

## The relationship between personality characteristic and premenstrual syndrome among medical student faculty of medicine UNAIR batch 2022

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### Abstract

Premenstrual Syndrome (PMS) is a widespread condition affecting women, marked by a combination of psychological, behavioral, and physical symptoms that typically occur in the luteal phase of the menstrual cycle. These symptoms can significantly disrupt daily life, including academic performance and overall well-being. The intensity of PMS symptoms may be influenced by several factors, one of which is personality. This study explores the relationship between personality traits, particularly those identified in the Big Five model, and the severity of PMS symptoms among female medical students at Universitas Airlangga. This research utilized a correlational analytic design with a cross-sectional approach. The study sample comprised 91 female medical students from the 2022 cohort at Universitas Airlangga, selected using consecutive sampling. Data were collected through two questionnaires: the Premenstrual Syndrome Questionnaire (PSQ) to assess PMS severity, and the IPIP BFM-25 to measure personality traits based on the Big Five Personality Model. Spearman's rank-order correlation was used to analyze the relationship between personality traits and PMS severity. 96% of participants reported PMS symptoms, with 51% experiencing moderate, 37% mild, and 8% severe symptoms. A significant positive correlation was found between neuroticism ( $r = 0.469$ ,  $p < 0.001$ ) and PMS severity, suggesting that higher emotional instability correlates with more severe PMS symptoms. A weak but significant correlation was also found between openness to experience and PMS severity ( $r = 0.256$ ,  $p = 0.014$ ). No significant relationships were observed between PMS severity and other personality traits such as conscientiousness, extraversion, and agreeableness. The study highlights that emotional traits, particularly neuroticism and openness to experience, play a significant role in PMS severity. Female medical students exhibiting higher neuroticism and openness are more likely to experience more intense PMS symptoms, emphasizing the importance of addressing emotional health and developing interventions for emotional regulation to mitigate PMS effects.

**Keywords:** Premenstrual Syndrome; Personality traits; Neuroticism; Openness to experience; Medical students; Big Five Personality Model

### 1. Introduction

Premenstrual syndrome (PMS) is a prevalent medical issue that affects many women, marked by a combination of behavioral, psychological, and physical symptoms that typically emerge during the luteal phase of the menstrual cycle and subside just before menstruation. PMS can profoundly impact a person's quality of life, affecting daily performance and concentration, especially in settings like work and school (1). Symptoms commonly associated with PMS include breast tenderness, bloating, acne breakouts, and emotional disturbances such as frequent anger or feelings of sadness

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in the days leading up to menstruation (2). Although the exact cause of PMS remains unclear, it is believed to be connected to hormonal changes during the menstrual cycle, particularly imbalances involving estrogen and progesterone. Moreover, fluctuations in specific neurotransmitters such as serotonin, GABA, opioids, and catecholamines, along with genetic and age-related factors, are thought to contribute to the onset and severity of PMS symptoms (3).

Globally, the prevalence of PMS in women of reproductive age is approximately 47.8%, with variation across different regions and populations. In Ethiopia, PMS is reported to affect 53% of women (1), while studies in Turkey have shown that 66% of married women, 50.3% of high school students, and 59% of university students experience PMS (4). In Indonesia, a study supported by the World Health Organization found that 23% of teenagers experience symptoms of PMS (5). Evidence suggests that women with PMS and its more severe form, premenstrual dysphoric disorder (PMDD), exhibit higher suicide rates compared to the general population, highlighting the potential psychological and emotional toll of the condition (6). PMS negatively affects women's health-related quality of life, making daily activities more difficult and, in some cases, impeding economic and societal development due to decreased productivity (1). These significant effects also increase the risk of suicidal thoughts and actions, especially in severe cases. This underscores the importance of recognizing PMS not only as a physical health issue but also as a critical mental health concern that warrants serious attention from medical professionals.

Despite the widespread impact of PMS, there remains a significant gap in knowledge regarding its causes and effective coping strategies, particularly in relation to personality traits. Many women, including university students, face reduced productivity and a diminished quality of life due to PMS, but insufficient information is available about the underlying causes of the condition and how to manage it effectively (7). Medical students, in particular, may experience PMS more frequently than those in other disciplines due to the high social demands and the need for intense concentration in their studies. The stressors and lifestyle factors inherent to medical school could further influence the variation in PMS symptoms within this population (8). Medical students may be more prone to severe PMS compared to students from other faculties because of their higher academic workloads, as well as personality traits such as neuroticism (9). The high prevalence of PMS among medical students, particularly during the stressful phases of their education, should serve as a significant warning for policymakers in medical education to take these symptoms seriously. Recognizing PMS early on can help alleviate some of the burden associated with this health issue, potentially improving academic performance and overall well-being.

Personality traits have been identified as a potential factor influencing the severity of PMS symptoms in women. Personality refers to the unique patterns of thoughts, behaviors, and emotional responses that characterize an individual and influence how they adapt to and interact with their environment. These traits play a crucial role in how individuals respond to stressors, including those related to PMS. Several studies have explored the link between personality traits and PMS, yet the findings have been inconclusive, with some studies suggesting a connection between certain traits, such as neuroticism, and more severe PMS symptoms (10). Personality traits, such as high neuroticism, may predispose individuals to experience heightened emotional responses, potentially increasing the severity of PMS symptoms. However, the relationship between personality and PMS remains ambiguous, and there is a need for further research to clarify the role of personality traits in the development and severity of PMS symptoms.

Given the high prevalence of PMS among female medical students and its significant impact on their academic and personal lives, it is essential to conduct research into the personality aspects of PMS. Medical students play a critical role in society and must be able to manage their academic and personal responsibilities effectively. However, PMS can be a significant barrier to achieving these goals, particularly for students who are more prone to severe symptoms due to personality traits such as neuroticism. Therefore, investigating the relationship between personality characteristics and PMS is essential for developing effective interventions that can help students better manage their symptoms and improve their overall quality of life. The need for scientific studies that address the role of personality in PMS is especially important, as it can contribute to better understanding and more effective coping strategies for women facing this challenging condition. Furthermore, understanding how personality traits influence PMS could lead to the development of personalized interventions, which could be tailored to the specific needs of individual students.

In conclusion, this research aims to investigate the relationship between personality characteristics and the severity of PMS symptoms among female medical students at Universitas Airlangga. The findings of this study will not only contribute to the existing body of knowledge on PMS but also offer practical insights into how personality traits may influence the severity of symptoms. This research could pave the way for developing targeted interventions that address the emotional and psychological aspects of PMS, thereby improving the health and well-being of medical students and enabling them to perform at their highest potential. Given the critical roles that medical students play in society and

their future careers, ensuring that they have the tools and resources to manage PMS effectively is essential for both their personal development and their ability to contribute meaningfully to the field of healthcare.

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## **2. Material and methods**

### **2.1. Type of Research and Study Design**

This study utilized an observational analytic research design with a cross-sectional approach. The observational analytic study is aimed at determining the relationship between variables (14). The cross-sectional design collects data at a single point in time, allowing the researcher to examine the association between variables within a specific population without the need for follow-up (15).

### **2.2. Population and Sample**

The subjects in this study are the female medical students of the Faculty of Medicine, Universitas Airlangga, batch 2022, who met the inclusion criteria. Female medical students from this cohort were consecutively recruited until the required sample size was fulfilled. The inclusion criteria for participation were: being a female medical student, willing to participate in the study, having experienced menstruation, and being part of the 2022 cohort of female medical students. The exclusion criteria involved female students who did not complete the questionnaire.

### **2.3. Sampling Technique**

The sample was obtained using a consecutive sampling technique. Female medical students from the Faculty of Medicine, Universitas Airlangga, who met the inclusion criteria, were recruited consecutively until the sample size was achieved.

### **2.4. Data Collection and Materials**

The data collection was carried out using the Big Five Personality Test (IPIP BFM-25) and the Premenstrual Syndrome Questionnaire (PSQ). The IPIP BFM-25 assesses personality traits and is based on five dimensions: openness, conscientiousness, extraversion, agreeableness, and neuroticism. The Indonesian version of the IPIP BFM-25 was adapted by (11), showing acceptable reliability and validity. PMS was measured using the PSQ, which includes 22 common symptoms (11 behavioral and 11 physical). Both questionnaires were used to collect data regarding personality traits and PMS symptoms.

### **2.5. Data Processing and Analysis**

Data processing involved several steps: editing, coding, entry, and tabulating. Initially, the data was edited to ensure it met the inclusion criteria. Valid responses were coded and entered into SPSS for analysis. A simple frequency distribution was created, and the data was processed using Spearman's rank correlation to assess the relationship between personality traits and PMS severity. A univariate analysis was conducted on each variable, and a bivariate analysis was performed to determine correlations. The Spearman rank test was used to assess the statistical significance of the relationship, with correlation coefficient values interpreted as follows: a value between 0.00 – 0.25 indicates a very weak relationship, 0.26 – 0.50 indicates a moderate relationship, 0.51 – 0.75 indicates a strong relationship, and 0.76 – 0.99 indicates a very strong relationship. Statistical significance was determined by the p-value, with values less than 0.05 considered significant.

### **2.6. Ethical Considerations**

This study was conducted following ethical guidelines for research involving human participants. Ethical approval was obtained from the Medical Education Program at Universitas Airlangga under clearance number 120/EC/KEPK/FKUA/2024. Informed consent was provided to participants, explaining the study's purpose and ensuring their voluntary participation. The confidentiality of the participants was maintained by using initials instead of full names in the data processing and analysis.

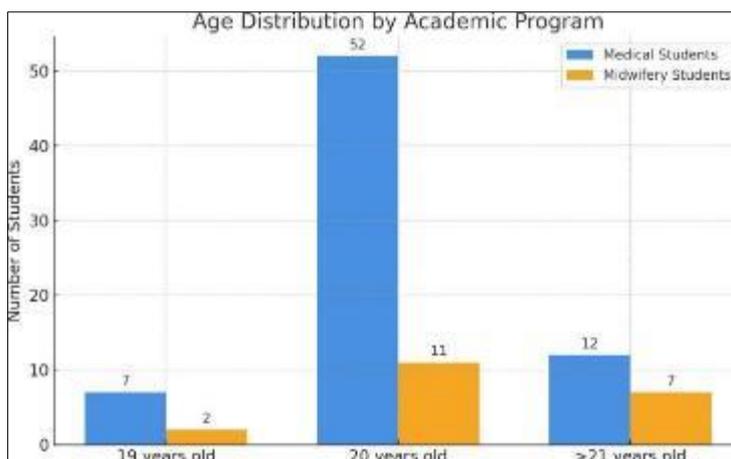
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## **3. Results**

### **3.1. Demographic Characteristic**

This study involved 91 medical students from batch 2022 academic at Universitas Airlangga who met the inclusion criteria. All participants had experienced menstruation, signed informed consent, and voluntarily completed the

questionnaire in full. The questionnaire was distributed to approximately 150 students from both the Medical and Midwifery programs. From this total, 91 students consented and submitted valid responses, making them eligible for inclusion in the final analysis. This study involved a total of 91 participants, consisting of 71 students from the Medicine program and 20 students from the Midwifery program.



**Figure 1** Demographic characteristics

Based on overall age distribution, 9 students (10%) were 19 years old, 63 students (69%) were 20 years old, and 19 students (21%) were over 21 years old. The average age of participants was predominantly 20 years. When categorized by academic program. Medical students were mostly 20 years old, comprising the majority of the total 63 students in that age group. The proportions of students aged 19 and over 21 were smaller in comparison. Midwifery students showed a similar pattern, with 22% aged 20 years, 11% aged 19 years, and 26% over 21 years. Overall, the 20-year-old age group was the most dominant across both programs, reflecting the typical academic age progression of the 2022 student cohort at Universitas Airlangga.

**3.2. Data analysis of Big Five Personality Traits**

Openness to Experience had scores ranging from 11 to 22, with a median of 15, mean of 15.7, and a standard deviation of 2.16, indicating low variability and similar levels of openness across participants. Conscientiousness ranged from 9 to 25, with a median of 19, mean of 18.2, and a standard deviation of 2.90, suggesting moderate variation in organization and responsibility. Extraversion showed a range of 11 to 20, with a median of 17, mean of 16.3, and a standard deviation of 1.85, reflecting consistency. Agreeableness ranged from 14 to 25, with a median of 20, mean of 20, and a standard deviation of 2.48. Neuroticism had the widest range (6 to 25), with a median of 18, mean of 17.6, and a high standard deviation of 3.99, indicating high variability in emotional stability.

**Table 1** Data analysis of Big Five Personality Traits

Variable	(N)	Min	Max	Median	Mean	Std.Deviation
Openess	91	11	22	15	15.7	2.16
Constiousness	91	9	25	19	18.2	2.9
Extraversion	91	11	20	17	16.3	1.85
Agreeableness	91	14	25	20	20	2.48
Neuroticism	91	6	25	18	17.6	3.99

**3.3. Description of Big five personality traits**

Since the data is not normally distributed the classification of the table distribution of participants based on the categorization of each Big Five personality trait into "High" and "Low" scorer. The categorization is based on the median values for each trait. Individuals categorized as "High" are those whose scores are above the median, while those in the "Low" category have scores below the median.

**Table 2** Description of big five personality traits

Variable	Category	Frequency	(%)
Openness	High	66	73
	Low	25	27
Conscientiousness	High	50	55
	Low	41	45
Extraversion	High	47	52
	Low	44	48
Agreeableness	High	55	60
	Low	36	40
Neuroticism	High	50	55
	Low	41	45

In the Openness to Experience category, 66 respondents were classified as highly open, indicating creativity and curiosity, while 25 showed low openness, favoring familiarity and conventional thinking. For Conscientiousness, 50 respondents demonstrated high conscientiousness, suggesting responsibility and organization, while 41 had low conscientiousness, reflecting spontaneity and less attention to detail. In Extraversion, 47 respondents were highly extraverted, enjoying social interaction, while 44 were introverted, preferring solitude. Agreeableness saw 55 respondents exhibiting warmth and cooperation, whereas 36 were less agreeable, being more competitive and skeptical. Finally, Neuroticism showed 50 high scorers, indicating emotional instability, while 41 displayed low neuroticism, showing emotional stability.

### 3.4. Distribution of Premenstrual Syndrome Frequency

The table presents below the distribution of Premenstrual Syndrome among the study participants, out of 91 respondents, Premenstrual Syndrome (PMS) was found to be highly prevalent among the 89 respondents with the only 2 respondents having no pms. Interestingly, 96% of participants reporting PMS symptoms. From these 91 respondents The largest proportion 51% experienced moderate symptoms, followed by 37% with mild symptoms, 8% with severe symptoms, and only 2% reporting no symptoms at all.

**Table 3** Distribution of Premenstrual Syndrome Frequency

Category	Frequency	Percentage (%)
No Premenstrual Syndrome	2	2
Mild	34	37
Moderate	47	51
Severe	8	8
Total	91	100

Those with mild symptoms (n=34) experienced minor issues, such as slight mood shifts or abdominal discomfort, with minimal disruption to their routine activities. Given the demanding academic and clinical environment of medical and midwifery students, these findings highlight the need for greater awareness and support regarding PMS, especially in cases where symptoms impair academic engagement and psychological well-being. Moderate PMS symptoms (n=47) were described as noticeable but tolerable, such as irritability, bloating, and low motivation, which could still reduce their ability to concentrate and perform optimally. Students with severe PMS (n= 8) reported considerable interference in daily functioning, including intense mood changes, fatigue, and physical discomfort, which negatively impacted their academic focus and clinical duties.

### 3.5. The Personality Characteristics and PMS

The normality tests indicated that both the Big Five Personality traits and Premenstrual Syndrome (PMS) scores were not normally distributed. Therefore, the Spearman's rho correlation test was selected to examine the relationship between personality characteristics and PMS severity.

**Table 4** Personality Characteristics and PMS

Variable	PMS	
	Spearman's rho	Sig.(2-Tailed)
Openness	0.256	0.014*
Conscientiousness	- 0.041	0.702
Extraversion	0.157	0.138
Agreeableness	0.166	0.116
Neuroticism	0.469	<0.001*

In this analysis found that Openness to Experience ( $p = 0.014$ ,  $r = 0.256$ ) and Neuroticism ( $p < 0.001$ ,  $r = 0.486$ ) were significantly correlated with Premenstrual Symptoms. These findings indicate that individuals with higher scores in openness and neuroticism tend to experience more severe PMS symptoms. Meanwhile, Conscientiousness showed no significant correlation with PMS ( $r = -0.041$ ,  $p = 0.702$ ), which means that both highly organized individuals (high conscientiousness) and more spontaneous individuals (low conscientiousness) can equally experience PMS. Similarly, Extraversion ( $r = 0.157$ ,  $p = 0.138$ ) also had no significant correlation, suggesting that both outgoing individuals (high extraversion) and more reserved individuals (low extraversion) may experience PMS symptoms to a similar extent. The same applies to Agreeableness ( $r = 0.166$ ,  $p = 0.116$ ), indicating that both cooperative, empathetic individuals (high agreeableness) and those who are more competitive or skeptical (low agreeableness) can equally report PMS symptoms.

### 3.6. Clinical Consideration and Early Awareness of Potential Underlying Disorders

Several participants in this study reported experiencing severe PMS symptoms that prompted them to seek medical or psychiatric consultations. Although the focus of this research lies in the association between personality traits and PMS severity, the notable distress experienced by certain individuals suggests that some symptoms may have crossed the threshold from physiological variation into the realm of pathology. Specifically, extreme cramping, mood disturbances, and social impairment may be indicative of underlying gynecological or hormonal conditions, such as Polycystic Ovary Syndrome (PCOS) or Premenstrual Dysphoric Disorder (PMDD). While this study did not include clinical diagnostic evaluation, the findings raise the need for greater awareness regarding when PMS-related symptoms should be considered a signal for further medical assessment. It is therefore recommended that future research include a clinical screening component to help distinguish between typical PMS patterns and more severe or chronic conditions. Additionally, students and academic institutions should be informed that PMS, particularly in its severe forms, may not merely be a discomfort to be endured but potentially a symptom of diagnosable and treatable disorders. Early awareness and access to professional support are crucial in preventing long-term impacts on mental and reproductive health.

## 4. Discussion

This study aimed to explore the relationship between personality characteristics and Premenstrual Syndrome (PMS) among female medical students from the 2022 batch at Universitas Airlangga. To collect primary data, two questionnaires were employed: the Premenstrual Syndrome Questionnaire (PSQ) and the Big Five Personality Traits questionnaire. A total of 91 female medical students who met the inclusion criteria participated in the study. The findings revealed a wide range of PMS severity among the participants, with most experiencing mild to moderate symptoms. Spearman's rank-order correlation analysis was used to examine the relationship between personality traits and PMS severity, providing interesting insights into how different personality traits might influence PMS experiences among medical students. This study involved 91 female medical students, primarily from the Medicine program at the Faculty of Medicine, Universitas Airlangga. Of the approximately 150 students invited from the Medicine and Midwifery programs, 91 completed the questionnaires and were included in the final analysis. Among these, 71 students were from the Medicine program, and 20 were from the Midwifery program. In terms of age, the majority of the participants

were 20 years old (69%), with 10% being 19 years old, and 21% over 21 years old. This age distribution aligns with the academic progression of the 2022 cohort, with most students being in the typical age range for their academic year. Both Medicine and Midwifery students followed a similar age pattern, with 20 years being the most common age among participants. All participants had experienced menstruation, completed the informed consent process, and voluntarily participated in the study, providing valuable data for analysis.

The correlation between Openness to Experience and PMS severity revealed a weak but statistically significant positive relationship ( $r = 0.256$ ,  $p = 0.014$ ). Openness to Experience, which encompasses traits such as imagination, curiosity, and a heightened sensitivity to internal experiences, may explain why individuals who score high in this trait tend to notice and report PMS symptoms more readily. These individuals are more self-aware and emotionally sensitive, which could make them more likely to perceive and reflect on symptoms, intensifying their experience of PMS even if the physical symptoms are not necessarily more severe. This finding supports previous research that linked high Openness with increased sensitivity to emotional and physical discomforts, including PMS (Dehghan, Kaboudi, and Rezaie Khosravi, 2020b). While the correlation between Openness and PMS severity was weak, it offers an intriguing avenue for further research. Future studies could investigate how emotional intelligence, mindfulness, or cognitive appraisal processes may amplify the awareness of PMS symptoms in individuals with higher Openness. On the other hand, no significant correlations were found between PMS severity and the other personality traits: Conscientiousness, Extraversion, and Agreeableness. This aligns with previous studies, such as those by Arslantaş, Abacigil, and Çinakli (2018), who also found no significant relationships between these traits and PMS symptoms among university students. Conscientiousness, typically associated with traits like responsibility, organization, and self-discipline, was hypothesized to correlate with better coping mechanisms for PMS, possibly resulting in less severe symptoms. However, the study did not find such a correlation, suggesting that while conscientiousness might aid in task management and goal-setting, it does not necessarily influence the emotional and physical symptoms related to PMS. Similarly, Extraversion, which is characterized by sociability, assertiveness, and a positive emotional outlook, did not show a significant correlation with PMS severity. While extraverts are generally more resilient and report higher subjective well-being, the hormonal and physiological changes during the premenstrual phase may override any personality-driven resilience, neutralizing the potential protective effects of extraversion. Likewise, Agreeableness, which involves traits like trust, empathy, and cooperation, also did not correlate with PMS severity. While agreeable individuals may enjoy better social support and interpersonal relationships, these factors did not seem to significantly influence the internal experience of PMS symptoms, suggesting that social harmony traits alone are not sufficient to mitigate the impact of PMS.

The strongest correlation was found between Neuroticism and PMS severity. Neuroticism, characterized by emotional instability, anxiety, and heightened stress sensitivity, was moderately and positively correlated with PMS severity ( $r = 0.469$ ,  $p < 0.001$ ). This finding corroborates previous studies that have shown that individuals with higher levels of neuroticism are more likely to experience severe PMS symptoms due to their heightened emotional reactivity to hormonal fluctuations during the menstrual cycle (Hamidovic et al., 2022). People high in neuroticism are more likely to experience mood swings, irritability, and anxiety, all of which can amplify both the emotional and physical discomforts typically associated with PMS. The emotional instability seen in individuals with high neuroticism likely exacerbates the subjective experience of PMS symptoms. These findings align with research by Maruli Tua Silaen (2023), which also found that emotional instability related to neuroticism intensifies PMS experiences. The results support the hypothesis that neuroticism plays a significant role in determining PMS severity, emphasizing the importance of emotional regulation strategies as a potential intervention for those experiencing more severe PMS symptoms. This finding is consistent with other studies, including those by Sahraian et al. (2018), which showed that neuroticism significantly predicts PMS intensity. As neuroticism is associated with heightened emotional reactivity and vulnerability to stress, interventions targeting emotional regulation may be beneficial for managing PMS, especially in individuals with high neuroticism.

Despite the valuable insights gained, the study faced several challenges and limitations. One limitation was the use of self-reported questionnaires administered via Google Forms, which may have introduced response biases, such as social desirability bias or inaccurate self-perception. Participants might have underreported or overreported their PMS symptoms or personality traits, potentially affecting the reliability of the data. Additionally, the study sample was limited to female medical students from a single academic institution and a single year cohort (2022 batch). While this provided a homogeneous group for analysis, it limits the generalizability of the findings to other populations, including students from different academic disciplines, universities, or age groups. The study also faced limited time for data collection due to the tight academic calendar and upcoming examinations, which reduced opportunities for follow-up or broader participation. Furthermore, recruiting participants who were willing to complete the questionnaire posed another challenge. Managing the online survey distribution and ensuring all responses were complete, valid, and usable for statistical analysis was also difficult, highlighting the challenges of conducting research in an online environment.

The study provided valuable insights into the relationship between personality traits and PMS severity among female medical students. It highlighted the significant role of neuroticism in the severity of PMS symptoms, while also suggesting that other personality traits, such as Openness, may have a weaker but still notable influence on the experience of PMS. The lack of significant correlations between PMS and traits like Conscientiousness, Extraversion, and Agreeableness suggests that these traits may not directly impact PMS severity. These findings emphasize the need for further research to explore the complex interplay between personality and PMS and to investigate potential interventions for those most affected by severe symptoms, particularly individuals high in neuroticism.

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## 5. Conclusion

This study explored the relationship between personality traits and PMS severity among female medical students from the 2022 cohort at Universitas Airlangga. The findings indicated that most participants experienced mild to moderate PMS symptoms. Notably, Neuroticism was positively correlated with PMS severity, showing that individuals with higher emotional instability were more likely to experience intense PMS symptoms. Openness to Experience also had a weak but significant positive correlation with PMS severity, suggesting that individuals more sensitive to emotions and open to new experiences may perceive PMS symptoms more intensely. However, no significant correlations were found with Conscientiousness, Extraversion, or Agreeableness. The study highlights the importance of emotional traits, particularly Neuroticism and Openness, in understanding PMS severity. Future research should incorporate objective physiological assessments, such as hormonal levels, and include a broader and more diverse sample population. Educational initiatives focused on menstrual health and emotional coping strategies are recommended to help students better manage PMS and improve their overall well-being.

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## Compliance with ethical standards

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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