



## Prevalence of premenstrual syndrome in college going girls - A cross sectional study

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### ABSTRACT

**Problem considered:** Premenstrual syndrome (PMS) is one of the most common problems related to menstruation among young females. The severity of the symptoms of PMS differs among girls affecting their daily life activities and health-related lives. In developing countries like India there are many stigmas surrounding menstruation, these stigmas are big barrier for the women to seek help for their physical and mental discomfort. Hence, this study was conducted to estimate the prevalence of Premenstrual Syndrome among college-going girls in Belagavi, Karnataka, India.

**Methods:** A cross sectional study was conducted among 420 college-going girls of 18–25 years age group at several educational institutes of Belagavi city, Karnataka. Convenient sampling technique was used to enroll the subjects. Data was collected using predesigned, semi-structured, self-administered questionnaire. The data collected was analyzed using SPSS software 21.0 version.

**Results:** The mean age of menarche was found to be  $13.87 \pm 1.44$  years. The PMS prevalence was found to be 86%. Around 40.5% of the participants performed some type of physical activity, 59.5% did not do any physical activity. Most common psychological symptoms were depressed mood, irritability, mood swings, poor concentration, etc. Common physical symptoms were general body pain, headache, back pain, fatigue, joint pain, etc. Common behavioral symptoms were short temper, food cravings and oversleeping.

**Conclusion:** This study showed high prevalence of PMS in college-going girls. Therefore, teaching and awareness programs should be conducted in schools, college and at the community levels to improve knowledge about PMS and its management.

### 1. Introduction

Premenstrual syndrome (PMS) is a cyclic phenomenon occurring during the late luteal phase of the menstrual cycle. PMS is characterized by a group of physical, emotional, psychological symptoms of varying severity starting a week before the onset of the menstruation and ends after the onset of menstruation. Severe form of PMS is known as Premenstrual Syndrome Dysphoric Disorder (PMDD).

PMS is one of the common menstrual disorders, affecting many young women. According to epidemiological survey 75% suffer from symptoms of PMS and 3–8% suffer from severe symptoms of PMS.<sup>1</sup> The prevalence of PMS was found to be different in different countries, in China it was found to be 34%, 71% in turkey, 80% in Pakistan and 92% in Jordan.<sup>2</sup> In India a range of 14.3%–74.4% is the reported prevalence estimate of PMS.<sup>3</sup>

The exact cause of PMS is unknown. PMS is associated with various psychological, socio-demographic factors (age, living region, marital status). Dietary and lifestyle factors can cause the syndrome including habits like smoking, alcohol consumption, caffeine beverages, exercise and fat rich diet. Other factors include parents' income, being sexually active, long menstrual cycle and age at menarche.<sup>2,4,5</sup>

The diagnostic criteria for PMS according to the American College of Obstetrics and Gynaecology (ACOG) is that at least 1 affective (angry outburst, depression, anxiety, confusion, irritability and social withdrawal) and somatic (abdominal bloating, headache, breast tenderness, swelling of extremities) symptom must be experienced 5 days before the onset of menses for 3 menstrual cycles in a row and ends within 4 days after the onset of menses.<sup>4,5</sup>

The common premenstrual symptoms are irritability, lack of concentration, depression, abdominal bloating, abdominal cramps, breast

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tenderness, anger, general aches, nausea, vomiting, fatigue, decreased concentration, mood swings, headache, anxiety, sleep disturbance, appetite changes. These symptoms affect social and interpersonal relationship; health related quality of life, academic performances, daily living activities, occupational productivity and increased hospital visits.<sup>4,5</sup>

In developing countries like India there are many stigmas surrounding menstruation, these stigmas are big barrier for the women to seek help for their physical and mental discomfort. PMS is one of the common menstrual disorders, which is very common in college going girls affecting their relationships, activities of daily living, academics and cognitive functions. There are many possible risk factors for PMS.

Many studies have focused on menstruation and menstrual hygiene management but very few studies have been conducted on PMS which is more important.

As there is scarcity of studies on PMS, it is need of the hour to conduct more studies on PMS as these studies will help in easy diagnosis and improve knowledge about PMS and its risk factors. This will help in reducing the severity and prevalence of PMS and will also act as baseline data to conduct interventional studies. Therefore this study was conducted to estimate the prevalence of premenstrual syndrome among college going girls.

## 2. Materials and methods

**Study Design:** A Cross-Sectional Study.

**Source of Data:** This study was conducted at 8 different colleges in Belagavi city of Karnataka, India.

**Study Period:** from July 2021 to April 2022.

**Study Population:** All the college going girls of the age groups 18–25 years were included in this study. The girls were selected using convenient sampling technique.

Sample Size: 420.

The sample size was calculated by using formula:

$$n = z^2 pq / d^2$$

Where,  $z = 1.96$ .

$$p = 0.189$$

$$q = 1 - 0.189 = 0.811(1 - p)$$

$$d = 0.0378 \text{ (acceptable error = 20\% of } p) \quad n = (1.96)^2 * 0.189 * 0.811 / (0.0378)^2$$

$$= 0.5888$$

$$= 0.00142$$

$$n = 412$$

- Sample size was rounded off to – 420

### 2.1. Inclusion criteria

1. Female students of age group between 18 and 25 years
2. Willing to participate in the study by signing informed consent

### 2.2. Exclusion criteria

1. Amenorrhoea
2. Irregular menstrual cycle
3. Polycystic ovarian disease (PCOD)

### 2.3. Ethical consideration

Ethical clearance was obtained from Institutional Ethical and Research Committee, Jawaharlal Nehru Medical College, KAHER, Belagavi. Permission for data collection from the college girls was obtained from the principals of the respective colleges. Written informed

consent was obtained from participants.

### 2.4. Confidentiality

Superior care was taken to maintain the privacy and confidentiality of the study participants.

### 2.5. Data collection tool

Predesigned, Semi-structured Self-administered questionnaire.

### 2.6. Data collection procedures

After obtaining the permission from concerned authority, the participants were explained about the study in brief and informed consent was obtained from them. Data was collected by using Self-administered questionnaire. Questionnaire consisted information regarding Socio-demographic characteristics, characteristics of menstrual cycle and their lifestyle characteristics. Superior care was taken to maintain the privacy and confidentiality of the study participants.

### 2.7. Data analysis

The data collected was entered into M.S. Excel and checked for its completeness, then coded and entered into the SPSS software 20.0 version for analysis. The data analyzed was expressed into percentage and mean.

### 2.8. Operational definitions

1. **Mild degree of symptoms:** Although symptoms are present, they do not interfere with daily activities.
2. **Moderate degree of symptoms:** Observable symptoms that interfere with daily activities.
3. **Severe degree of symptoms:** Daily activities are being hampered by symptoms.
4. **Heavy blood flow:** Every two to 3 h the pad needs to be changed.
5. **Moderate blood flow:** two-three pads per day are required (every 5–6 h).
6. **Less blood flow:** 1–2 pads per day are required.

## 3. Results

**Table No 1:** shows socio-demographic profile of participants in which 44.8% were in the age group of 21–23 years. Maximum number of participants resided in urban area (63.3%). Around 76% females were enrolled in undergraduate course. Around 97.6% participants were unmarried.

**Table No 2:** shows menstrual characteristics of the study participants. Most of the participants (82.6%) had 25–31 days cycle of periods, in 94.5% participants bleeding lasted for 3–7 days and most of the participants (90%) had normal blood flow.

**Table No 3:** illustrates the lifestyle characteristics of the

**Table 1**  
Socio-demographic profile of the participants.

Variables	Category	Frequency	Percentage (%)
Age group	18–20	187	44.5
	21–23	188	44.8
	24–25	45	10.7
Residence	Urban	266	63.3
	Rural	154	36.7
Education level	postgraduate	101	24.0
	Undergraduate	319	76.0
Marital status	Married	10	2.4
	Unmarried	410	97.6

**Table 2**  
Menstrual cycle characteristics of study participants.

Variables	Category	Frequency	Percentage (%)
Length of the cycle	25–31 days	347	82.6
	31–35 days	73	17.4
Number of days bleeding lasts	3–7 days	397	94.5
	>7 days	23	5.5
Blood flow type	Less	17	4.0
	Normal	378	90.0
	Heavy	25	6.0

**Table 3**  
Lifestyle characteristics of the participants.

Variables	Category	Frequency	Percentage
Physical activity(any form of exercises)	No	250	59.5
	Yes	170	40.5
Smoking(active/passive)	No	414	98.6
	Yes	6	1.4
Alcohol	No	405	96.4
	Yes	15	3.6
Tobacco chewing	No	419	99.8
	Yes	1	0.2

participants. Around 40.5% of the participants performed some sort of physical activity daily, 98.6% of the subjects had no smoking habit, and majority of the subjects (96.4%) did not consume alcohol and 99.8% did not have habit of chewing tobacco.

**Table No 4:** shows degree of physical symptoms among the participants. Back pain (77.8%), general body pain (71.9%), abdominal cramps (68.3%), fatigue (55.2%), headache (53.8%) were the most common symptoms experienced by the participants.

**Table No 5:** shows lifestyle characteristics and education level of participants with and without PMS. Most of the (89.1%) postgraduate students had PMS.

**Figure No 1:** illustrates the degree of psychological symptoms. The most common psychological symptoms among the subjects were irritability (76.9%), mood swings (75.9%), anger (73%), anxiety (65.7%), and loss of interest (64%).

**Figure No 2:** illustrates degree of behavioral symptoms among the participants. Short temper (61.9%), food cravings (55.9%), uncontrollable anger (55.2%), over sleeping (54.7%) were the common behavioral symptoms among the girls.

Prevalence of Premenstrual Syndrome (PMS) was found to be 86% among the study participants.

#### 4. Discussion

Mensuration is a natural, bodily process. There is a lack of awareness and a lot of misinformation among young girls and a lot of stigmas around it in society. These stigmas affect the overall ability of girls and

**Table 4**  
Distribution of participants based on physical symptoms of PMS.

Type of symptoms	Symptoms	Degree of Symptoms			
		Not applied to me	Mild	Moderate	Severe
Physical symptoms	Breast tenderness	281 (66.9%)	96 (22.9%)	28 (6.7%)	15 (3.6%)
	Headache	194 (46.2%)	133 (31.7%)	67 (16.0%)	26 (6.2%)
	Back pain	93 (22.1%)	138 (32.9%)	107 (25.5%)	82 (19.5%)
	Abdominal cramps	133 (31.7%)	119 (28.3%)	88 (21.0%)	80 (19.0%)
	General body pain	118 (28.1%)	154 (36.7%)	98 (23.3%)	50 (11.9%)
	Joint pain	216 (51.4%)	122 (29.0%)	51 (12.1%)	31 (7.4%)
	Nausea	299 (71.2%)	75 (17.9%)	32 (7.6%)	14 (3.3%)
	Vomiting	333 (79.3%)	49 (11.7%)	26 (6.2%)	12 (2.9%)
	Abdominal bloating	253 (60.2%)	92 (21.9%)	49 (11.7%)	26 (6.2%)
	Constipation	292 (69.5%)	91 (21.7%)	28 (6.7%)	9 (2.1%)
	Fatigue	188 (44.8%)	131 (31.2%)	63 (15.0%)	38 (9.0%)

women. It is important to provide awareness and education about menstrual cycle and premenstrual syndrome so that people can talk openly about the problems they are facing related to periods, which will help in providing proper health care by making good health care policies relating to them.

In the present study 44.8% of the participants were in the age group of 21–23 years, 97.6% were unmarried, 46.82% of the participants in the age group of 21–23 years. Mean height, mean weight were almost similar to the research done in Northern Ethiopia in university female students conducted by Tolossa et al. and Bekele et al.<sup>5</sup> Majority of the participants (98%) were unmarried in a research conducted in UAE.<sup>6</sup> The present study 89.1% post graduate students had PMS, even after less number of post graduate student participants in the study and 85% of undergraduate suffered from PMS. These findings are similar to a study conducted by Mishra et al. in Ahmedabad, India.<sup>7</sup> More than half (63.6%)of the participants resided in urban area and only 36.4% resided in rural area these findings are similar to the study conducted in Egypt where 36.7% resided in rural and 63.3% in urban area.<sup>7</sup>

In this study the prevalence of the premenstrual syndrome (PMS) was found to be.

86%, while studies conducted in NCR (Delhi), Ahmedabad, Hyderabad, Maharashtra, Palestine, Lebanon and Egypt the prevalence was found to be 63.2%, 18.9%, 75%, 67%, 100%, 63% and 80.2% respectively. The difference in the prevalence can be due to different PMS diagnostic tools used, study population, socio-demographic, lifestyle characteristics and cultural beliefs.<sup>1,2,5,8–10</sup>

The most common PMS symptoms reported were fatigue (55.2%), general body pain (71.9%), irritability (76.9%), poor concentration, mood swings (75.9%), loss of interest (64%), back pain (77.8%), difficulty in making decisions, short temper (61.9%), abdominal cramps (68.3%), and anxiety (65.7%), headache (53.8%), anger (73%), food cravings (55.9%), uncontrollable anger (55.2%). Therefore symptoms

**Table 5**  
Distribution of participants based on lifestyle characteristics & education level with PMS.

Variables	Categories	PMS	No PMS
Physical activity (any form of exercises)	Yes	140 (82.4%)	30 (17.6%)
	No	221 (88.4%)	29 (11.6%)
Smoking(active/passive)	Yes	5 (83.3%)	1 (16.7%)
	No	356 (86.0%)	58 (14.0%)
Drinking Alcohol	Yes	14 (93.3%)	1 (6.7%)
	No	347 (85.7%)	58 (14.3%)
Education level	Postgraduate	90 (89.1%)	11 (10.9%)
	Undergraduate	271 (85.0%)	48 (15.0%)

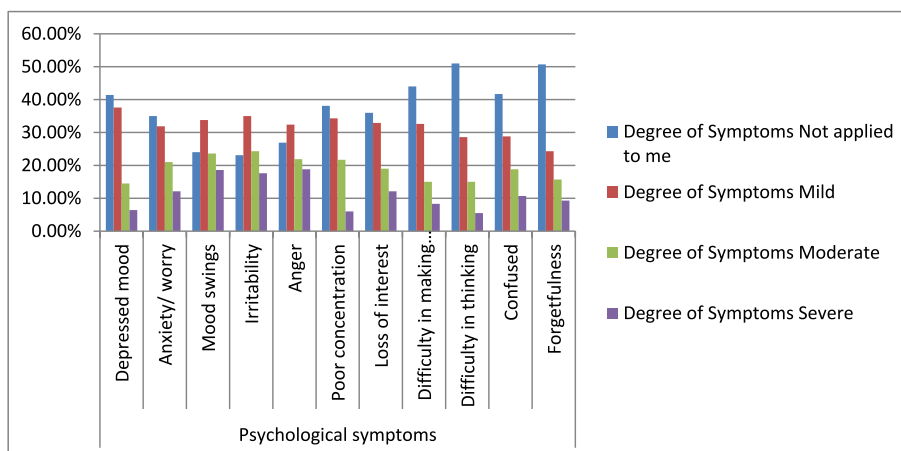


Fig. 1. Degree of psychological symptoms.

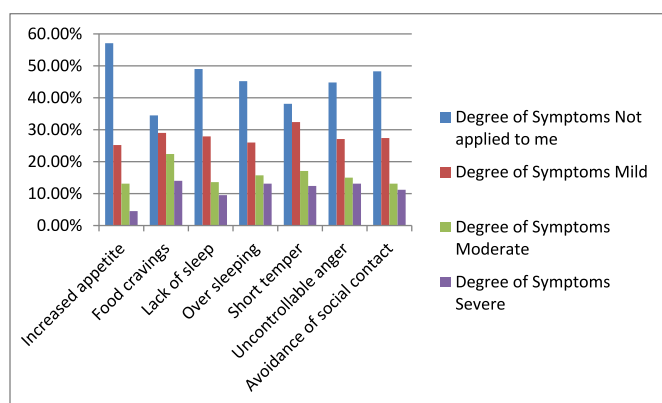


Fig. 2. Degree behavioral symptoms.

described in this study are less or more correspondent with the other studies.

The average age of menarche in this study was  $13.87 \pm 1.44$  years, these findings are more or less similar to a former study conducted by Sreelakshmi U et al. in Hyderabad and other study conducted in Iran which showed the mean age of menarche of  $12.81 \pm 1.22$  years and  $13.65 \pm 5.92$  years.<sup>10, 11</sup>

In majority of the participants length of the cycle was 25–31 days and had blood flow for 3–7 days and amount of blood flow was moderate in 90% participants, these results are similar to a study conducted in Uttarakhand, India in which the length of the cycle was 24–28 days, blood flow lasted for 3–5 days and amount of blood flow was medium in majority (87%) of the participants.<sup>12</sup>

Out of 221 participants who didn't do any type of physical activity, 88.4% had PMS.

Only 6 participants smoked, but the percentage of participants with PMS among them was high at 83.3% and 15 participants had the habit of consuming alcohol, among which 93.3% had PMS. These findings show that PMS and lifestyle characteristics can be related. Many studies show that lifestyle characteristics are associated with PMS and few others showed no association, this difference can be because of socio-demographic, cultural factors and beliefs. This study did not check for any type of association between the PMS and various characteristics.

#### 4.1. Limitations

The sampling technique used in the present study was convenient sampling which limits the generalizability of the results of our study.

#### 4.2. Recommendations

- Teaching and awareness programs should be conducted in schools, college and at the community levels to improve knowledge about PMS and its management.
- Interventional studies should be conducted to know more about PMS, its risk factors and its management.
- Proper stress, anxiety and depression management techniques should be taught to college-going girls.

#### 5. Conclusion

The present study concluded that the prevalence of PMS was 86% among college-going girls in the study area which was on a higher side. The most common symptoms of PMS were depression, general body pain, fatigue, irritability, poor concentration, loss of interest, mood swings, abdominal cramps, short temper, etc. To combat these problems and to take out the stigma among the target population, teaching and awareness programs should be conducted in schools, college and at the community levels to improve knowledge about PMS and its management.

#### Ethical approval

Ethical clearance was obtained from Institutional Ethical and Research Committee, Jawaharlal Nehru Medical College, KAHER, Belagavi.

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#### Declaration of competing interest

No conflict of interests.

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