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Original Research Article

Impact of premenstrual syndrome on daily activities and quality of life: a survey analysis

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ABSTRACT

Background: PMS affects a surprisingly large share of women in their reproductive years; prevalence estimates range from 30–40%, climbing to 80% when mild and moderate cases are counted. This study looked at how common PMS symptoms are in women aged 18–40, and whether lifestyle factors like diet, exercise, and stress have any bearing on their frequency or severity.

Methods: An online survey via Google Forms captured data on demographics, menstrual history, PMS awareness, emotional and physical symptoms, diet, exercise, and stress levels. Of 684 responses received, 650 met inclusion criteria women aged 18–40 with regular cycles. Excluded were participants who were pregnant, lactating, chronically ill, had psychiatric diagnoses, recently used hormonal medications, or submitted incomplete/duplicate forms.

Results: Most participants (71.23%) had heard of PMS. Of those surveyed, 82% reported emotional symptoms like mood swings and irritability being the most common before their periods. Fatigue was nearly as widespread at 76%, while food cravings affected 59.54%. Medium menstrual flow was typical (75.08%), with 36% reporting blood clots. On the lifestyle side, 72.31% didn't exercise regularly, and just over half (53.69%) reported dealing with stress.

Conclusions: PMS awareness is reasonably high, but emotional and physical symptoms remain common and undertreated. The low exercise rates and elevated stress levels among participants point to lifestyle factors as potential targets both for further research and practical management strategies.

Keywords: Menstrual cycle, Gynaecology, Perimenopause, Exercise, Nutrition

INTRODUCTION

Premenstrual syndrome can be widely defined as any group of physical and psychological signs that recurs frequently during the fertile stage of the menstrual cycle and lasts for a minimum of a week during the follicular stage of the cycle and causes anxiety and deterioration of function.¹ The cause of premenstrual syndrome is unknown. Because PMS signs appear along with the menstrual cycle's hormonal variations, hormonal disproportions such as estrogen surplus and progesterone shortage have been hypothesized.² Possible factors include hormonal dysregulation, insufficient progesterone levels

during the secretory phase of the menstrual cycle, aberrant neurotransmitter responses to ovarian signaling, and abnormal aldosterone function.³ The clinical signs and symptoms are divided into- behavioral symptoms which include food cravings, weariness, sleeplessness, dizziness, and changes in sexual interest, and physical symptoms which include an increase in body weight, inflammation of extremities, fluid detainment, vomiting tendency, and psychological signs which include mood swings, irritability, anxiety and many more.^{4,5} Epidemiological studies estimate that PMS affects approximately 20–40% of women of reproductive age globally, with severe forms like premenstrual dysphoric disorder (PMDD) affecting

around 3–8% of women. It is most prevalent in women aged 20–35 years and is influenced by factors such as higher body mass index (BMI), smoking, alcohol and caffeine consumption, stress, and family history. Prevalence rates are higher in low- and middle-income countries due to limited healthcare access and lifestyle differences. The economic correlation with premenstrual syndrome (PMS) lies in its direct and indirect impact on individual and societal productivity, healthcare costs, and quality of life. Women experiencing moderate to severe PMS often report reduced workplace performance, absenteeism, and presenteeism, resulting in significant economic losses. If left untreated it can lead to complications such as premenstrual dysphoric disorder (PMDD), pre menstruation syndrome depression, menstrual migraine, polycystic ovarian disease (PCOD), and polycystic ovary syndrome (PCOS). If polycystic ovarian disease is not treated, it can lead to infertility.⁶⁻⁸

Diagnosis

According to American College of Obstetricians And Gynecologist (ACOG) criteria

Diagnosis can be made by checking the presence of signs should in the females having PMS: 1) for at least three menstruation cycles, symptoms should be present for 5 days before the actual menstruation starts, 2) terminate within 4 days after the start of a period, 3) hindrance with normal daily activities.⁹

Objectives

Determine the occurrence and severity of premenstrual syndrome (PMS) symptoms in women aged 18 to 40 years. Analyze the relationship between PMS symptoms and lifestyle variables such as diet, exercise and stress. Identify common patterns and associations in PMS symptoms and related factors. Offer insights into factors affecting the prevalence and intensity of PMS symptoms. Assist in developing effective management strategies to improve women's menstrual health.

METHODS

Study design

A cross-sectional, questionnaire-based survey was conducted to assess the prevalence and severity of premenstrual syndrome (PMS) symptoms and their association with lifestyle factors in women of reproductive age.

Study site and period

The survey was carried out in Vadodara, Gujarat, India, over a five-month period from July 2023 to November 2023. Participants were recruited through the Faculty of Pharmacy, Parul University, Vadodara, and via online

circulation of the questionnaire link across the wider Vadodara community.

Selection criteria

Inclusion criteria

Females aged 18–40 years with regular menstrual cycles (21–35-day interval), able to read and respond in English, and willing to provide informed consent electronically.

Exclusion criteria

Pregnant or lactating women; participants with a diagnosed chronic medical illness (endocrine, cardiovascular, renal or hepatic disease); known psychiatric disorder or ongoing psychotropic therapy; use of hormonal contraceptives, hormone replacement therapy or other hormonal medication within the preceding three months; and incomplete or duplicate submissions.

Procedure

A structured, self-administered questionnaire was developed by the investigators after review of published PMS instruments including the American College of Obstetricians and Gynecologists (ACOG) diagnostic criteria and the premenstrual symptom screening tool (PSST). The instrument comprised 28 items across five domains: (i) demographic profile (age, height, weight, from which body mass index was derived); (ii) menstrual history (age at menarche, cycle regularity, cycle length, type of flow, presence of clots); (iii) awareness of PMS; (iv) premenstrual emotional and physical symptoms during the week preceding menstruation (mood swings, irritability, loss of interest, difficulty concentrating, fatigue, food cravings); and (v) lifestyle variables (dietary pattern, consumption of leafy vegetables, exercise frequency, perceived stress, sleep duration).

The questionnaire was pilot-tested on 20 female volunteers to check clarity and face validity, and minor wording refinements were incorporated. The finalised questionnaire was hosted on Google Forms and disseminated between July to November 2023 through institutional email lists, WhatsApp groups and social media platforms. An introductory page explaining the study purpose, voluntary participation and data confidentiality preceded the questions; participants indicated informed consent by ticking a mandatory consent statement before proceeding. No personal identifiers were collected, and each respondent could submit the form only once. A total of 684 responses were received; after exclusion of 34 incomplete or duplicate entries, 650 responses fulfilling the eligibility criteria were included in the final analysis.

Ethical approval

Ethics approval was not required for this population-based study, as it involved minimal risk and anonymous

participation. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki (2013 revision). Electronic informed consent was obtained from every participant at the start of the Google Form, and anonymity of respondents was maintained throughout.

Statistical analysis

Data from Google Forms were exported to Microsoft Excel 2019 and cleaned for duplicates, missing entries and out-of-range values. Statistical analysis was performed using IBM SPSS Statistics version 25.0 (IBM Corp., Armonk, NY). Categorical variables were summarised as frequencies and percentages, and continuous variables as mean±standard deviation. Body mass index was calculated as weight (kg) divided by height squared (m²) and categorised as per World Health Organization Asian criteria. Chi-square test was used to examine associations between PMS symptoms and lifestyle variables (exercise, stress, dietary pattern). A p value <0.05 was considered statistically significant. Results are presented as tables and bar graphs.

RESULTS

A total of 684 responses were obtained in the survey on premenstrual syndrome (PMS) among women aged 18-40 years. After excluding 34 responses due to incomplete data, the remaining 650 responses were subjected to statistical analysis.

Table 1 represents the age-wise distribution of the females enrolled in the survey which shows the majority of the participants were aged 18-22 years, comprising 65.24% of the total samples. In contrast, the lowest percentages were observed in the 30-32 and 32-34 age groups, each representing only 1.53% of the participants. This suggests that the majority of participants are of the younger population. The majority of participants (49.7%) were between 140-160 cm in height, with the lowest percentages of 0.15% in the 100-120 cm and 180-200 cm height ranges. Table 2 presents the highest and lowest proportion of females according to weight. The highest proportion of females (18.93%) was in the 45-50 kg group while the lowest (0.15%) was the 85-90 kg group.

Table 1: Age-wise distribution of females enrolled in survey.

Age (years)	Number of female(s) (n=650)	Percentage (%)
18-20	212	32.62
20-22	212	32.62
22-24	72	11.1
24-26	44	6.76
26-28	17	2.62
28-30	28	4.3
30-32	10	1.53
32-34	10	1.53
34-36	12	1.85
36-38	15	2.31
38-40	18	2.76

Table 2: Height wise and weight wise distribution of females participated.

Distribution of females participated	Number of female(s) (n=650)	Percentage (%)
Height wise (cm)		
100-120	1	0.15
120-140	41	6.30
140-160	323	49.7
160-180	284	43.7
180-200	1	0.15
Weight wise (kg)		
30-35	7	1.07
35-40	51	7.85
40-45	120	18.46
45-50	123	18.93
50-55	105	16.15
55-60	99	15.23
60-65	65	10
65-70	45	6.93

Continued.

Distribution of females participated	Number of female(s) (n=650)	Percentage (%)
70-75	19	2.92
75-80	10	1.54
80-85	5	0.77
85-90	1	0.15

The distribution of Body Mass Index (BMI) for the female respondents of the survey in a bar chart. Most of the subjects had a BMI in the normal range of 18.5-24.9, with over 350 females in this BMI category. This was followed by a large number of participants with BMI less than 18.5 indicating underweight, with around 150 females. There were over 100 participants in the overweight category (BMI 25-29.9). The number of females in the obese categories (BMI 30-34.9 and >35) was much lower, with under 50 participants in total, indicating a smaller prevalence of higher BMI values in the sample as shown in Figure 1.

Figure 2 shows that most of the female respondents, 72%, said they ate salad and leafy vegetables in their diet, with 469 respondents answering yes to this question. In contrast, 28% of the participants, i.e., 181 persons, stated that they do not take salad and leafy vegetables in their regular diet. This implies that while most of the study population included these healthy food options in their diet, a large proportion did not.

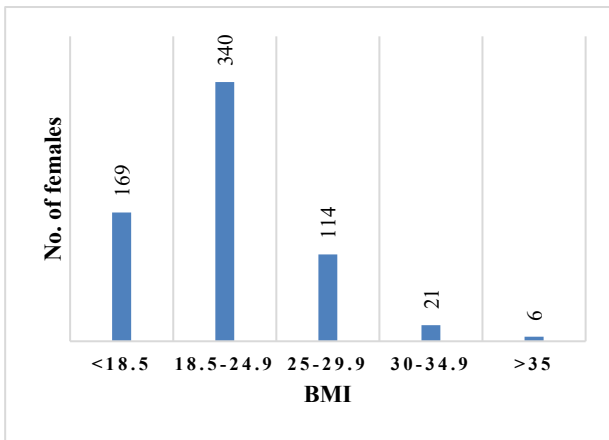


Figure 1: Graphical representation of BMI with the total number of females.

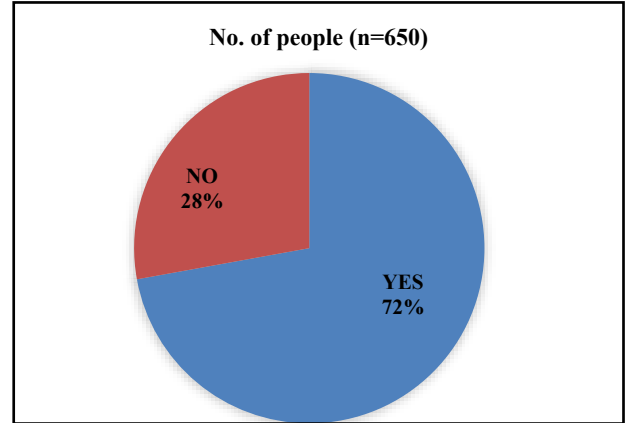


Figure 2: Consumption of green leafy vegetables by participants.

Table 3 highlighted data related to different aspects of premenstrual syndrome (PMS) and its impact on the surveyed women. As per Table 3, 71.23% of the respondents were aware about PMS and 28.77% were not aware about PMS. Table 3 reveals that 80.93% of women had regular periods while 19.07% had irregular cycles. Table 3 shows that 60.92% of individuals reported a loss of interest in activities in the week before their period, while 39.08% did not. Table 3 showed that 57.54% said that they have trouble concentrating or focusing on tasks before menstruation, while 42.46% did not have this problem. The lethargy or more tiredness in the week before their period was 76.15% and 23.85% did not experience more fatigue as shown in Table 3. Finally, Table 3 indicates that 59.54% of the respondents had a tendency to overeat or crave specific foods as their period approached, and 40.46% of the respondents did not report any such cravings. Overall, the data indicated the women surveyed experienced PMS symptoms like mood swings, exhaustion and cravings, revealing both the commonalities and nuances of menstrual health.

Table 3: Questionnaire on PMS.

Responses to questionnaire	Number of females	Percentage (%)
Do you know about PMS?		
Yes	463	71.23
No	187	28.77
Is your period regular?		
Yes	526	80.93
No	124	19.07
In the week before your period, do you notice that you lack interest in activities?		
Yes	396	60.92
No	254	39.08

Continued.

Responses to questionnaire	Number of females	Percentage (%)
Prior to menstruation, do you find it more difficult to concentrate or focus on tasks?		
Yes	374	57.54
No	276	42.46
Do you feel lethargic or get tired more easily in the week leading up to your period in comparison to the rest of your cycle?		
Yes	495	76.15
No	155	23.85
When you are due on your period, are you more likely to indulge in overeating or crave certain foods?		
Yes	387	59.54
No	263	40.46

Table 4: Lifestyle factors affecting PMS.

Response to questionnaire	Number of females	Percentage (%)
What type of flow do you have?		
Light	57	8.77
Medium	488	75.08
Heavy	105	16.15
Do you have blood clots in your period?		
Yes	234	36
No	232	35.69
Maybe	184	28.32
Do you perform any kind of exercise?		
Yes	120	18.46
No	470	72.31
Maybe	60	9.23
Do you suffer from stress in your life?		
Yes	349	53.69
No	177	27.23
Maybe	124	19.08
What type of diet do you consume?		
Veg	348	53.5
Non-veg	35	5.4
Mixed	267	41.1

The tables presented data that gave insight into various aspects of female health and lifestyle choices. Table 4 categorization of menstrual flow among respondents with 8.77% experiencing light flow, 75.08% medium flow, and 16.15% heavy flow. Table 4 shows the answers on the presence of blood clots during periods where 36% answered “YES”, 35.69% “NO” and 28.32% were not sure (“MAYBE”). Table 4 shows the exercise habits, with 18.46% answering “YES” to routine exercise, 72.31% answering “NO” and 9.23% unsure (“MAYBE”). Table 4 showed the stress levels. 53.69% of the respondents had experienced stress (“YES”), 27.23% had not (“NO”) and 19.08% were unsure (“MAYBE”). Finally, Table 4 studied dietary patterns, with 53.5% choosing vegetarian diet (“veg”), 5.4% non-vegetarian (“non-veg”), and 41.1% a mixed diet. The results offered a comprehensive picture of the menstrual health, lifestyle factors such as physical activity and nutrition, and stress levels of the female population surveyed.

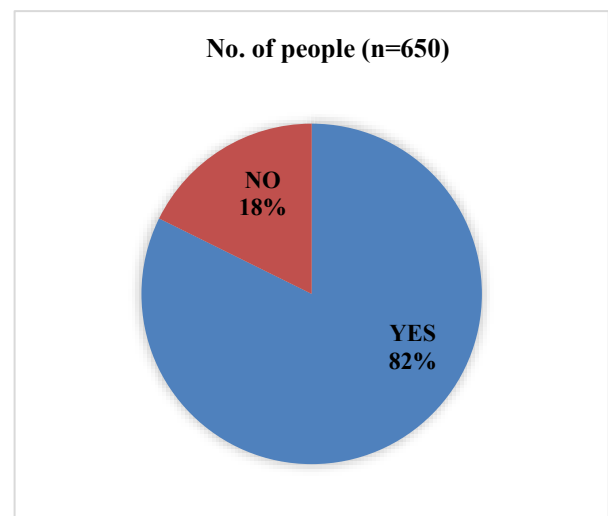


Figure 3: Prevalence of mood swings prior to periods in females.

DISCUSSION

This cross-sectional survey conducted in Vadodara, Gujarat, examined the prevalence of premenstrual symptoms and their relationship with lifestyle factors among 650 women aged 18–40 years. PMS awareness was reported by 71.23% of participants, while emotional symptoms such as mood swings and irritability (82%) and fatigue (76.15%) emerged as the most frequently reported premenstrual complaints. These figures are broadly consistent with published Indian data. Raval et al found PMS in 67.0% of college students in Bhavnagar, Gujarat using PSST instrument and irritability and mood swings were the main symptoms.¹⁰ Bhuvaneshwari et al in a study from Puducherry reported the prevalence of PMS as 62.7% and considerable impairment in quality of life among the students affected.¹¹ In more recent cross-sectional research of medical undergraduates in South India, Raja et al reported PMS in 71.1% of individuals with irritability (95.3%) and mood swings (92.6%) predominating, a symptom profile that closely resembles the pattern observed in our cohort.¹²

Fatigue was reported by 76.15% of women in the present survey, comparable to the 90.5% reported by Alagesan et al and the finding of Bhuvaneshwari et al that back, joint and muscle aches were the most common somatic complaints.^{11,13} Difficulty in concentration (57.54%) and loss of interest in usual activities (60.92%) support the observation of Delara et al that premenstrual cognitive and affective symptoms translate into measurable impairment of daily functioning and academic performance in young women.¹³

A striking finding of the present study is that 72.31% of participants did not perform any regular physical activity, and 53.69% reported experiencing stress. The literature on physical activity and PMS is not entirely uniform: while Kroll-Desrosiers et al. found no significant cross-sectional association between recreational physical activity and PMS severity in a US cohort of 414 women, more recent data from Vaghela et al and Kupcová et al demonstrated a significant inverse relationship between regular exercise and both perceived stress and premenstrual symptom scores.¹⁴⁻¹⁶ Evidence further supports aerobic exercise as an effective non-pharmacological intervention for PMS, with symptom reductions of the order of 30–60% after 4–8 weeks of structured training.¹⁶ The high burden of physical inactivity combined with elevated self-reported stress in our sample therefore represents a modifiable target for intervention.

Dietary patterns also appeared relevant. Food cravings were reported by 59.54% of women, whereas 72% consumed leafy vegetables regularly. Yoshimi et al in a study of Japanese high school students, found that irregular dietary intake and low vegetable consumption were significantly associated with moderate-to-severe PMS.⁸ Fernández et al in a systematic review and meta-analysis, further linked alcohol intake to elevated PMS

risk.⁷ Taken together, these observations suggest that nutrition-focused counselling — with emphasis on regular meals, adequate micronutrients (calcium, magnesium, vitamin B6, vitamin D) and limitation of caffeine and alcohol is likely to complement lifestyle-based management of PMS.

Menstrual characteristics observed in this cohort (medium flow in 75.08% and blood clots in 36%) fall within the range described in other Indian survey studies.^{10,17} The predominantly younger age distribution (65.24% aged 18–22 years) and the fact that most participants had a normal BMI indicate that PMS is a burden even in an otherwise healthy student-age population, a pattern also noted by Durairaj et al and consistent with global estimates that up to 75% of women of reproductive age experience at least one premenstrual symptom.^{4,14,17}

Beyond the clinical dimension, the persistent silence around menstrual health in the Indian sociocultural context deserves emphasis. Despite 71.23% of respondents being aware of PMS, the syndrome remains under-recognised and under-treated in routine practice.^{3,6} Strengthening menstrual health literacy, embedding brief PMS screening into primary care and gynaecology consultations, and promoting exercise, stress reduction and balanced nutrition are practical steps that could reduce the everyday impact of PMS in this population.

Limitations

This study has several limitations that should be considered when interpreting the findings. Self-reporting introduces bias, since participants may under- or over-report symptoms because of recall issues, personal perception, or a tendency to answer in socially desirable ways. The sample size is limited and lacks diversity in terms of age, race and socioeconomic background hence the results cannot be generalized to the wider community. PMS symptoms are also intrinsically subjective and vary greatly from person to person, making standardisation and comparison difficult. Most responses are based on a self-reported diagnosis without physician confirmation, leaving open the possibility that severity was overestimated, or that PMS was confused with related illnesses such as premenstrual dysphoric disorder (PMDD). Finally, the timing of the survey completion matters. Timing of when a participant answered (within or outside her menstrual cycle) can affect symptom perception and reporting.

CONCLUSION

This cross-sectional survey of 650 women aged 18–40 years in Vadodara, Gujarat, provides contemporary Indian evidence that premenstrual symptoms: particularly mood swings (82%), fatigue (76.15%) and food cravings (59.54%), are highly prevalent and coexist with modifiable lifestyle risk factors, most notably physical inactivity (72.31%) and self-reported stress (53.69%). Although

general awareness of PMS was reasonably high (71.23%), the symptom burden documented here indicates that awareness alone does not translate into effective self-management. By quantifying the intersection of premenstrual symptomatology and everyday lifestyle behaviours in a hitherto under-studied Western Indian population, this study advances current understanding of PMS as a lifestyle-sensitive condition and supports the integration of structured exercise, stress-management and dietary counselling into routine menstrual health care as first-line, low-cost strategies to reduce the personal, social and economic impact of PMS among Indian women of reproductive age.

Future direction

Future PMS surveys may increase the accuracy of measurement and the depth of understanding of the illness. Longitudinal studies following people over multiple menstrual cycles would provide more reliable information on how symptom patterns change over time. Combining mobile applications with wearable devices for real-time symptom collecting may enable reduction in recall bias and provide more granular data on day-to-day variations. It is also possible to explore the psychological and social dimensions of PMS more thoroughly, such as the impact of mental health, stress and social support on the severity of symptoms, which would assist to better understand the interaction between psychological and physiological aspects. Furthermore, survey data can be utilized in intervention studies to examine the effectiveness of lifestyle changes, dietary modifications, or drugs in symptom management. Looking at quality of life is just as important since understanding how PMS affects work, relationships and daily functioning makes a stronger argument for more supportive workplace regulations and better clinical care.

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