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ORIGINAL ARTICLE

Impact of Pre-Menstrual Syndrome on Academic Performance of Undergraduates Medical Students

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ABSTRACT

Objective: This study aims to investigate the effect of PMS on the academic performance of undergraduate medical students.

Materials & Methods: The present study was cross sectional and analytical involving 49 undergraduate medical students. A structured proforma was used to gather information about the demographic characteristics, menstrual history, and body mass index (BMI), as well as information about the severity of premenstrual symptoms. The severity of premenstrual syndrome was determined by a premenstrual symptom score and the participants divided into lower and higher PMS severity groups. Students' academic performance was divided into good and poor performance groups. The data were analyzed statistically by using the methods similar to the Statistical Package for the Social Sciences (SPSS). Data were presented as mean ± standard deviation for continuous variables and frequencies and percentages for categorical variables. Where appropriate, the chi-square test was used and independent sample t-test was used, $p<0.05$ being statistically significant.

Results: The mean age of participants was 22.65 ± 1.52 years, while the mean BMI was 23.66 ± 2.03 kg/m². The mean age at menarche was 12.08 ± 1.09 years, and the overall mean PMS score was 26.22 ± 3.99. Of the participants 26 (53.1%) were classified into the lower group of severity of PMS and 23 (46.9%) were classified into the higher group of severity of PMS. The good academic performance was noted among 31 (63.3%) students while the poor academic performance was noted among 18 (36.7%) students. There was a statistically significant relationship between the level of severity of PMS and academic performance ($p<0.001$). Academically poor students scored significantly higher on the PMS than did good academic students (30.17 ± 2.76 vs 23.94 ± 2.31; $p<0.001$).

Conclusion: Undergraduate medical students are highly affected by PMS and suffer in their academic performance. The higher the level of severity of the PMS, the poorer the academic outcomes. Recognizing the importance of early identification, awareness initiatives, and suitable care and management practices, can lead to better learning outcomes and general health for students who are impacted.

Keywords: PMS; academic performance; medical students; menstrual health; and severity of PMS.

INTRODUCTION

Premenstrual syndrome (PMS) is a common clinical disorder that affects females of reproductive age and is defined by a constellation of symptoms physical, emotional, cognitive and behavioral in nature that occur in a cyclical pattern during the luteal phase of the menstrual cycle and are resolved soon after the onset of menstruation[1]. Symptoms may include mood swings, irritability, anxiety, depression, fatigue, bloating, breast tenderness, and difficulty concentrating. Although most women experience mild symptoms, a minority, probably 20 to 30% of women, experience moderate to severe symptoms that cause significant interference with normal functioning, and about 38 percent of women develop premenstrual dysphoric disorder (PMDD), a more severe and disabling type[2].

It is believed that the pathophysiology of PMS is complex and involves ovarian steroid hormones and neurotransmitter systems, especially serotonin[3]. The variations in estrogen and progesterone levels in the menstrual cycle can affect the central nervous system activity causing emotional and cognitive disorders. The severity and expression of the symptoms are also affected by the genetic predisposition, lifestyle factors, stress, and nutritional status[4].

PMS acquires special significance among undergraduate medical students because of the academic environment of high demands and stress[5]. Long hours of study, frequent exams, sleep deprivation and psychological stress are all linked to medical education and may worsen the symptoms of PMS. Academic success heavily depends on cognitive functions like attention, memory, decision-making, and problem-solving, and these areas are usually negatively impacted during the premenstrual phase. As a result, PMS can worsen the learning process, decrease classroom attendance, and have a detrimental effect on test scores[6].

Academic performance is a multifactorial outcome that is affected by intellectual ability, motivation, mental health, physical well-being and environmental factors. Menstrual health in female students is a largely ignored yet possibly important determinant. Although the awareness of women and their health has increased, PMS is still undiagnosed and undertreated especially in developing countries where cultural stigma and ignorance may prevent students to seek medical attention[7,8].

Past researches have been done on various populations that have demonstrated a negative relationship between PMS and academic productivity, indicating that there has been an increase in absenteeism, decreased concentration and low academic performance amongst the affected students. Nonetheless, there is a paucity of local data that examine this correlation among medical students who represent a special subgroup with high expectations of school performance and stress levels. This association is crucial to the development of specific interventions, such as counseling services, lifestyle changes, and strategies to manage them medically. Consequently, the current paper will assess the effect of premenstrual syndrome on academic performance among undergraduate medical students. By providing the level of impact PMS has on academic results, this study aims at making a contribution to the body of knowledge and emphasize the necessity to raise awareness and provide supportive actions within academic establishments.

MATERIALS & METHODS

A cross sectional analytical study was carried out on undergraduate medical students to find the effect of premenstrual syndrome (PMS) on academic performance. The study was conducted for six months from the ethical committee's approval from January 2023 to June 2023. All participants signed informed

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consent forms before data collection and confidentiality of personal information was kept throughout the study. The non-probability sampling technique was used and 49 female undergraduate medical students were included. Students who were of reproductive age, were post-menarche, and enrolled in medical program were included in the study. Known endocrine abnormalities, chronic systemic illnesses and students taking hormonal therapy were excluded to reduce confounding factors, as were students with known psychiatric disorders.

Structured proforma was prepared and data were collected with the help of the given data set. Demographic variables comprised age, body mass index (BMI), socioeconomic status and residential status (hostelite or day scholar). Age at menarche was the only variable in the menstrual history block. The severity of premenstrual syndrome was determined by a premenstrual symptom score (pre-score) to rate and quantify the level of premenstrual symptoms. Participants were assigned to either of two groups according to the distribution of scores: low and high severity level of PMS.

Academic performance was measured by the recorded academic scores from institutional records/self-report and divided into two categories: good performance and poor performance with cut-off points defined in advance. This classification facilitated comparisons of PMS severity groups.

Statistical Analysis: The data were analyzed using statistical techniques similar to the Statistical Package for the Social Sciences (SPSS). Continuous variables like age, BMI, age at menarche and PMS score were given as mean ± standard deviation (SD), and categorical variables like the PMS groups and academic performance categories were presented as frequencies and percentages. The chi-square test was used for inferential analysis to test the association between the severity of PMS and academic performance. P value<0.05 was deemed as statistically significant. The strength of association was interpreted using the effect size measures where appropriate.

RESULTS

A total of 49 undergraduate medical students were studied. The socio-demographic, anthropometric and menstrual parameters were examined along with the severity of premenstrual syndrome and its correlation with academic performance. The average age of the participants was 22.65 ± 1.52 years, and ranged from 20 to 26 years. The mean body mass index (BMI) was 23.66 ± 2.03 kg/m², while the mean age at menarche was 12.08 ± 1.09 years. The mean score of all premenstrual symptoms was 26.22 ± 3.99. Of the participants, 26 (53.1%) were in the lower severity group of the PMS and 23 (46.9%) in the higher severity group of the PMS. The result of academic performance assessment showed 31 students (63.3%) had good academic performance and 18 students (36.7%) had poor academic performance.

There was a further investigation of the relationship between severity of PMS and academic performance. Students who were more severely affected by PMS showed relatively poorer academic achievement compared to students who were less severely affected by PMS.

On the other hand, a statistically significant association was found between the clients' academic performance and the severity of PMS, meaning that the more severe the PMS of students, the more likely they were to struggle in academic performance. Subgroup analysis was conducted for continuous variables to compare the good and poor academic performance students.

Students with poor academic performance had significantly higher PMS scores and BMI values compared to students with good academic performance. Figure 1 shows that students who have greater severity of PMS exhibited significantly higher number of poor academic performance than students who have lesser severity of PMS. On the other hand, academic achievement was mainly found among pupils who had mild levels of PMS symptoms.

Table 1: Baseline Demographic and Clinical Characteristics of Participants (n=49)

Variable	Mean ± SD / n (%)
Age (years)	22.65 ± 1.52
BMI (kg/m²)	23.66 ± 2.03
Age at menarche (years)	12.08 ± 1.09
Premenstrual symptom score	26.22 ± 3.99
Lower PMS severity group	26 (53.1%)
Higher PMS severity group	23 (46.9%)
Good academic performance	31 (63.3%)
Poor academic performance	18 (36.7%)

Table 2: Association Between PMS Severity and Academic Performance

PMS Severity Group	Good Academic Performance n (%)	Poor Academic Performance n (%)	Total
Lower PMS severity	23 (88.5%)	3 (11.5%)	26
Higher PMS severity	8 (34.8%)	15 (65.2%)	23
Total	31 (63.3%)	18 (36.7%)	49

Chi-square test = 14.92
p-value <0.001

Table 3: Comparison of Clinical Variables According to Academic Performance

Variable	Good Academic Performance (n=31) Mean ± SD	Poor Academic Performance (n=18) Mean ± SD	p-value
Age (years)	22.41 ± 1.36	23.06 ± 1.71	0.182
BMI (kg/m²)	23.18 ± 1.88	24.49 ± 2.07	0.041
Age at menarche (years)	12.19 ± 1.01	11.89 ± 1.23	0.364
PMS score	23.94 ± 2.31	30.17 ± 2.76	<0.001

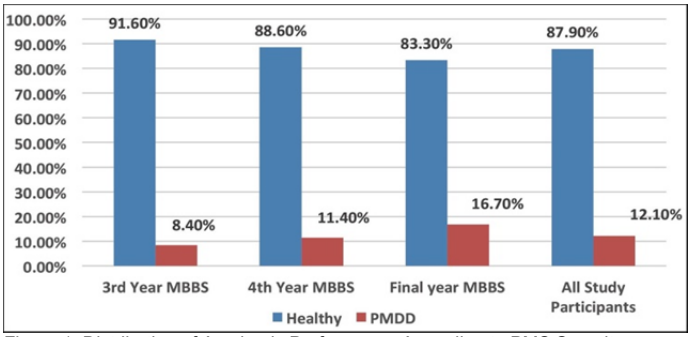

Figure 1: Distribution of Academic Performance According to PMS Severity.

DISCUSSION

The effect of premenstrual syndrome (PMS) on academic performance of the undergraduate medical students in the present study was found to be significant and increased severity of PMS was associated with the poor academic performance. After performing the analysis, students with higher PMS scores showed significantly poorer academic performance and functioning compared to students with lower PMS scores, indicating that menstrual health has a significant impact on academic performance and functional status of female medical students.

Premenstrual syndrome (PMS) is now known to have a multidimensional character, involving several physical, emotional, behavioural and cognitive areas. The symptoms of PMS such as fatigue, irritability, anxiety, mood instability, insomnia, abdominal discomfort, and loss of concentration can impact on academic activity and the learning process. Medical students are especially vulnerable due to the stress involved in medical education, extended hours of study, mental stress, competitive atmosphere, and limited time to sleep or engage in personal hygiene. These can make premenstrual symptoms worse and lead to poorer academic performance[9, 10].

The mean symptom burden of the participants in the current study was at a moderate level, based on the PMS score. Almost half of the students were in the higher group of PMS severity

indicating that it was highly prevalent among female medical undergraduates. The results are similar to those in earlier international and regional studies, which reported a high prevalence of PMS among university and medical students. Hormonal changes, stress in school, sleep disturbances, irregular feeding patterns and poor nutrition that are often seen in school-going girls could be responsible for the high prevalence seen in younger women[11].

The statistically significant correlation between the severity of the PMS and academic performance was one of the most significant results of this study. PMS scores had a significant association with poor academic outcomes: students who scored higher were quite likely to exhibit poor outcomes. This association might be due to the cognitive and psychological impact of PMS. Many women have poor attention spans, have short memory, poor concentration, and lack of motivation during the luteal phase of the menstrual cycle, which can adversely impact studying, attending lectures, preparation for examination and academic productivity. In addition, emotional symptoms like depression, irritability and anxiety can affect interpersonal relationship and ability to deal with academic stress well[12, 13].

This study's results coincide with the previous ones carried out with other university students in various countries. Several studies have cited that PMS causes absenteeism, decreased involvement in the classroom, poor performance in examinations, and lowered quality of life. Other studies among medical students have found that the severity of PMS is related to poorer grades and a lower level of educational satisfaction. The current study corroborates these observations and adds to the evidence of the negative academic consequences of PMS among undergraduate medical students[12-15].

Another interesting finding in this study was the relationship between the higher BMI and lower academic performance. Pupils' BMI was higher for those who achieved poor academic performance. The link between BMI and PMS is still not fully understood, but some previous studies indicate that overweight and obesity can contribute to hormonal imbalance, inflammatory reactions and psychological stress, which may lead to worsened PMS symptoms. Also, unhealthy lifestyle habits like insufficient exercise and unhealthy eating can be a factor contributing to both a higher BMI and a greater symptomology experienced with PMS. This highlights the significance of lifestyle changes as a potential approach to enhancing menstrual health and school performance[16].

In this study, age at menarche was not significantly related to academic performance. The results indicate that the severity of the current symptoms and continued menstrual experiences may be more important to academic functioning than the timing of menstruation. Likewise, no differences were found between the two age groups and this suggests that the impact of PMS on academic performance may be fairly constant over the course of the academic year[17].

The results of this research have significant educational and clinical implications. Early identification of medical students with severe PMS, coupled with counseling services and psychological support, use of stress management techniques and appropriate medical treatment may be beneficial. PMS should not be brushed aside as a minor inconvenience of physiology, but recognized by educational institutions as a valid health concern. Implementation of student wellness programs, awareness on menstruation and seeking timely health consultation can support academic outcomes and student welfare of those who are impacted by menstruation. The present study does have some limitations, in spite of its important findings. The sample size was relatively small, the study was conducted on limits of students which may diminish the extent to which the results are generalizable. The cross sectional design also does not allow for the determination of cause-and-effect relations between PMS and academic achievement. Second, some of the information for the PMS severity and academic variables were self-reported, potentially leading to reporting bias. Additional multicenter, longitudinal studies involving larger samples and uniform assessment tools for PMS are recommended to better elucidate the relationship between PMS severity with academic outcomes.

In overall, the present study shows that the impact of PMS on academic performance of undergraduate medical students is great and negative. The findings highlight the importance of raising awareness, early detection and supportive measures to enhance the menstrual health of females and maximize their performance in educational activities.

CONCLUSION

Premenstrual syndrome is an important health problem among undergraduate medical students and it adversely affects the academic performance of a student. This study showed that students who had more severe PMS were likely to have poorer academic outcomes than students who had less severe PMS. The physical, emotional and cognitive changes in PMS can negatively impact concentration, learning ability and education productivity.

The results highlight the need for early detection and proper treatment of PMS in the school environment. Raised awareness on menstrual health, provision of psychological and medical support services and fostering healthy lifestyle changes can help minimize symptoms and enhance academic achievement for female students. Larger, multicenter studies are suggested to achieve a deeper understanding of the long-term educational and psychosocial impact of PMS in university students.

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