



# Personality Characteristics in Female Students with Premenstrual Dysphoric Disorder and Premenstrual Syndrome

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## Abstract

Premenstrual dysphoric disorder (PMDD) and severe premenstrual syndrome (PMS) are from prevalent problems in women that cause impairment in many aspects of their life. This research aimed to study personality characteristics of female students with premenstrual syndrome and severe premenstrual dysphoric disorder. The sample of the study consisted of 210 female students of Shahed University in Tehran, Iran. They completed The NEO Five-Factor Inventory (NEO-FFI), Premenstrual Symptoms Screening Tool (PSST) and demographic form. Data were analyzed using MANOVA. 10.2 % of participants suffered from PMDD, 32.1% of participants have PMS and 57.2% were free of symptoms. There were significant differences in neuroticism between students with moderate to severe PMS and PMDD, and students who are free of symptoms or have mild PMS. There was also significant difference in agreeableness between individuals with PMDD and those who are free of symptoms/ have mild PMS. In conclusion, personality characteristics (including Neuroticism and Agreeableness) should be considered as the psychological factors that effect on incident and severity of PMS and PMDD.

## INTRODUCTION

Premenstrual changes are characterized by a set of physical and psychological symptoms which occur during the late luteal phase of menstrual cycle periodically [1]. Affective lability, irritability/anger/interpersonal conflict, depressed mood/hopelessness/self-deprecating thoughts, or anxiety/tension/keyed up or on edge, decreased interest, concentration difficulties, fatigue/low energy, change in appetite and sleep, feeling overwhelmed/out-of control, and physical symptoms are important for diagnosis [2].

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), PMDD is a depressive disorder with an incidence of 1.8 to 5.8 percent of reproductive-aged women. The symptoms are severe enough to cause significant distress and functional impairment [2]. Premenstrual syndrome is milder than PMDD [3], with a broader clinical category [2]. Physical and behavioral changes but not mood symptoms are necessary in diagnosis of PMS [2]. The premenstrual syndrome affects up to 80 percent [2]. But severe PMS has been reported 8.9% to 38.8% in different studies in various countries [4-10]. In a recent

study in Iran, the prevalence rate of PMS, severe PMS and PMDD was 96.6, 38.8 and 5.2 respectively, among the students of University [9].

Premenstrual dysphoric disorder and severe PMS effect on health-related quality of life of the women [11]; they can result in profound impairment in educational performance [12], occupational settings (i.e. work absence and reduced productivity), with lifestyle and relationships [11, 13].

The etiology of premenstrual problems has been proposed to be bio-psycho- social [14]. In terms of psychological factors, some studies [15-18] have suggested that PMDD and PMS are associated with personality characteristics; but there are controversial results in this regard. For example, in the study conducted by De Beradis et al [15], alexithymia was predictor of severity of PMDD. Bond, Critchlow, and Wingrove [16] reported that verbal and physical aggression is more frequent in women with PMDD compared to the controls. Moreover they had a higher lifetime history of aggression. Elevations of some personality dimensions like harm avoidance and novelty seeking [17] neuroticism [18] and perfectionism [19] also have been reported to had a negative impact on

existing and severity of premenstrual changes. In contrast to above reports, in a survey of 249 general practitioners, only about half believe that women with premenstrual symptoms could be distinguished by particular personality traits [19]. Despite the high prevalence of PMS and PMDD in Iran [9, 20], the examination of the relationship between personality characteristics and PMS and PMDD has received little attention.

University students are the future builders of any society, they attempt to make better future for themselves and satisfy their need to actualization. Therefore, it is very important to identify and address their problems. About half of Iranian university students are female, and premenstrual problems could impair their educational performance and other aspects of their lives. Therefore the present study was performed to evaluate personality characteristics in female students with PMDD and PMS.

## METHODS

This cross sectional study was conducted over a period of 12 months from 2016 to 2017. The sample of the study consisted of 214 female students of Shahed University in Tehran/Iran, with the mean age of 23.64 ( $\pm 3.53$ ) years. They were chosen by multistage cluster sampling method. In order to do so, first, three faculties were selected randomly from eight faculties of this university. Then, in each faculty, four classes were selected randomly, and all female students of these classes were considered as sample.

Inclusion criteria were the age range of 18-35 years, having regular menstrual cycles (24 – 35 days), not being pregnant or lactating, and willingness to cooperate at the study. The participants were informed of their right to refuse from participating in the study. All the personal information was kept confidential.

Each subject was asked to complete the Persian version of PSST [21], NEO-FFI [22], as well as a questionnaire to obtain demographic data about age, level of education, marital status, residence, and information about menstrual cycles and being pregnant/lactating or not.

### Instruments

#### Premenstrual Symptoms Screening Tool (PSST)

This instrument is a premenstrual symptoms screening tool designed by Macdougall, and Brown [21] to identify the women who suffer from severe PMS/PMDD. The first section of the scale is a checklist consists of 14 items that inquire about the experience of the premenstrual symptoms; in the second section, the women are asked if these symptoms interfere with five domains of work efficiency or productivity, relationships with coworkers, relationships with their families, social life activities and/or home responsibilities. The second section consists of 5 items. The items of two sections are rated on a four-point

Likert scale (from 1=not at all, to 4=severe). Some criteria must be present for the diagnosis of PMDD or moderate to severe PMS as follow:

For a diagnosis of PMDD:

At least one of the items of 1, 2, 3, and 4 is severe.

In addition at least four of 1 to 14 are moderate to severe

At least one A, B, C, D, E is severe

For a diagnosis of moderate to severe PMS:

At least one of 1, 2, 3, 4 is moderate to severe

In addition at least four of 1 to 14 are moderate to severe

At least one of A,B,C,D,E is moderate to severe

Hashemi, Talepasand, Alavi [23] assessed the psychometric properties of the scale in an Iranian population. Cronbach's alpha was 0.9 and test-retest reliability was 0.56 in their study. Agreement coefficient between psychiatrist diagnosis and the PSST diagnosis reported to be 0.31 for the PMS; and 0.80 for the PMDD. This tool discriminate the PMS and PMDD groups from healthy group well. In the study conducted by Yen et al [24], Cronbach's alpha was 0.96 for 14 symptoms of PMDD and 0.91 for 5 symptoms of function. In the present study, we assessed the internal consistency of the PSST; Cronbach's alpha, was 0.94 in the current study.

#### NEO Five-Factor Inventory (NEO-FFI)

It is a personality inventory, assesses the Big Five personality traits: Extraversion (E), Agreeableness (A), Conscientiousness (C), Neuroticism (N), and Openness to Experience (O). It is comprises 60 items (12 items per subscale). It is a revised and shortened version of NEO Personality Inventory designed by Costa and McCrae's [21]. Each item rates on a five-point Likert scale from "1=strongly disagree" to "5=strongly agree."

The internal consistencies were N=0.85, E=0.80, O=0.68, A=0.75, C=0.83 in the study by Sherry et al. [25]. In a study in Iran, by Garousi [26], the reliability (internal consistency) of the subscales of C, A, O, E, N were 0.75, 0.83, 0.8, 0.79, 0.79 respectively.

#### Data Analysis

Data were analyzed using MANOVA and the Fisher's exact test. Statistical analyses were carried out using *SPSS Version 16* software package (SPSS, Inc., Chicago, IL, USA).

## RESULTS

Among the individuals who received questionnaire (n=250), 243 individuals (97.2%) returned their questionnaires, and among returned questionnaires, 214 were complete (Fig. 1). None of students excluded from study because of irregular menstrual cycle, being pregnant or lactating, or having age outside the determinate age range. Participants' demographic features listed in Table 1. As be seen in table1, 10.2 % of participants suffered from PMDD, 32.1% of participants had moderate to severe PMS, and 57.2% had mild PMS

or were free of symptoms. There were no significant differences between three subgroups in level of education, marital status, and residence (Table 1).

The mean ( $\pm$ SD) scores of different personality characteristics in each subgroup inserted in table 2. Result of MANOVA showed that there were significant differences between three subgroups in some personality characteristics (Table 3). To find out the source of these differences, Scheffe's Post Hoc Comparison test was conducted. The findings showed that there were significant differences in neuroticism between students with moderate to severe PMS and PMDD, and students with mild PMS / those who are free of symptoms. Moreover there was significant difference in agreeableness between individuals with PMDD and students with mild PMS / those who are free of symptoms. There were no significant differences in other personality characteristics between the paired means (Table 4).

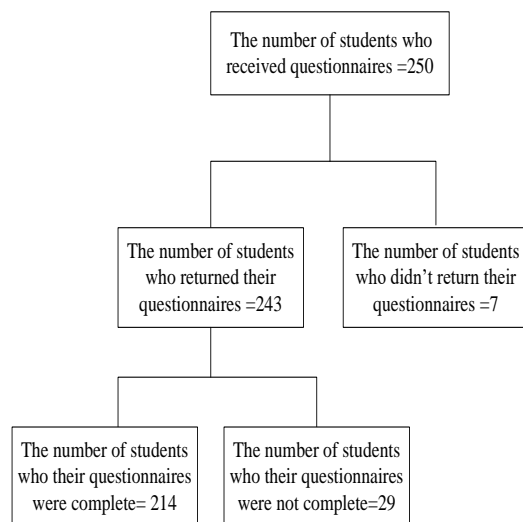


Figure 1. The Flowchart of Sampling Procedure

## DISCUSSION

The results of the present study showed that 10.2% of students diagnosed as suffering from PMDD, and 32.1% had moderate to severe PMS. Due to the use of different instruments, the prevalence of PMS and PMDD are various in different studies. However, our results are consistent with several studies [9, 20, 21] which used PSST to assess the premenstrual problems and reported a prevalence of moderate to severe PMS in a range of 20.7 to 38.8% and a prevalence of PMDD in a range of 5.1 to 15.9. In terms of personality characteristics, the findings showed that students with PMDD, and moderate to severe PMS had significantly higher scores in neuroticism compared to students with mild PMS or those who were free of symptoms. This result is in line with the findings of the studies conducted by Gingnell, Comasco, Orelund, Fredrikson, Sundström-Poromaa [27], Essa [18] and Hallman, Orelund, Edman, Schalling [28] that found higher level of neuroticism (or characteristics related to neuroticism) in women with PMS or PMDD compared to healthy controls.

Neuroticism is the trait-like tendency to experience frequent negative emotion and a perceived inability to cope in response to stress [29]. Again, stress can play an important role in individual vulnerability to premenstrual syndrome and exacerbation of symptoms [30]. Tschudin, Bertea, and Zemp [5] reported that psychological distress was strongly associated with both PMS and PMDD. Ussher et al. [31] and Hunter [14], in this regard, suggest that physical and psychological distress associated with premenstrual symptoms can be compounded by woman's cognitive appraisal (i.e., the meaning of these symptoms to her). For example, if she believes that she doesn't have control over her bodily changes and she is victimized by them, negative mood, focus on negative events, and need for control, increase [14, 31].

Table 1. Participants' Demographic Features and the Prevalence of Premenstrual Symptoms

Demographic variable	PMDD (n=22)	Moderate to Severe PMS (n=69)	Free of symptoms/ Mild PMS (n=123)	Total (n=210)	P-value
<b>Education</b>					0.8
Bachelor	12 (54.54)	33 (47.82)	52 (42.27)	97 (47.54)	
Postgraduate	10 (45.45)	35 (52.17)	66 (57.72)	107 (52.45)	
<b>Marital status</b>					0.2
Single	17 (10.17)	51 (30.53)	99 (80.48)	167 (79.52)	
Married	4 (9.52)	18 (42.85)	20 (16.26)	42 (20.47)	
<b>Residence</b>					0.6
Live in dormitory	17 (77.27)	46 (66.66)	86 (72.35)	149 (70.95)	
No live in dormitory	5 (22.72)	21 (30.43)	31 (27.64)	57 (29.04)	
<b>Diagnosis</b>	<b>PMDD</b>	<b>Moderate to Severe PMS</b>	<b>Free of symptoms/ Mild PMS</b>	<b>Total</b>	
	22 (10.2)	69 (32.1)	123 (57.2)	214 (99.5)	

Data in table are presented as No. (%).

Table 2. Mean ( $\pm$ SD) Scores of Personality Characteristics

Diagnosis	Neuroticism	Extraversion	Openness	Agreeableness	conscientiousness
PMDD	39.54( $\pm$ 6.52)	39.68( $\pm$ 7.69)	39.81( $\pm$ 6.1)	40.13( $\pm$ 6.37)	42.86( $\pm$ 7.41)
Severe PMS	35.98( $\pm$ 8.06)	39.63( $\pm$ 6.42)	39.83( $\pm$ 4.39)	42.61( $\pm$ 4.81)	43.77( $\pm$ 6.67)
Free of symptoms/ Mild PMS	31.91( $\pm$ 7.72)	41.94( $\pm$ 5.89)	39.97( $\pm$ 5.27)	44.11( $\pm$ 4.7)	45.23( $\pm$ 6.25)

**Table3.** Results of Multivariate Analysis of Variance (MANOVA)

Source	Value	F	Hypothesis df	Error df	sig
Pillai Trace	0.99	8.4	5	201	<0.001
Wilks' lambda	0.005	8.4	5	201	<0.001
Hotelling's Trace	209.16	8.4	5	201	<0.001
Roy's Largest Root	209.16	8.4	5	201	<0.001

**Table4.** Results of Post-Hoc Analysis Using Scheffe's Test

Diagnosis	PMDD	PMS	Free of symptoms
<b>Neuroticism</b>			
PMDD	-	3.56	7.63**
PMS		-	4.07*
None			-
<b>Extraversion</b>			
PMDD	-	0.049	-2.25
PMS		-	-2.3
None			-
<b>Openness to experience</b>			
PMDD	-	-0.02	-0.15
PMS		-	-0.13
None			-
<b>Agreeableness</b>			
PMDD	-	-2.48	-3.98*
PMS		-	-1.5
None			-
<b>Conscientiousness</b>			
PMDD	-	-0.91	-2.37
PMS		-	-1.45
None			-

\*. The Mean Difference is Significant at the .05 Level.

\*\*. The Mean Difference is Significant at the .001 Level.

We also found that students with PMDD had lower scores in agreeableness compared to students with mild PMS/ those who are free of symptoms. Agreeableness reflects the individual differences in cooperation and social harmony [32, 33]. It is possible that social support mediates the relationship between agreeableness and PMDD; greater social support that received by women with higher level of agreeableness, may be associated with less possibility to develop PMDD or decrease in severity of premenstrual problems over time. It is reported that women who receive lower level of social support are likely to experience premenstrual changes more severely [18]. Mediating effect of social support in the relationship between personality characteristics (neuroticism and agreeableness) and depressive symptoms has been reported in some studies [32, 33]. However mediating role of social support in the relationship between neuroticism and agreeableness with PMDD requires further research.

In the current study, there was no difference in conscientiousness between paired groups, albeit we also didn't find any correlation between conscientiousness dimension and PMS or PMDD in existing literature. Our results also didn't show significant difference between paired groups in openness dimension. By contrast Freeman et al. [17] reported higher scores on novelty seeking dimension (which has analog with openness) in women with PMS compared to a normative female sample. Moreover high scores in novelty seeking were associated with mood swings, food cravings and headaches. In terms of extraversion, our

results didn't show significant difference between the groups. By contrast, Hallman et al [28] found lower level of socialization in women with PMDD. The various results in different studies may be due to variation in study population, sample size, methodology, instruments that used in gathering data, and etc.

Although the social support has been reported to effect on severity of premenstrual symptoms, and women who receive higher level of social support experience lower levels of premenstrual problems [18], we didn't find significant difference between students who were living in dormitory and those who were living with their families. It may be explained in this way that students who live in dormitory build a new network of support in this setting to help them get through the challenges they're facing. Moreover, the university has counseling centers situated on university and dormitory which are available for students to receive free support services.

We also didn't find significant difference between married students and those who were not married, in premenstrual symptoms. Jomehri et al (2010) also didn't find significant relationship between marital status and PMS in students [34]. The probable cause is that marriage could be a source of social support as well as a source of stress, especially if the woman is not understood by her spouse.

## CONCLUSIONS

In conclusion, our results show that personality characteristic (including neuroticism and

agreeableness) should be considered as psychological factors that effect on incident and severity of PMS and PMDD, along with other psychological and physiological factors. Understanding the relationship between personality dimensions and premenstrual changes has implications for identifying individuals who may be at risk for severe PMS and PMDD and developing Interventional strategies that help them to effectively cope.

Our study has some limitations: The participants were university students, therefore the findings should be generalized to other groups with caution. NEO Five-Factor Inventory and PSST are self-reporting measures; it is possible that participants were less than honest to appear more socially desirable; there is no definitive way to confirm the accuracy of the answers. However, assurances of anonymity and confidentiality were given to the participants before they completed the questionnaire.

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We appreciate the students for their cooperation in the study.

### Conflict of Interest

The authors declare no conflict of interest

### Funding

None.

### Ethical Consideration

After explaining both the procedures and purpose of the study, informed consent was obtained from the participants. The participants were informed of their right to leave the study at any time. The participants were allocated a code when they completed the questionnaire. All the personal information was kept confidential.

### Authors' Contributions

Maryam Izadi-Mazidi designed the study and searched the literature; Samaneh Amiri gathered the data; Maryam Izadi-Mazidi analyzed and interpreted the data; Maryam Izadi-Mazidi and Samaneh Amiri drafted the manuscript. Both authors read and approved the final manuscript.

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