Prevalence of premenstrual syndrome among students – Stress a potential risk factor

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ABSTRACT

Background: Premenstrual syndrome (PMS) is a group of symptoms that occur prior to menstruation and disappear with its onset. This study aims to determine the prevalence and possible risk factors of PMS among the medical students.

Methods: We conducted a cross sectional survey which includes 450 female health professional undergraduate and postgraduate students between the age group of 18–35 years. A self-administered questionnaire for PMS and self-rating stress (perceived stress scale-PSS) was used to evaluate the prevalence and severity of the PMS.

Results: The prevalence of PMS among the student was 76.35%. Prevalence of PMS was significantly higher among the participants of age group 18–21 years, hostellers, participants who reported irregular physical activity and participants with high stress levels. The most common psychological symptom of PMS reported was reduced social interaction, followed by irritability while the most common somatic symptoms were aches and pains - muscle pain followed by abdominal bloating. PSS levels were significantly higher in females with PMS as compared to females without PMS.

Conclusion: This study suggests that stress is a potential risk factor in increasing the incidence of PMS among young girls. PMS can impact the academic performance and decrease quality of life of students. Thus, interventions such as yoga and mind relaxing techniques should be adopted to minimize stress levels and thus improve the quality of life among young females who experience PMS.

1. Introduction

Premenstrual syndrome (PMS) is a condition that affects many women of reproductive age. It refers to a collection of physical and emotional symptoms that typically occur in a cyclic manner during the luteal phase of the menstrual cycle, which is the phase between ovulation and the onset of menstruation. The specific symptoms experienced can vary widely between individuals, but commonly reported physical symptoms of PMS include breast tenderness, bloating, fatigue, headaches, and changes in appetite. Emotional and psychological symptoms may include mood swings, irritability, anxiety, depression, and difficulty concentrating. The exact cause of PMS is not fully understood, but hormonal fluctuations during the menstrual cycle are thought to play a significant role. Specifically, the changing levels of estrogen and progesterone, as well as alterations in brain chemicals such as serotonin, are believed to contribute to the development of PMS symptoms. Stress can have a significant impact on the severity and frequency of PMS symptoms. During stress, body releases stress hormones like cortisol, which can disrupt the delicate balance of other hormones involved in the menstrual cycle. This hormonal imbalance can exacerbate PMS symptoms or make them more challenging to manage. Additionally, stress can contribute to psychological symptoms associated with PMS, such as irritability, anxiety, and mood swings. The emotional strain of stress can amplify these symptoms, making them more intense and harder to cope with. Previous study demonstrated the prevalence of PMS in new female university students, and has observed the factors that contribute to...
Premenstrual syndrome (PMS), including poor sleep quality, psychological impairment, and nutritional/metabolic factors. PMS is not just a condition that decreases the quality of life but it is also a predisposing factor to the occurrence of many health conditions like Cancer, arthritis, stroke, Alzheimer’s, reproductive issues and can impair daily activities. The main concern regarding Premenstrual syndrome hovers around the appropriate diagnosis and treatment which allow women to maintain a proper work life balance. However there are very limited studies examining the association of Premenstrual syndrome and stress from Indian population. This study is proposed to determine the prevalence of stress by questioning their feelings and thoughts during the various somatic and psychological symptoms that the women face few cycles were excluded. Section 4 encompassed questions regarding the menstrual history of participants. The menstrual history of participants was obtained from Section 3 and those with irregular menstrual cycles were excluded. Participation was purely voluntary and that participants possessed the right to refuse participation, to withdraw from the study.

2. Methods
2.1. Permission from institutional ethics committee

This cross sectional study was initiated after obtaining permission from The Institutional Ethics Committee of host institution. Permission from the Dean of Medical College was obtained for the conduct of the study.

2.2. Selection of study participants

Undergraduate and postgraduate health professional students between the age group of 18–35 years during the academic year of 2016-17 were selected as participants for the study. Students with the history of amenorrhea, use of oral contraceptive pills, pelvic inflammatory disease, endometriosis, metabolic disorders, thyroid disorders, and under any steroid therapy were excluded. Participation was purely voluntary and that participants possessed the right to refuse participation, to withdraw from the study.

2.3. Data collection tools

2.3.1. Assessment of premenstrual syndrome

The data collection tool used in this study was a self-administered PMS data collection form and Perceived Stress Scale questionnaire. The PMS data collection form had 4 sections. Section 1 was based on the demographic information of the participant. Section 2 consisted of questions to identify co-morbidities. The menstrual history of participants was obtained from Section 3 and those with irregular menstrual cycles were excluded. Section 4 encompassed questions regarding the various somatic and psychological symptoms that the women face few days prior to menstruation which was prepared keeping in mind the criteria proposed by the American College of Obstetrics and Gynecology (ACOG) in diagnosis of Premenstrual syndrome. A question on impairment of daily activities was introduced in this section to assess the severity of PMS. Section 5 had questions on the hobbies of participants and to understand the coping strategies used by them at the time of stressful situations. A 10 item perceived stress scale questionnaire was used to identify stress. This questionnaire aimed at understanding the stressful situations. A 10 item perceived stress scale questionnaire was used to identify stress. This questionnaire aimed at understanding the level of stress by questioning their feelings and thoughts during the month prior to the administration of the questionnaire. Score <13 was considered a low stress and a score >14 was considered as moderate - high stress.

2.4. Data collection procedure

Prior to administration of the PMS Data collection form and the questionnaire, informed consent was obtained from the participants. The structured questionnaire was given to each participant and about 15–20 min was given to fill in their responses.

2.5. Statistical analysis

Data entry and data cleaning was done. The data was analyzed using R statistical software version 3.6.3. Data is represented as mean and standard deviation for quantitative variables and frequency & proportion for categorical variables. Normality of the data set was done using Kolmogorov–Smirnov Z test. Independent sample t-test was used to test the statistical significance of the differences between the means. Chi square test was used to test the statistical significance between the proportions. Data is represented using appropriate tables & diagrams like pie chart and bar diagrams. P value < 0.05 is considered statistically significant.

3. Results

3.1. Description of study population

650 participants were initially screened. Based on the selection criteria, 200 were excluded due to presence of co-morbidities and unwillingness to participate in the study. 63 participants were eliminated due to lack of sufficient data and the final sample size taken for analysis was 389.

The age distribution, BMI and menarcheal age were similar between the two groups (297 participants with PMS and 92 normal participants) in the study population.

3.2. Prevalence of PMS

Fig. 1 shows the prevalence of PMS among the study population. The overall prevalence of Premenstrual syndrome was found to be 76% (see Fig. 2).

3.3. Age and PMS

Table 1 shows the comparison of stress and Premenstrual syndrome between the two age groups. Prevalence of Premenstrual syndrome, and Perceive stress scores were all higher among the younger age group, i.e. 18-25 years.

3.4. Stress and PMS

Overall prevalence of high Stress among the study population was 75%. PSS level in females with PMS was 19.5 ± 4.9. Percent prevalence of high stress was significantly increased in the group with PMS when compared to the normal group (Figure: 2).
3.5. PMS and risk factors

Table 2 provides the percent prevalence of PMS among several subcategories within the study population. Prevalence of PMS was significantly higher among the participants of age group 18–21 years, hostellers, participants who reported irregular physical activity and those with high stress levels. Although the difference in prevalence of PMS across other subcategories such as diet, nutritional status, consumption of coffee and coping mechanism were not statistically significant, the differential prevalence across select subcategories has been described to illustrate potential contributions from risks related to PMS. The study sample lacked adequate power to detect statistically significant differences for all the risk factors.

3.6. Somatic and Psychological Symptoms of PMS

The most common psychological symptom of PMS reported was reduced social interaction, followed by irritability experienced by 80.83% (n = 253) and 66.13% (n = 207) of the participants respectively while the most common somatic symptom reported was aches and pains predominately muscle pain followed by abdominal bloating, experienced by 49.20% (n = 154) and 42.49% (n = 133) respectively (Table: 2).

3.7. PMS and coping mechanism

86.88% (n = 338) of the study participants had a hobby and 58.28% (n = 197) of them practiced it regularly (>3 days a week). 55.62% (n = 188) participants used their hobbies as a coping mechanism from PMS and 58.28% (n = 197) perceived relief from the symptoms on practicing their hobby as a coping mechanism (Table: 2).

4. Discussion

The present study revealed that the overall prevalence of PMS was found to be 76% and associated with a high prevalence of perceived stress. Estimating the prevalence of PMS can be challenging due to variations in study methodologies, diagnostic criteria, and cultural factors. However, it is generally accepted that a significant number of women experience some form of PMS symptoms during their reproductive years. Studies have reported a wide range of prevalence rates for PMS. Some studies suggest that about 75–80% of menstruating women may experience at least one symptom of PMS, while approximately 20–40% may experience moderate to severe symptoms that significantly impact their daily lives. It’s important to note that the severity and impact of PMS symptoms can vary. For some individuals, symptoms may be mild and manageable, while for others, they can be more severe and disruptive.

Stress has been recognized as a potential contributing factor to the development and exacerbation of PMS symptoms. Psychological and emotional stress can influence hormonal fluctuations, neurotransmitter levels, and overall physiological functioning, which can in turn impact PMS symptoms. Stress can affect the hypothalamic-pituitary-adrenal
those involved in the menstrual cycle. Furthermore, stress can also worsen psychological symptoms associated with PMS, such as mood swings, irritability, and anxiety. The relationship between stress and PMS is complex and multifaceted, with stress both contributing to and being influenced by PMS symptoms. It’s important to note that studies examining the relationship between stress and PMS have reported varying findings, and the specific mechanisms by which stress affects PMS symptoms are still being explored. Additionally, cultural and contextual factors can influence the prevalence and impact of PMS, which may explain differences in reported rates across different regions and populations. To fully understand the relationship between stress and PMS, it is important to consider multiple factors, including individual differences, psychosocial factors, and potential confounding variables. Further research is needed to explore the specific mechanisms underlying the relationship between stress and PMS and to develop effective interventions and management strategies.

4.1. Limitations

The use of a self – reported questionnaire helps in establishing an association, and not causation. Though the use of a questionnaire can lead to some memory disparities in the recorded data, it is the only reliable method due to lack of specific markers for the identification and diagnosis of PMS which is multifactorial.

5. Conclusion

The prevalence of PMS obtained from this study is 76%, which is higher than studies reported in India. The current study suggests that stress can be a contributing factor in increasing the incidence of PMS among young girls. Thus, creating awareness and educating about the non-pharmacological therapy such as engaging in mind relaxing techniques like Yoga, music therapy, meditation can minimize stress levels and thereby reducing the severity of PMS symptoms and improving their quality of life.

Author contributions

Conceptualization, methodology/design, investigations – R.P; Acquiring Data and data curation- H.N and L.S; Writing original draft- H. N and M.K; Data analysis and interpretation-M.K; Reviewing and editing-R.P.; Revising the manuscript critically for important intellectual content-R.P.

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Ethical approval statement

Institutional Ethics Clearance was obtained from the host institution [Sri Ramachandra Medical College and Research Institute, SRIER (DU), Chennai, India) before recruiting the participants (ref: CSP/17/NOV/64/39, dated 18.12.2017).

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