no participant with a hyperthymic temperament. Based on the provisional diagnostic criteria according to the PSST, the fre-

quency of PMDD was estimated as 13.2%, moderate to severe PMS as 14.5%, and no/mild PMS as 72.3%.

To compare the PMDD, moderate to severe PMS, and no/mild PMS groups in terms of sociodemographic and gynecological variables and affective temperaments, the Chi-square test was used to evaluate categorical variables and the Kruskal-Wallis was used for continuous variables (Table 2). There was a significant difference between groups for mean age according to the Kruskal-Wallis test, and the Mann Whitney-U test was performed for post-hoc analysis which showed that the mean age of the no/mild PMS group was higher than both the PMDD and moderate to severe PMS groups. The presence of a lifetime psychiatric diagnosis, positive family history of psychiatric illness, and suicide attempts were significantly higher in the PMDD group than in the other groups. There were no significant differences among the groups in terms of substance use or physical diseases. Also, no significant difference was found in terms of gynecological variables such as menstrual pattern or pregnancy. There was no significant difference among the

Table 3. Multiple linear regression results for predicting PSST Scale Section A Scores

		t	p
Age (years)	0.139	2.146	0.033
Family history of psychiatric illness	0.122	2.836	0.005
TEMPS-A Cyclothymic temperament	0.383	5.791	< 0.001
TEMPS-A Hyperthymic temperament	-0.133	-2.768	0.006
TEMPS-A Anxious temperament	0.227	3.498	0.001

Adjusted R^2:0.284, PSST: Premenstrual Symptoms Screening Tool, TEMPS-A: Temperament Evaluation of Memphis, Pisa, Paris, and San Diego Auto-questionnaire

three groups in terms of affective temperaments except for the anxious type that which was significantly higher in the PMDD group than the others.

A multiple linear regression model was conducted to examine the independent effects of predictors on PSST Section A scores (Table 3). It was found that a significant regression model of the variance in PSST scores was explained by independent variables (p<.001, and adjusted R^2 =0.284). Multicollinearity was denied in this multiple regression analysis. Independent factors were age, substance use (0=not having, 1=having substance use history), physical illness (0=not having, 1=having a physical illness), lifetime psychiatric diagnosis (0=not having, 1=having a lifetime psychiatric diagnosis), family history of psychiatric illness (0=not having, 1=having family history of psychiatric illness), suicide attempt (0=not having, 1=having a previous suicide attempt), menstrual pattern (0=regular pattern, 1=irregular pattern), oral contraceptive use (0=not taking oral contraceptives, 1=taking oral contraceptives), pregnancy history (0=not having, 1=having a pregnancy history), and mean scores of TEMPS-A subscales. Results of the regression showed that age, family history of psychiatric illness, TEMPS-A cyclothymic, hyperthymic, and anxious subscales were significant predictors of PMDD. Cyclothymic and anxious subscales positively predicted PMDD whereas hyperthymic scale scores negatively predicted PMDD.

DISCUSSION

In this study, the frequency of PMDD screened with PSST was found to be 13.2% and lifetime psychiatric diagnosis, family history of psychiatric illness, and suicide attempts were found to be significantly higher in the PMDD group compared to moderate to severe PMS or no / mild PMS groups. The frequency of anxious temperament was found to be significantly higher in the PMDD group. The main finding is that cyclothymic and anxious temperament scores had a positive predictive effect on the PSST Section A scores.

The frequency of PMDD and moderate to severe PMS were 13.2%, and 14.5%, respectively.

According to the DSM-5, PMDD is classified under depressive disorders, with an estimated incidence of 1.8 to 5.8 percent in women of reproductive age. DSM-5 requires prospective follow-up of at least two menstrual cycles for the diagnosis of PMDD but allows provisional diagnosis in the absence of follow-up (7). In clinical settings, it is difficult to follow up with patients for at least two cycles, which is why screening scales are used. The frequency of PMDD has been found between 4.9% and 22.35% in several studies with different screening scales (15, 18, 19, 24). This wide range of PMDD frequency can be explained by differences among studies, such as sample size, instruments used to measure PMS, education level, marital status, age, menstrual regularity, or use of oral contraceptives.

In the study conducted by Ducasse and colleagues, the frequency of PMDD was found to be as high as 22.35%, and the fact that the participants were composed of people who committed suicide may have affected these results (24). In another study, only university students with regular menstrual cycles were included and the frequency of PMDD was 10.2% (15). In a study conducted in Japan, the frequency of PMDD was found to be 4.9%. The mean age was 32.4 years, more than half of the participants were single and 74.5% had regular menstrual cycles (19). In our study, the mean age was 29.6 years and there were similar results in terms of marital status and menstrual pattern. However, in this study, no detailed information was given about the use of oral contraceptives, and it is known that oral contraceptive drugs are used in the treatment of PMDD symptoms (25). In our study, the use of oral contraceptives was quite low (5.4%), and this may have been effective in the difference in frequency rates from this study. In another study conducted in our country, the use of oral contraceptives was similarly low and the frequency of PMDD was found to be 15.2% (23).

In our study, 21.1% of the participants had a lifetime psychiatric diagnosis and, 2.9% had a history of a suicide attempt. These two parameters were significantly higher in the PMDD group. Symptoms of many mental health diseases overlap with PMDD symptoms, and it is known in the literature that other psychiatric diseases are also common in

patients with PMDD. In a study with a large sample, it was obtained that the most common psychiatric disorders that show comorbidity to the diagnosis of PMDD are nicotine addiction, anxiety, mood, and somatoform disorders (26). In another study, anxiety disorders were found to have the highest rate of comorbidity (27). Furthermore, in our study, 11.8% of the patients had a family history of mental illness and it was significantly higher in the PMDD group. Similarly, studies have shown that a family history of psychiatric illness and a family history of PMDD showed a more significant relationship in the PMDD group than in healthy controls (28, 29). A growing number of studies have found evidence that fluctuations in female sex hormones during the menstrual cycle are associated with suicidality (30-32). Furthermore, recent evidence suggests that individual susceptibility to cyclical changes in gonadal hormone levels may cause PMDD symptoms to occur in some women (17). Therefore, it can be said that PMDD patients have a higher risk of suicide. Studies have also shown that there is a significant relationship in terms of suicidal ideation, plan, or attempt in patients with PMDD than in patients without PMDD (33, 34).

According to TEMPS-A, 5.9% of the participants had an anxious temperament and the frequency of this temperament was significantly higher in the PMDD group. Anxious temperament correlates positively with harm avoidance and negatively with novelty-seeking (21, 35). Harm avoidance consists of different facets of anxiety in Cloninger's psychobiological model such as worry, fear of uncertainty, shyness, and fatigability (36). There are several reports in the literature on the relationship between harm avoidance with PMDD. In the study conducted by Hsu et al., no difference was found between PMDD and major depressive disorder groups in terms of harm avoidance, but it was reported that higher scores were obtained in both groups compared to healthy controls (16). Similarly, in some other studies, the harm avoidance scores of patients with PMDD were higher than the healthy controls (37, 38).

The frequency of cyclothymic temperament was 1.2% and there was no significant difference between groups. On the other hand, regression analysis showed that cyclothymic temperament scores had a positive predictive effect for PMDD. Cyclothymic temperament is accepted as a predisposing factor for the development of bipolar disorder (13). In comorbidity studies, bipolar affective disorder type 2 and cyclothymia were found to be higher in patients with PMDD (39). It has been reported that female patients with bipolar disorder with comorbid PMDD have more mood instability during pregnancy, postpartum period, and while using oral contraceptives (40). Moreover, the short s allele of the 5-HTT gene was detected with high frequency in both PMDD patients and individuals with cyclothymic temperament (41, 42). This evidence suggests an underlying link between cyclothymic temperament and PMDD, forming a common diathesis.

Cyclothymic and anxious temperament scores had a positive predictive effect on the PSST Section A scores. In a study conducted in Japan, similarly, both TEMPS-A cyclothymic and anxious temperament scores showed a significant predictive effect for PMDD (19). Anxious temperament consists of factor loads such as worrying about one's relatives, difficulty in relaxation, somatic anxiety, inclination to fear, and autonomous anxiety and describes an exaggerated personality disposition toward worrying (21, 35). On the other hand, cyclothymic temperament represents frequent mood changes in both polarities and a tendency to overreact to internal or external stimuli (43). Symptoms such as sudden mood changes, hypersensitivity to rejection, anxiety, and inner tension seen in individuals with these temperamental characteristics are also among the cardinal symptoms of PMDD (7). Furthermore, some authors have suggested the resemblance of PMDD to a subthreshold mixed affective state (18). It has been suggested that the mixed affective state consists of symptoms such as mood lability, irritability, psychic agitation, and inner tension, with the absence of psychomotor retardation (44). This cluster of symptoms also represents a mixture of cyclothymic and anxious temperament traits.

In another study, it was shown that predominantly cyclothymic temperament was more associated with the diagnosis of PMDD. In this study, affective temperaments were evaluated according to the

Affective and Emotional Composite Temperament (AFECT) model (18). According to this model, a matrix is formed that defines the boundaries of each affective temperament by allowing smooth transitions between them, and in the center, there are more stable euthymic, hyperthymic and obsessive temperaments. The lateral poles define unstable temperament characteristics such as cyclothymic and dysphoric temperaments (45). In this study, unlike our findings, no significant relationship was found regarding the relationship between anxious temperament and PMDD. The AFECT scale allows for categorical assessment, determining which of the 12 temperament profiles is best suited to represent a person's affective temperament (45). On the other hand, TEMPS-A evaluates five different affective temperaments, and the cut-off point for each temperament was accepted as z-scores above the positive 2 SD (21). Therefore, the evaluation of different affective temperament models may have been effective in this difference.

There are some limitations in this study. First, no structured interviews were conducted with the participants in terms of psychiatric diseases, this may have affected the frequency of psychiatric diseases which consisted of only women who were previously diagnosed by a psychiatrist. Second, participants with PMDD were not followed up for two cycles prospectively. However, DSM-5 allowed provisional diagnosis of PMDD, and structured interviews and prospective follow-up are difficult in this study with a large number of participants. Third, hormonal changes in the biological etiology of premenstrual symptoms have a large place in the literature. The lack of hormonal parameters in this study is an important limitation. It will be more enlightening to include hormones such as FSH, LH, E2, Progesterone, PRL, which have a wide place in this subject, as variables in future studies. Moreover, patients were not evaluated separately in terms of follicular or luteal phases. This may have affected the evaluation of the severity of premenstrual symptoms. On the other hand, the PSST is a valid screening measure at any time of the menstrual cycle. Nevertheless, it should be kept in mind that PSST is a screening test and therefore may not reflect the real diagnoses. Finally, it is very difficult to generalize these data, since there is no sociocultural stratified selection in this research conducted over the internet. Therefore these results may not represent the population features, making it impossible to identify a causal relationship between PMDD and other variables.

Our findings show a possible relationship between anxious and cyclothymic temperament traits and PMDD symptom severity. Premenstrual symptoms may be more severe in women with cyclothymic and anxious temperament features. However, since there was no structured interview for PMDD diagnosis in this study, it is rational to interpret the results cautiously. Since different scales and temperament models are used in studies on the relationship between affective temperaments and PMDD, a common conclusion cannot be reached. Therefore, in future studies, affective temperaments of individuals diagnosed with PMDD according to standard DSM-5 criteria should be examined cross-sectional community-based studies using more valid temperament models.

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