A Cross-Sectional Study on Clinical Profile and Factors Associated with Premenstrual Syndrome among Adolescent Girls in Goa

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Abstract:

Introduction: : Premenstrual syndrome (PMS) is a group of physical and psychological symptoms that occur during the luteal phase of the menstrual cycle. **Objective:** To determine the proportion of adolescent girls suffering Premenstrual Syndrome using ACOG criteria, to describe the clinical presentations of PMS and to identify the factors associated with PMS among them. **Method:** A cross-sectional study included adolescent girls in XI and XII standards from selected Higher Secondary Schools in Goa. A sample size of 210 was calculated with a 95% confidence interval, p=0.73, and an absolute error of 0.06. A pre-tested questionnaire covering socio-demographic details, menstrual history, PMS symptoms, and lifestyle factors was distributed before a health talk to girls who had attained menarche, experienced at least three menstrual cycles, and were willing to participate. BMI was calculated and classified per Asian Pacific guidelines. Regular menstruation was defined as cycles averaging 28 ± 7 days and 3–5 days of bleeding. PMS was assessed using ACOG criteria. Data were analyzed using Jamovi Software version 2.3.28, employing descriptive statistics and the Chi-square test to study associations between variables and PMS. **Results:** In a cross-sectional study among 228 adolescent girls, more than half (59.2%) of the girls reported to have PMS. The mean BMI of the participants was 20.1 ± 4.31 kg/m^2. Irritability was reported to be the most frequent symptom in as high as 41.7% girls. Nearly two-thirds of the adolescent girls (64%) reported to have heavy flow, while the majority of the girls (91.7%) suffered from dysmenorrhea. PMS was found to be associated with age at menarche, amount of blood flow during menstruation and presence of dysmenorrhea ($p < 0.05$). **Conclusion:** This study revealed that 59.2% of adolescent girls reported to have PMS. Schools should foster an environment where students feel comfortable discussing PMS and other women's health issues.

Keywords: Adolescent Girls, Dysmenorrhea, Menstrual Cycle, Premenstrual Syndrome

Introduction:

Premenstrual syndrome (PMS) is the term used to describe a group of physical and psychological symptoms that occur during the luteal phase of the menstrual cycle and are clinically significant. [1] These symptoms can cause severe discomfort and functional impairment. Globally, the pooled prevalence of PMS-affected women in their reproductive years is 47.8%.[2] In about 5% of women the symptoms are so severe that they interfere with personal and social relationships or work, in many cases requiring pharmacological treatment.[3]

American College of Obstetrician and Gynaecologist (ACOG) put forward a criteria which

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consists of any one of the Affective symptoms (Depression, Angry outbursts, Irritability, Anxiety, Confusion and Social withdrawal) and Somatic symptoms (Breast tenderness, Abdominal bloating, Headache and Swelling of extremities).[1] These symptoms should occur in the three prior menstrual cycles during the 5 days before the onset of menses and the symptom must resolve within 4 days of onset of menses and not recur until after day 12 of the cycle.[1] The cause of PMS has remained unknown, and the research results refer to multiplicity of its causes. Women with PMS reported reduced work productivity and more work days missed for health reasons. High-school students with PMS were more likely to lack concentration and motivation and to have poorer academic performance.[4] Women with PMS often fail to go to work or school, resulting in an impaired quality of life.[5]

Since there are few published studies that have explored the magnitude of PMS, this study was conducted among adolescent girls in selected higher secondary schools of Goa. The objectives of the study were to determine the proportion of adolescent girls suffering Premenstrual Syndrome, to describe the clinical presentations of PMS among such girls and to identify the factors associated with PMS among them.

Method:

The present cross-sectional study was conducted among adolescent girls studying in XI and XII standards of Science, Commerce and Arts streams of selected government Higher Secondary Schools in Goa. Schools were selected using simple random sampling. A sample size of 210 was calculated by taking z=1.96, read from a standardized normal distribution table with 95% CI, p=0.73 is the proportion of most common somatic symptom as pain abdomen from a study by Kavita S Konapur, d=0.06 is the absolute error.[6]

The self-administered questionnaire was administered to the study population prior to a health talk. A total of 228 adolescent girls studying in XI and XII standards Science, Commerce and Arts streams of selected Higher Secondary Schools in Goa present for the health talk, who were ≤ 19 years of age, had attained menarche & had at least 3 menstrual cycles in the past and were willing to participate in the study were included. Those who were absent on the day of data collection were excluded from the study. The study was conducted over a period of one month. The questionnaire comprised information regarding the socio-demographic details, menstrual history, details regarding symptoms of premenstrual syndrome and lifestyle among the study participants.

Data was collected through in-person interviews using a pre-tested and pre-designed questionnaire. Weight and height were used to calculate body mass index (BMI) using the formula: BMI = weight in kg/height in m^2. BMI was classified into four groups based on the cutoff points recommended by Asian Pacific body mass index.[7] Pattern of menstruation was assessed by length of menstrual cycle and duration of menstruation. Cycle with an average rhythm of 28 ± 7 days and 3–5 days of bleeding is a regular menstruation.[8] ACOG criteria were used for assessment of PMS. [1] It contains six affective and four somatic symptoms. Symptoms must also meet the following criteria: (i) be relieved within 4 days of the onset of menses, without recurrence until at least cycle day 13; (ii) be present in the absence of any pharmacologic therapy, hormone ingestion, or drug or alcohol use; (iii) be causing identifiable dysfunction in social or economic performance; and (iv) occur reproducibly during two cycles of prospective recording.[1]

Ethical clearance was obtained from the Institutional Ethics Committee of Goa Medical College prior to starting the study (Reference code: GMCIEC/2024/187). Written informed consent was obtained from the parents and assent was obtained from the study participants. Data was analyzed using Jamovi Software version 2.3.28 (R based program). Descriptive statistics were used to describe and present the data. Chi-square test was used to study association between study variables and PMS.

Results:

The mean age of the students was 16.6 ± 0.78 (SD) years. Table 1 shows the distribution of adolescent girls according to the sociodemographic factors. The mean BMI of the participants was 20.1 ±

Table 1: Distribution of Adolescent Girls according to the Socio-Demographic Factors (N=228)

Variables	Category	n (%)
Age (Years)	≤16 years	110 (48.2)
	>17 years	118 (51.8)
BMI	Underweight	89 (39)
	Normal	95 (41.7)
	Overweight	19 (8.3)
	Obese	25 (11)
Mother's Educational Status	Graduation	21 (9.2)
	Higher Secondary	63 (27.6)
	High School	112 (49.1)
	Primary	26 (11.4)
	Illiterate	6 (2.6)
Mother's Occupation	Homemaker	162 (71.1)
	Working	66 (28.9)

4.31 (range, 12.4 - 41.6) kg/m^2. Almost half (41.7%) of the study participants had normal BMI, while 39% were underweight, 8.3 % and 11% were overweight and obese respectively. Majority of the mothers of the girls were educated up to high school (49.1%), while 2.6% of them were illiterates. In majority of them, mothers were homemakers (71.1%) by occupation.

Table 2 shows association between physical factors and premenstrual syndrome. Majority of the participants (61%) had their menarche from 12-14 years of age, while 18.4% of them had their menarche after 14 years of age. Most of the study participants (86%) had regular cycles, while almost half of them (56.6%) reported to have cycles longer than 5 days. Nearly, two-third of the adolescent girls (64%) reported to have heavy flow, while the majority of the girls (91.7%) suffered from dysmenorrhea. No statistical significance was observed with regularity of the cycle and duration of cycle. However, it was found to be associated with age at menarche, amount of blood flow during menstruation and presence of dysmenorrhea ($p < 0.05$).

Table 2: Association between Physical Factors and Premenstrual Syndrome (N=228)

Physical factors	Premenstrual Syndrome		Chi square value p value
	Present	Absent	
	n (%)	n (%)	
Age at menarche			
≤14 years	103 (45.2)	83 (36.4)	6.15, 0.013
>14 years	32 (14)	10 (4.4)	
Regularity of the cycle			
Regular	115 (50.4)	81 (35.5)	0.167, 0.683
Irregular	20 (8.8)	12 (5.3)	
Menstrual Bleeding			
Normal or low	39 (17.1)	43 (18.9)	7.20, 0.007
Heavy	96 (42.1)	50 (21.9)	
Duration of cycle			
≤ 5 days	56 (24.6)	43 (18.9)	0.507, 0.477
>5 days	79 (34.6)	50 (21.9)	
Dysmenorrhea			
Present	128 (56.1)	81 (35.5)	4.29, 0.038
Absent	7 (3.1)	12(5.3)	

Table 3: Association between Lifestyle Factors and Premenstrual Syndrome (N=228)

Lifestyle factors	Premenstrual syndrome				Chi square value, p value
	Present		Absent		
	n	%	n	%	
Exercise					
Present	31	13.6	19	8.3	0.206, 0.650
Absent	104	45.6	74	32.5	
Sleep					
Adequate	42	18.4	27	11.8	0.113, 0.737
Inadequate	93	40.8	66	28.9	
Screentime					
<6 hours	87	38.2	71	31.1	3.66, 0.056
>6 hours	48	21.1	22	9.6	
BMI					
<23 kg/m^2	109	47.8	75	32.9	3.23, 0.986
≥23 kg/m^2	26	11.4	18	7.9	

About 59.2% of the girls reported to have PMS. Of the affective symptoms in ACOG criteria, 19.7% reported depression. Anger was reported by 32.5% of girls. Irritability was reported to be the most frequent symptom in as high as 41.7% girls. Anxiety and confusion were reported by 11.8% and 21.10% adolescent girls. Around 32.9% experienced breast pain, while social rejection was faced by 26.3% of girls during that period. Headache was reported by almost one third of them (27.6%) and abdominal distension was reported by very few (9.2%) students. None of them reported limb swelling in the premenstrual period.

Table 3 shows the association between the lifestyle factors and PMS. No statistical significance was observed with exercise, sleep, screen time and BMI of the participants. ($p < 0.05$). Nearly one third of the participants (30.3%) said that the PMS symptoms interfered with their school/ work efficiency or productivity.

Discussion:

Two hundred and twenty eight adolescent girls took part in this study from selected schools in Goa. The majority of them were aged 16 years (n=110, 48.2%). In the present study, more than half (59.2%) of the girls reported to have PMS. This finding was similar to a study done by Sarkar et al. in which 61.5% of the participants reported to have PMS.[9] The variance in the prevalence of PMS amongst different research studies may result from variations in diagnostic standards, populations under study, ethnicity and culture, and data collection techniques.

Among the 228 participants, 86% had regular cycles, 56.6% had a cycle duration of more than five days, and 91.7% had dysmenorrhea. Nearly half of the participants in our study did not exercise at all (n=101, 44.3%), over half had a sleep duration of six to eight hours per day (n=129, 56.6%), and majority had menarche at the age of 12-14 years (n=139, 61%).

There were no significant relation between the incidence of premenstrual symptoms and regularity of menstrual cycle according to a study in Japan.[10] In line with the findings of our study, Tolossa and Bekele showed that there was no significant relationship between PMS and BMI.[11]

The most commonly prevalent performance impairment interfering with the daily activities of the

participants was frequent class missing (28.3%), whereas in our study, one third of the participants (30.3%) reported PMS symptoms interfering with their school efficiency or productivity.

Riya S et al. reported the most common symptom in the respondents as anger/irritability. [12] This finding is similar to the present study where 47.7% of the participants experienced irritability prior to their menses followed by breast tenderness (32.9%) and anger (32.5%). The most frequent affective symptoms included anger outbursts (97.7%), anxiety (73.3%), and irritability (68.6%), which was similar to the reported findings in this study.

Statistically significant associations were observed between age at menarche, amount of blood flow during menstruation and presence of dysmenorrhea with PMS ($p < 0.05$).

Conclusion:

Study revealed that 59.2% of school-going adolescent girls From a Selected School had PMS. Schools should foster an environment where students feel comfortable discussing PMS and other women's health issues. This can be achieved by encouraging open communication between students and teachers, as well as providing resources and support for students experiencing PMS symptoms. Schools can ask health professionals to give health talks about PMS and answer any questions students may have. This may help debunk myths and give reliable information about the condition.

Limitations:

As the present study was a school-based study, the findings cannot be extrapolated to the general population. No clinical/psychiatric diagnosis to exclude underlying mental health problems was carried out in this study.

Declaration:

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Conflict of Interest: Nil

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