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Research Paper

Personality Facets, Psychological Distress and Coping in Indian Females with Premenstrual Symptoms

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ABSTRACT

Background: Premenstrual symptoms are a biological fluctuation among menstruating females, possessing a substantial psychosocial basis. As an archetypal phenomenon shaping individual and societal perspectives of women, they require consistent study, particularly in the Indian context. The current study aimed to assess the relationship between the severity of premenstrual symptoms, personality facets, psychological distress, and coping among menstruating Indian females. **Methods:** Through purposive sampling, 111 women, between 20 and 40 years of age, from India, were included for the study. Standardized tools to assess personality facets, premenstrual symptoms, psychological distress, and coping were used. **Results:** Results indicated that the majority (65%) of the sample experienced mild/no premenstrual symptoms, almost a third (28%) experienced moderate extent of symptoms, and 7% experienced severe levels of symptoms. A significant positive relationship was identified between conscientiousness, depression, and premenstrual symptom severity. Significant differences in anxiety, stress, and neuroticism were identified between the no/mild symptoms, moderate symptoms, and severe premenstrual symptoms groups. Findings also suggest that maladaptive coping strategies may be a state-based deficit of the premenstrual period. **Conclusions:** The results suggest that premenstrual symptoms are not an isolated phenomenon, and carry key associations with broader mental-health concerns such as depression, anxiety, and stress, along with personality facets like neuroticism and conscientiousness. Hence the need for a holistic conceptualization and diverse interventions at various levels is indicated to reduce the burden of premenstrual symptoms and improve the quality of life of Indian women.

Keywords: *Premenstrual Symptoms, Personality, Psychological Distress, Coping, Women's Mental health, Indian women*

Key Messages:

- The study highlights findings regarding the prevalence of premenstrual symptoms- majority (64.9%) of the sample experienced mild/no symptoms, 27.9% experienced moderate extent of symptoms, and 7.2% experienced severe levels of symptoms.

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- A significant relationship was identified between conscientiousness, depression, and premenstrual symptom severity. Significant differences were identified among the three groups; no/mild symptoms, moderate symptoms, and severe symptoms, with regard to anxiety, stress, and neuroticism.
- Implications for diagnostic and therapeutic management are discussed in the light of relevant socio-cultural aspects. In the Indian context, where stigma about menstruation is widely prevalent, the study encourages expression and increases awareness about women's unique psychological experiences to facilitate change and empowerment.

Menstruation is a universal experience that is unique to the female sex's reproductive physiology. Reports of the United Nations Children's Fund state that 1.8 billion people across the world menstruate every month, while Indian statistics state that there are 355 million menstruating women and girls [1], which suggest that associated disturbances and diseases are a significant public health concern.

The menstrual cycle is maintained by the hypothalamic-ovarian-pituitary axis and consists of four phases: menstruation from day 1-5, follicular or proliferative stage from day 1- 13, ovulation phase on day 14, luteal phase from day 16- 28 [2]. Disturbance in the premenstrual phase has become an archetypal phenomenon that is at the core of society's perception and treatment of women. Having traversed several biased theories, such as that of the wandering uterus, menstrual madness, and ovarian mania [3], in the part of the early 21st century, the American Psychological Association (APA) recognized the condition as late luteal phase dysphoric disorder. Currently, premenstrual dysphoric disorder (PMDD), premenstrual syndrome (PMS), and premenstrual symptoms are among the spectrum of accepted terminologies [4].

Following the Diagnostic and Statistical Manual (DSM) IVth edition enlistment of PMDD as a condition for further study, the DSM V has categorized it as an affective disorder. Similar to the DSM IV, the DSM V criteria for PMDD include one of the following core symptoms for most menstrual cycles in the past year: affective lability, irritability, dysphoria, and anxiety symptoms that occur in a repetitive pattern during the premenstrual phase and subside few days after the onset of menstruation. Behavioral and physical disturbances along with functional impairment in work, school, and/or social relationships are reported. The manual also mandates daily prospective symptom ratings for at least two symptomatic cycles in order to provisionally diagnose the condition. An individual qualifies for the less severe condition of premenstrual syndrome (PMS) when physical or behavioral symptoms, with or without affective symptoms occur in a similar pattern of onset and remission [5]. Self-report tools such as the PMS calendars and the premenstrual symptoms screening tool are also used to assess PMS.

Since diagnostic clarity for PMDD and PMS has been achieved relatively recently, there is considerable information left to be explored about its psychological correlates. The DSM V also mentions the role of sociological factors such as gender roles, religion, and culture in the expression of symptoms, while possible psychological variables require greater scientific attention. Further, in the Indian context, preliminary epidemiological studies of college students indicated the overall prevalence of PMS to be 18.4%, moderate to severe PMS was 14.7% and PMDD was 3.7% [6]. A more recent 2019 study found higher prevalence rates;

moderate to severe PMS was 19.3% and PMDD was 4.6% [7]. These discrepancies warrant continued analysis in the Indian milieu.

The etiology of premenstrual disturbances is robust with biological underpinnings such as genetic loading, serotonin and GABA dysfunction, and variations in gray matter volume [8, 9, 10, 11, 12]. Morse in 1988 [13] conducted a factor structure analysis, and asserted that the manifestation of PMS is likely due to an interaction between hormonal parameters, environmental conditions, individual personality, coping capacity and follicular psychological distress. However, an analysis of these variables in the contemporary Indian context is necessary to understand the psychosomatic nature of the condition.

The construct of personality has received some research attention in association with PMDD, through studies of heritable personality and polymorphism of Estrogen Receptor alpha gene (ESR1) [14], neuroticism and polymorphism of the serotonin transporter gene, 5-HTTLPR [15]. Preliminary psycho-behavioral studies have identified personality dimensions of higher neuroticism and negative valence, and lower extroversion and conscientiousness in women with PMS [16]. With regard to comorbid personality disorders, inconsistent associations to all three clusters of personality disorders have been identified; avoidant, dependent, hysterical, schizoid, schizotypal, borderline, narcissistic, avoidant, and passive-aggressive traits and obsessive-compulsive personality disorder [17, 18]. These mixed findings suggest the possibility of dysfunctional personality traits associated with premenstrual symptoms.

Allopregnanolone (ALLO), a progesterone metabolite that is important for producing anxiolytic responses during stress, has been found to be reduced in individuals with PMDD, indicating challenges in coping with stress. Neurotic states of anxiety and depression, characteristic of bipolar affective disorder, major depression, dysthymia, anxiety disorders, and post-traumatic stress disorder have links to comorbid premenstrual disturbance [19]. Although rumination, particularly brooding, and anxiety sensitivity have been deduced to predict the syndromal manifestation of PMDD, the investigations were specific to diagnostic groups and cannot be directly translated to the general population [20]. An Indian prevalence study demonstrated a higher degree of perceived stress, generalized anxiety, and depression in school-going girls with PMDD, while such an analysis is lacking among older Indian women, with varied socio-developmental complexities [21]. Individual differences in coping with the stress of the premenstrual phase demarcate the clinical group from those who experience sub-threshold symptoms [22]. Despite evidence of a probable positive relationship between emotion-based coping, distancing, and flight-avoidance coping and premenstrual symptom severity [23], there are persisting questions about whether such deficits indicate a predominantly premenstrual state-related dysfunction or a pervasive coping difficulty [24].

Increased levels of anxiety, perceived stress, and neuroticism are identified in individuals with PMDD, as compared to those with PMS, with the latter group employing more instrumental support to cope with premenstrual symptomatology, however, these studies adopted a state-dependent model of coping and have accounted for only one dimension of personality [25, 26]

Although there are notable investigations about factors associated with PMS, studies about multiple predisposing and maintaining variables, and their combined associations to PMS

are scarce. The current study investigated two key hypotheses: there is a significant relationship between severity of premenstrual symptoms, personality facets, psychological distress, and coping among menstruating women, and there is a significant difference in personality facets, level of psychological distress, and coping based on the severity of premenstrual symptoms.

The findings from such an analysis would be useful in providing an inclusive model to understand premenstrual symptoms. Further, it would aid in tailor-making culturally relevant and gender-sensitive therapeutic interventions for primary prevention and tertiary clinical care for menstruating Indian women.

METHODOLOGY

Participant selection

Following approval from the Institutional Ethics Committee, a purposive sampling method was utilized to invite menstruating females in the age group of 20 to 40 years through online and in-person forums to obtain their informed consent. They were provided with details about the nature and purpose of the study, and the contact details of the principal investigator. Inclusion criteria comprised of menstruating females, who were between 20-40 years of age, with the ability to read English. Exclusion criteria included menstruating females below 20 and above 40 years of age, currently pregnant or lactating, or diagnosed with or under medication or other treatment for a major medical, gynecological, psychiatric or neurological condition for the past 6 months. As shown in figure 1, hundred and sixty women from India consented to partake in the study, of which 49 were excluded since they were below 20 years or above 40 years of age, pregnant or lactating, or diagnosed with or under medication or other treatment for a major medical, gynecological, psychiatric, or neurological condition in the past 6 months. A final total of 111 menstruating females were included and completed the questionnaires along with a semi-structured socio-demographic data sheet developed by the principal investigator which collected information regarding their age, gender, education, occupation, marital status, living arrangement.

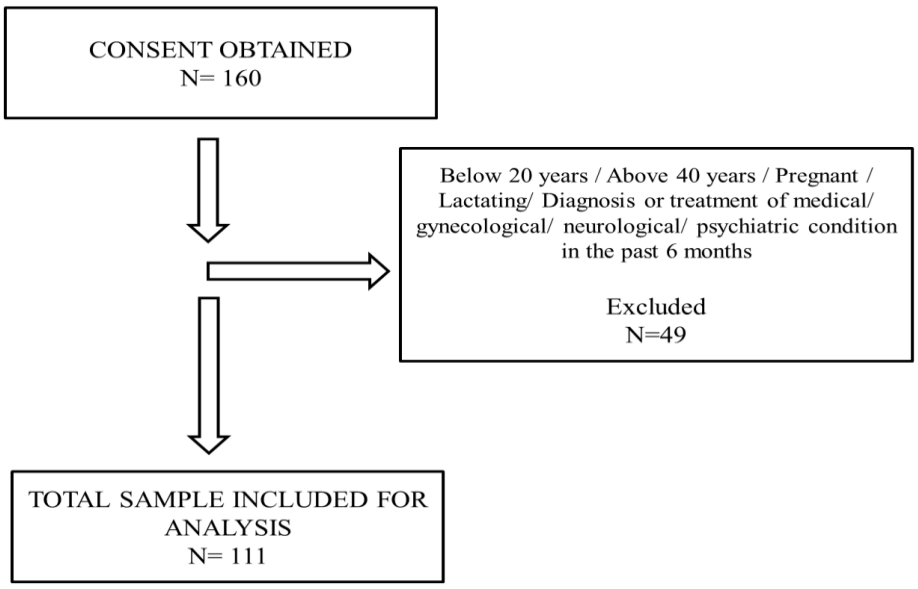


Fig 1: flowchart of sample inclusion and exclusion criteria

Tools

NEO Five Factor Personality Inventory (NEO-FFI): a 60-item, self-report version of the elaborate NEO-PI-R developed by Costa and McCrea, 2007, was used. It consists of five 12-item scales to assess each of the personality facets of the five-factor model: Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. The responses are marked on a five-point Likert scale from "strongly agree" to "strongly disagree" from 0 to 4. The total raw score for each facet is converted into T scores, further classified into profile categories such as "very low", "low". "average", "high" and "very high". The tool has been used extensively in behavioral research and in a considerable number of previous studies exploring premenstrual symptoms [14,27].

Depression, Anxiety and Stress Scales (DASS)- 21: is a 21-item, self-report measure of chronic vulnerability to three common psychological symptoms; depression; dysphoria, self-deprecation, anhedonia, inertia, etc, anxiety; autonomic arousal, skeletal muscle effects, anxious affect, etc, and stress; difficulty relaxing, agitation, irritability, etc. The tool has been authored by Lovibond and Lovibond, 1995, and has been well studied in the Indian context [28, 29]. It measures symptoms relevant to the particular emotional state over the past week. Participants were cautioned against not scoring these items based on symptoms experienced in the premenstrual period. Each of the items is scored on a four-point rating scale from "did not apply to me" to "applied to me very much or most of the time". A summation of the relevant scores gives a value for the particular subscale, and is interpreted as normal, mild, moderate, severe, and extremely severe.

Brief COPE Inventory: The Brief COPE Inventory is an abbreviated version of the COPE inventory created by Carver, 1997, consisting of 28 statements, to measure two broad coping styles; avoidant vs approach coping [30]. Avoidant coping is further divided into the following subscales: self-distraction, denial, substance use, behavioral disengagement, venting, and self-blame, and Approach coping, which bears the following subscales: active coping, use of emotional support, use of instrumental support, positive reframing, planning, and acceptance. Humor and religion are also included but are not part of either of the broader styles. Each item is scored on a 4-point scale, and indicates the individual's predominant manner of coping based on the style which receives the highest total score. Participants were informed to score the items based on their general manner of coping, and not with respect to specific premenstrual stressors.

Premenstrual Symptoms Screening Tool (PSST): was developed by Steiner et al in 2003 [4] as a quick and reliable screener for moderate to severe PMS and PMDD, and was used with permission. One Indian study in 2016 found that the PSST has 90.9% sensitivity, 57.01% specificity, and 97.01% predictive value of negative tests [6]. In one Iranian study, the reliability of the PSST as measured by internal consistency was found to be satisfactory as it obtained a Cronbach's alpha coefficient of 0.93, along with adequate content validity. The content validity as assessed by the content validity ratio was 0.7 and the content validity index was 0.8 [31]. The PSST translates the categorical DSM criteria into a rating scale. It contains 14 items to assess symptoms, which begin before the onset of menstruation and stops a few days after the onset of bleeding, and 5 items to assess related functional impairment. Participants are asked to indicate the severity of the experience of each premenstrual symptom, across four categories: "not at all", "mild", "moderate" and "severe". Based on the scores, the participants were identified to be part of the PMDD group (with severe symptoms and functional impairment), the PMS group (with moderate to severe

symptoms and functional impairment), or the no/mild symptoms group (with none or minimal symptoms and limited functional impairment).

Data Analysis

The data was analyzed using the Statistical Package for Social Sciences (SPSS) Statistics version 20.0. Descriptive statistics such as mean, standard deviation, frequency, and percentage were used to describe sample characteristics. On performing the Shapiro- Wilk test, the data was found to be non-normally distributed. To examine the first objective, a Generalized Linear Model (GLM) was computed to identify predictive relationships that exist between the independent and dependent variables. To study the second objective, a Kruskal-Wallis test was done to compute differences in personality, level of psychological distress, and coping based on the severity of premenstrual symptoms among menstruating women. The Kruskal-Wallis test was followed by a pairwise comparison to explore which groups among the three; no/mild symptoms group, moderate symptoms group, and severe symptoms group, were statistically different on the identified variables.

RESULTS AND DISCUSSION

Participant Characteristics

Table 1: Demographic Characteristics and Severity of Premenstrual Symptoms

Baseline characteristics	Frequency	Percentage (%)
Education		
UG*	37	33.3
PG**	60	54.1
Advanced	14	12.6
Occupation		
Employed	71	64
Unemployed	27	24.3
Student/Ph.D. scholar	11	9.9
Others (Internship & Freelance)	2	1.8
Family Setting		
Living alone	14	12.6
Living with friend/partner	15	13.5
Nuclear families	68	61.3
Joint families	14	12.6
Levels of severity of Premenstrual symptoms		
No/ Mild symptoms	72	64.9
Moderate symptoms	31	27.9
Severe symptoms	8	7.2

*UG: Undergraduate; **PG: Postgraduate

Figure 2: Distribution of participants across marital/ relationship status

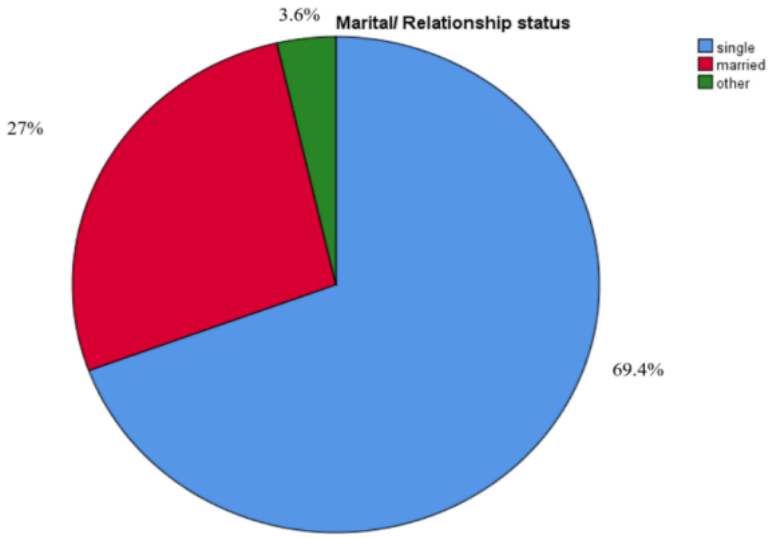
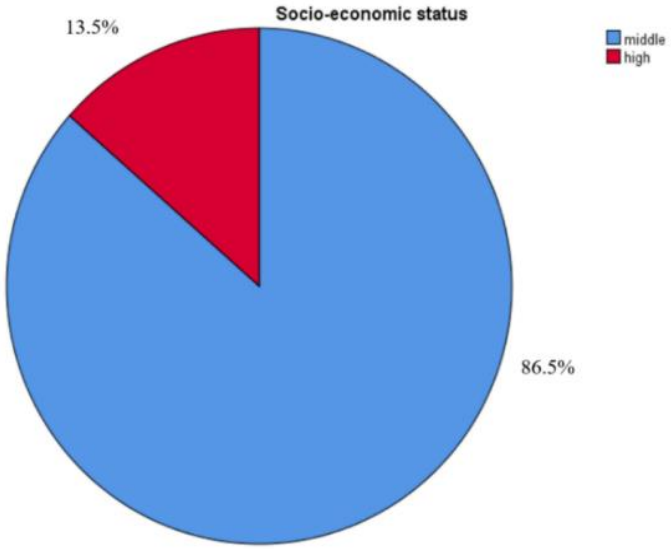


Figure 3: Distribution of participants across socio-economic status



The sample consisted of 111 menstruating women aged 20 to 40 years, with a mean age of 25.97 ± 4.63. As demonstrated in table 1, figure 2 and 3, the majority of them (54.1%) were educated up to the post-graduate level, employed (64%), single (69.4%), and living in a nuclear family setting (61.3%). Of the 111 participants, 64.9% experienced the symptoms only to a mild extent or did not experience the symptoms at all, a considerable number of the sample, 27.9% experienced the symptoms to a moderate extent, while 7.2% experienced a severe level of symptoms along with significant interference in work efficiency or productivity, interpersonal relationships, and social life activities. These rates are comparable to the prevalence identified in global literature; 65% of a similar age group had mild PMS symptoms [31], and 6.1% had more severe PMDD [32].

Relationship Among Severity of Premenstrual Symptoms, Personality, Psychological Distress, and Coping

Table 2: Relationship Among Severity of Premenstrual Symptoms, Personality, Psychological Distress, and Coping computed using the GLM

		Premenstrual symptoms	
Predictor Variables	**Level**	**Slope (B)**	**Sig.**
Neuroticism	Very Low	.085	.812
	Low	.408	.092
	Average	.202	.308
	High	.100	.571
	Very High	0	.
Extraversion	Very low	.255	.444
	Low	.384	.097
	Average	.050	.831
	High	.188	.408
	Very High	0	.
Agreeableness	Very low	-.326	.437
	Low	-.156	.706
	Average	-.247	.547
	High	-.285	.504
	Very high	0	.
Openness to Experience	Very low	.171	.796
	Low	.281	.174
	Average	.125	.426
	High	.211	.210
	Very high	0	.
Conscientiousness	Very low	-.202	.439
	Low	-.449	.055
	Average	-.196	.366
	High	-.530	**.024***
	Very high	0	.
Psychological Distress	Depression	.019	**.032***
	Anxiety	.002	.817
	Stress	-.029	.004
Coping	Approach coping	-.302	.172
	Avoidance coping	0	.

**. Significance at the 0.05 level*

With regard to personality, a significant relationship, F (1) = 5.104, p = .024, between the facet of conscientiousness and severity of premenstrual symptoms was identified. Compared to individuals who had a *very high level* of conscientiousness, those with a high level of conscientiousness had premenstrual symptoms which were of lesser severity. Eissa in 2011 [33] identified that perfectionism was associated with PMS. Gaion and Vieira (2011) studied PMS symptoms in Brazillian athletes [34]; high scorers were found to have increased sensitivity to minor bodily changes, viewing them as a hindrance to their ideal state. The facet of conscientiousness explored in the current study, encapsulates similar psychological constructs of perfectionism, and sensitivity to failure, along with reduced adaptability and

psychological inflexibility, and is found to be associated with increased premenstrual distress.

A significant relationship between depression and premenstrual symptoms has been identified. Similar findings have been obtained in previous studies, of association and prediction; women with high menstrual-related symptoms were significantly more likely than those without to report frequent depression, insomnia, excessive sleepiness over a 12-month period [35], and depressed mood has also emerged as a significant predictor of premenstrual distress [36]. A clinical diagnosis such as dysthymia and major depressive disorder occurs more frequently in women with PMDD [37]. The core affective symptoms of the most severe form of this condition are reaffirmed in the current findings.

With regard to coping styles, it was seen that those individuals who endorsed an approach coping style were found to have less severe premenstrual symptoms compared to those who endorsed an avoidant kind of coping, however, the results were not statistically significant. The results throw light on the speculation that the maladaptive coping strategies used by women with PMS and PMDD [22, 23] could be limited to the premenstrual phase, and do not indicate pervasive coping deficits. Studies have also identified that women with PMDD appraised daily stressors as being more stressful premenstrually than postmenstrually, as compared to controls [38].

Difference among Personality, Psychological Distress, and Coping based on Severity of Premenstrual Symptoms

Table 3: Difference among Personality, Psychological Distress, and Coping based on the Three Levels of Premenstrual Symptoms Severity

Variables		**Test Static**	**Adjusted Significance**
Personality	Neuroticism	8.741	**0.013***
	Extraversion	1.445	0.485
	Agreeableness	2.269	0.322
	Openness to Experience	4.027	0.134
	Conscientiousness	0.394	0.821
Psychological distress	Depression	3.831	0.147
	Anxiety	8.898	**0.012***
	Stress	8.600	**.014***
Coping	Approach Coping	.007	0.997
	Avoidant Coping	5.102	0.078

**. Significance at the 0.05 level*

According to Table 3, there is a statistically significant difference in Neuroticism, H (2) =8.741, p= *.05*, anxiety, H (2) = 8.898, p<.05, and stress, H (2) = 8.600, p< .05, across the three groups of premenstrual symptoms.

Table 4: Pairwise Comparisons among the Three Groups of Premenstrual Symptoms Severity based on Scores of Neuroticism, Anxiety, and Stress

Variable	Sample 1-Sample 2	Test Statistic	Std. Error	Adj. Sig.
Neuroticism	No/Mild symptoms group – Moderate symptoms	11.509	6.908	0.287
	No/Mild symptoms group – Severe symptoms	32.292	11.985	**0.021***
	Moderate symptoms – Severe symptoms	20.782	12.753	0.310
Anxiety	No/Mild symptoms -Severe symptoms	8.000	11.961	1.000
	No/Mild symptoms - Moderate symptoms	20.538	6.894	**.009***
	Severe symptoms-Moderate symptoms	-12.538	12.727	.974
Stress	No/Mild symptoms to- Moderate symptoms	14.390	6.901	.111
	No/Mild symptoms to- Severe symptoms	28.646	11.972	**.050***
	Moderate symptoms-Severe symptoms	14.256	12.740	.789

**. Significance at the 0.05 level*

Pairwise comparisons were conducted in order to identify which among the three groups; No/ Mild symptoms, moderate symptoms or severe symptoms, was driving the difference in Neuroticism, Anxiety and Stress, and the Bonferroni correction was used to adjust the significance values.

Figure 4: Box plot indicating neuroticism across levels of severity of premenstrual symptoms

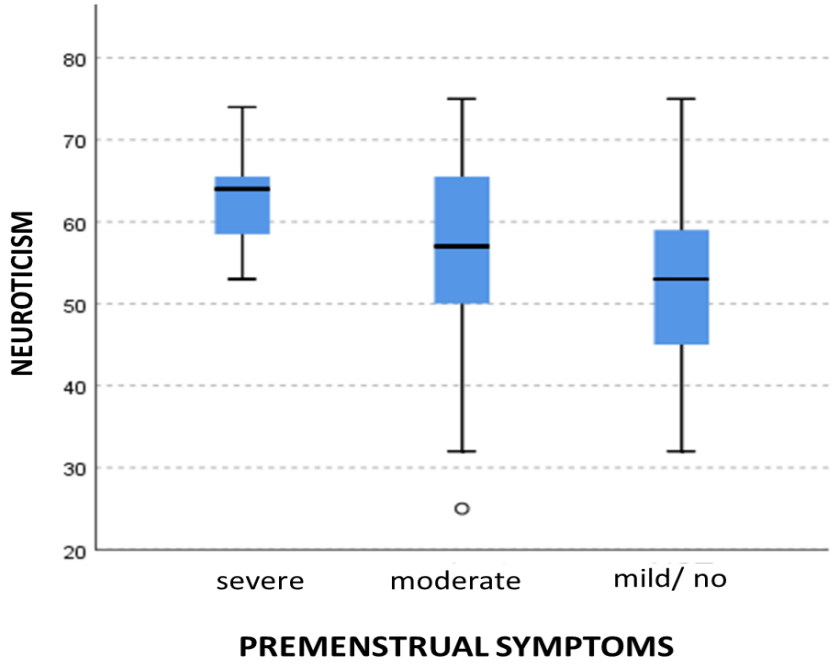


Figure 5: Box plot indicating anxiety across levels of severity of premenstrual symptoms

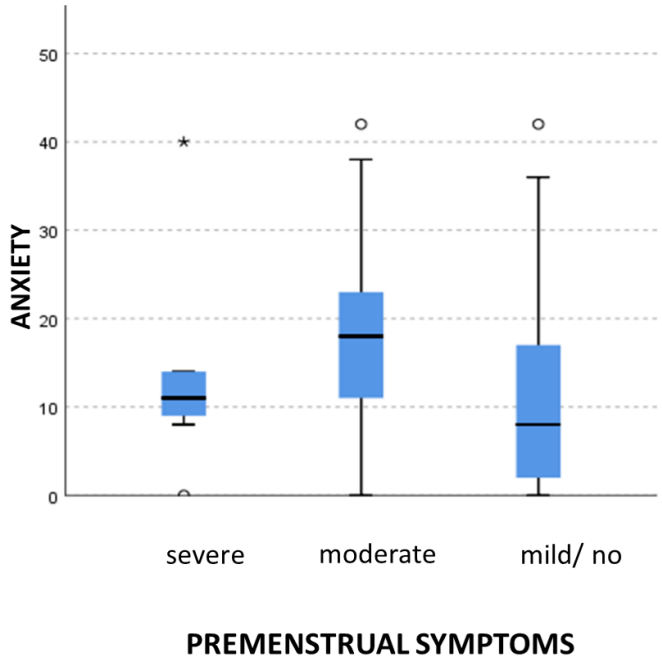
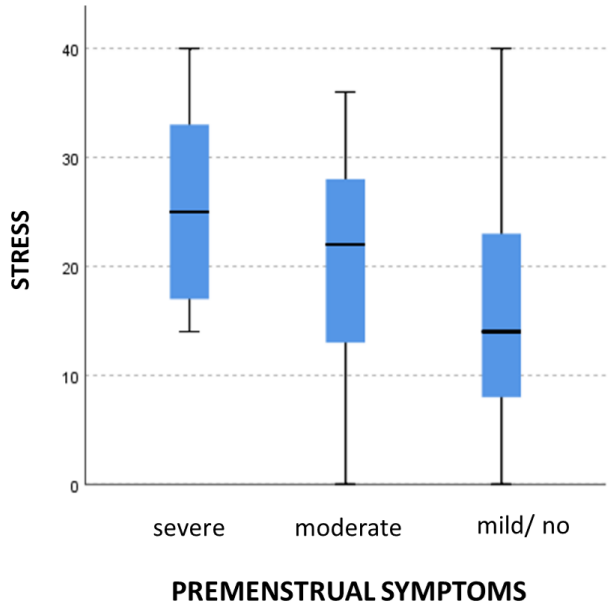


Figure 6: Box plot indicating stress across levels of severity of premenstrual symptoms



As indicated in figure 4, the PMDD group had a significantly higher level of neuroticism compared to the No to Mild symptoms group, F(2) = 32.292, p= .021. Across varied study designs; those that assessed association [15], studied risk for PMS [39], and those that used a comparative control group [37], similar results with regard to neuroticism, comprising of psychic trait anxiety, somatic trait anxiety, embitterment, stress susceptibility, and mistrust, have been obtained. As indicated in figure 5, the PMS group had a significantly higher level of anxiety, compared to the No/Mild symptoms group, F (2) = 20.538, p= .009. Faramarzi et al. (2014) identified that the risk for PMS was higher in women with an increased level of anxiety symptoms [39]. A clinical diagnosis of panic and generalized anxiety disorder is also found to be significantly higher in women with PMDD [37]. In the current study, the PMDD

group had a significantly higher level of stress, compared to the No/Mild symptoms group, F (2) = 28.646, p= .050. Recent Indian studies [7] identified that higher perceived stress was significantly associated with PMS. Tschudin et al. (2010) in their study on the prevalence and predictors of PMS and PMDD found significant evidence for general psychological distress to be associated with PMDD [40].

Overall, the current study highlights a significant relationship between a high level of conscientiousness and severe premenstrual symptoms, and also identified increased levels of Neuroticism in the PMDD group. A significant positive relationship was also found between depression and the severity of premenstrual symptoms, and a significant difference was found in anxiety and stress levels in the PMS and PMDD groups.

A culturally relevant understanding of the identified results is essential for interpretation. As per the National Mental Health survey [41], the prevalence of common mental disorders in women is approximately 6%. The rates of PMDD (7%) and PMS (26%) identified in the current study are also relevant in this regard. Gender-related stress and trauma, such as menstruation, intimate partner violence, discrimination, abuse, and inconsistent opportunities create distinctive vulnerabilities for women. Traditional gender roles designate a woman as the caregiver within families and social groups while normalizing her own self-neglect. With the progressing emancipation of women, another evolving concern is the burden of having to manage traditional roles, along with contemporary advances in education and employment. Thus, women's mental health carries a unique socio-cultural dimension [42].

Given such unique gender-related experiences, apart from cognitive behavioral and mindfulness therapies [43], culturally sensitive psychoeducation, along with a feminist approach to attachment-based, trauma-informed, or compassion-focused psychotherapy may be particularly beneficial to address premenstrual concerns.

These findings falsify lay misconceptions that premenstrual symptoms are an isolated phenomenon that requires women's tolerance and not treatment. The multitude of factors associated with PMS, such as pervasive personality, baseline psychological distress, and level of coping strength, reiterate that PMS is a unique manifestation of continuing and chronic challenges for women that require a broader formulation lens. These findings also suggest the need to assess comorbid psychological conditions in women with PMS to avoid diagnostic omission, and to routinely screen for PMS in women presenting to treatment for other mental illnesses. Given the relatively high prevalence of PMS in the general population, premenstrual exacerbation of existing mental health concerns must also be considered.

As proposed by the United Nations sustainable goals for women, improving access to health care and reproductive information is vital to enhance the status of women and promote gender equality as a human right. In the Indian context, where stigma about menstruation is widely prevalent and public discussions about the same are rare, studies focused on the same encourage dialogue, awareness and hold implications for healthcare advancement.

CONCLUSION

Significant associations were identified between trait conscientiousness, depressive symptoms, and premenstrual symptoms, as well as, significant differences were identified

between the groups on trait neuroticism and levels of anxiety and stress. The study also possesses limitations. The relatively small sample size, of Indian women from middle socioeconomic status limits the generalizability of the results. Retrospective responses provided by the participants could be subject to biases in recall. Future studies addressing clinical groups would benefit from using standardized diagnostic tools to assess PMS.

The study holds important theoretical implications for the conceptualization of the condition, as the identified predisposing and protective mechanisms may be critical contributions to the clinical picture of premenstrual conditions. The findings also suggest the need for holistic psychotherapeutic interventions; primary prevention and individual/group therapy for young and older menstruating women, wherein not only the premenstrual symptoms but also personality vulnerabilities, psychological distress and coping are addressed.

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Conflict of Interest
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