

Original article:

Prevalence and coping mechanisms of premenstrual syndrome (PMS) using a questionnaire and calendar technique

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Abstract

Introduction: With increasing awareness about various gynecological problems and menstrual abnormalities, it is important to know the level of awareness of PMS in women.

Objectives: To determine the prevalence of PMS, coping mechanisms used and to compare symptoms reported in the menstrual calendar and questionnaire.

Method: A cross-sectional study was conducted over a period of two months in students of a Medical College. Data was collected using a questionnaire (Phase 1 & 3) and a menstrual calendar (Phase 2). Fourteen symptoms were considered to assess PMS. Analysis was done by McNemar's Chi Square test.

Results: The most commonly reported symptoms on the analysis of the menstrual calendars were psychological including feeling sad/cranky/depressed (41.7%) and outbursts of anger/bad temper/frustration (34.81%). The other common complaints were rashes/acne, fatigue and pain in the back or pelvic region. The symptoms were classified as those related to fluid retention, pain, psychological symptoms, behavioural symptoms and others including GIT symptoms, acne, changes in sleep cycle etc.

Conclusion: This study thus shows the high prevalence of premenstrual syndrome as a common problem faced by majority of college going girls and also affects their daily lives. It has also shown that they are well aware about the problem. Also, the menstrual calendar has been an effective tool to identify the problems of PMS and has revealed that the girls are unable to identify symptoms of pain as a problem of PMS or dysmenorrhea. There is a recall bias in the reporting of the pain symptom with many girls reporting PMS as dysmenorrhea. The menstrual calendar can be used as an effective tool to accurately collect data regarding these symptoms.

Keywords: Premenstrual syndrome, dysmenorrhea

Introduction:

Pre-menstrual syndrome (PMS) or pre-menstrual tension is a collection of physical and emotional symptoms related to a woman's menstrual cycle. The symptoms start during the second half of the menstrual cycle and disappear 1 - 2 days after the menstruation starts. PMS is a psychosomatic disorder of unknown aetiology. It may be related to social, cultural, biological and psychological factors.¹The symptoms may be related to water

retention, emotional instability, mood changes or stress. The most common symptoms are bloating, breast tenderness, clumsiness, GIT changes, headache etc. other symptoms include confusion, difficulty in concentrating, fatigue, sadness, tension, anxiety, mood swings, irritable behaviour, sleep problems etc. There are no specific laboratory tests or signs to diagnose PMS. It is diagnosed on the basis of clinical history and complete physical examination to rule out other causes.¹

Menstrual morbidity has a significant impact on the socioeconomic life of a woman and can also take a toll on her health. Hence, it is important to study menstrual function in epidemiology as it not only tells us about the impact of the menstrual cycle on a woman's daily routine but also gives us an idea about her reproductive health and ovarian function. However, very few analysing strategies are known for the assessment of PMS.² One such method is the use of a menstrual calendar wherein each participant of the study is given a calendar and is asked to mark out her symptoms of PMS for a month and then the calendars are analysed.² The impact of premenstrual symptoms on activities of daily life in Korean women was studied and revealed that the approximate prevalence of PMS/premenstrual dysphoric disorder (PMDD) by the WHO's International Classification of Disease (ICD-10) was 98.6%. Among the 23 documented symptoms, the most predominant symptoms were joint-muscle back pain, abdominal pain, and irritability. Also, physical symptoms were more prevalent than mental symptoms.⁴ Another paper on "Global study of women's experiences of premenstrual symptoms and their effects on daily life" revealed that the most prevalent symptoms were abdominal bloating, cramps or abdominal pain, irritability, mastalgia and joint/muscle/back pains and four of the five most prevalent premenstrual symptoms were physical.⁵ As appropriate sampling techniques for identification of premenstrual syndrome and dysmenorrhoea are very few in number, a study done to evaluate the criteria used for identification of PMS showed that irrespective of the criteria used to define it, PMS is associated with reductions in health-related quality of life and work productivity impairment.⁶ A study conducted to identify the prevalence of PMS and fluctuation over time showed that 4.1% of women qualified for severe

PMS (six symptoms) and 8.1% qualified for moderate PMS (one to five symptoms), resulting in 12.2% of women who reported PMS symptoms that impacted their daily lives. 72% women demonstrated fluctuation in their PMS status.⁷

Methodology:

An institution based cross-sectional study was conducted over a period of two months in April and May 2013 to collect the data followed by data analysis. The study population consisted of undergraduate students studying in II and III MBBS in B.J. Govt. Medical College, Pune. The population included all the girls enrolled for the course; day scholars as well as hostilities. Considering a proportion of 50%, absolute precision of 8% points and confidence of 95% the sample size calculated was 156. Considering the drop out and non-response a final sample size of 170 was considered appropriate for the study. The sampling was done using proportionate stratified sampling. The two strata considered are medical students and nursing students.

The study population included all the girls studying at the undergraduate level in these colleges and who have a regular menstrual cycle. Those with any underlying gynecological pathology or evidence/presence of secondary dysmenorrhea were excluded from the study. Also girls with amenorrhoea, oligomenorrhoea etc. were excluded from the study. The tools used for this study included a questionnaire and a menstrual calendar. The questionnaire used for the study was tested for its validity and was used to obtain general information such as age of the student, age at menarche, height, weight etc. the other items included were length of menstrual cycle, severity of bleeding, accompanying pain and its severity, awareness about treatment options, relief measures used, effect on routine activities etc. Also,

awareness about pre-menstrual syndrome and symptoms experienced were studied. The symptoms experienced during PMS and coping methods used will be compared. The menstrual calendar comprised of a month-long study of the moods and symptoms of the patient to study and compare PMS and dysmenorrhea. The calendar was recorded by each girl for a period of one month i.e. one entire menstrual cycle. The girls were asked to analyze their mood and presence of any symptoms throughout the month and record it against the day specified on the calendar. The calendar had columns for various symptoms, menstrual bleeding, coping strategies and interference with routine activities.

Data collection for this study was done in 3 phases:

1. In phase 1, questionnaires were given to all the subjects and the purpose of the study was explained to them. The questionnaires were collected and kept for further analysis at the end of the data collection.
2. In phase 2, the Menstrual calendar was used. All the girls who filled out the questionnaires received a menstrual calendar with 30 days marked on it. They were asked to fill out the calendar daily for a period of 1 month to record symptoms, coping mechanisms etc. The calendars were collected at the end of one month for data analysis.
3. In phase 3, once again, the questionnaire was given to all the participants of the study and they were told to fill it out once again. This was done so as to compare with the questionnaire filled out by the subjects before the use of the menstrual calendar for one month.

The data collected from the three phases was analyzed to study the objectives and the data

obtained was used to compare information obtained during the 3 phases of the study.

If a symptom was present during the second half of the menstrual cycle and disappeared with the onset of menses or within 1-2 days of menses, it was categorised as a symptom of premenstrual syndrome. The data was analyzed using McNemar's Chi square test and co-relation co-efficient. The variables used were PMS, coping mechanisms including use of medication, massage etc., effect of PMS on daily routine etc.

Confidentiality about the details of all the students was maintained throughout the study. Permission has been obtained from the Institutional Ethics Committee regarding the project and informed consent was taken from all the students participating in the study.

Observations and results:

The study was conducted in 170 girls who received the calendars for a period of one month following which duly filled in calendars were returned by 158 girls who filled in the questionnaires for phase 3 of the project. Of the 158 girls, 112 resided in hostels while 56 were day scholars. Most of the participants of the study (84.8%) were in the age group of 19-21 years. About 71% of the participants had a normal Body Mass Index ranging from 18.5 to 24.99 while, 5.7% were underweight and 12% overweight. The phase 1 questionnaire showed that out of the 158 girls who participated in the study, 136 (86.08%) were aware of the term Premenstrual syndrome. Prevalence of at least one of the premenstrual symptoms was seen in 89.24% girls as revealed by the analysis of the phase 1 questionnaires while phase 3 analysis revealed presence of at least one symptom in 91.77% girls. Analysis of the menstrual calendar revealed the same in 91.14% girls. The symptoms and their prevalence as seen on the menstrual calendar are shown in Table 1.

Table 1: Prevalence of symptoms of PMS in Menstrual calendar.

Sr. no.	Symptom	Present (n=158)	Percentage
1	Lack of concentration	52	32.91%
2	Anxiety/ Tension	45	28.48%
3	Outbursts of anger/ Bad temper/Frustration	55	34.81%
4	Feeling sad/ Cranky/ Depressed	66	41.77%
5	Backache/ Joint and muscle pain/Body ache	53	33.54%
6	Pain in the pelvic region	56	35.44%
7	Abdominal discomfort/ GIT symptoms	48	30.38%
8	Oedema/ Swelling/ Puffiness/ Water retention	13	8.23%
9	Feeling bloated/ Weight gain	27	17.09%
10	Pain/ Tenderness/ Enlargement/Swelling of breasts	22	13.92%
11	Changes in sleep cycle	52	32.91%
12	Changes in appetite/ Food cravings	43	27.21%
13	Skin changes (Rashes/ Acne)	56	35.44%
14	Fatigue/ Tiredness	54	34.18%

The most commonly reported symptoms on the analysis of the menstrual calendars were psychological including feeling sad/cranky/depressed (41.7%) and outbursts of anger/bad temper/frustration (34.81%). The other common complaints were rashes/acne, fatigue and pain in the back or pelvic region. The symptoms

were classified as those related to fluid retention, pain, psychological symptoms, behavioural symptoms and others including GIT symptoms, acne, changes in sleep cycle etc. A comparative study of these symptoms before and after the use of the calendar revealed the following results: (Table 2)

Table 2: Category wise comparison of PMS symptoms. (Phase 1 vs Phase 2)

No.	Pre-menstrual symptom	At least 1 symptom present		
		Phase 1 (n=158)	Phase 2 (n=158)	Phase 3 (n=158)
1	Fluid retention (Oedema, bloating etc.)	32 (20.25%)	32 (20.25%)	34 (21.52%)
2	Pain (Back ache, body ache, pain in pelvic region, breasts etc.)	117 (74.05%)	78 (49.37%)	124 (78.48%)
3	Psychological (Anxiety, frustration, depression etc.)	88 (55.7%)	85 (53.8%)	89 (56.33%)
4	Behavioural (Lack of concentration, fatigue, changes in sleep cycle etc.)	84 (53.16%)	86 (54.43%)	96 (60.76%)
5	Others (GIT symptoms, acne, changes in appetite etc.)	107 (67.72%)	93 (58.86%)	115 (72.78%)

The questionnaires revealed that the most common symptoms were back aches, body ache, pain in the pelvic region etc. followed by acne and fatigue. On an average, 19.3% girls reported that the PMS symptoms were severe enough to affect their daily activities. For the symptoms of PMS, 31.65% girls of those who showed at least one symptom reported use of some coping mechanism in the phase 1 study which increased to 41.07% following the use of the

calendar. Further data analysis was also done using McNemar's Chi-square test to check for discordance and concordance of the symptoms with the use of the menstrual calendar. Comparison of the data obtained from the two questionnaires before and after use of the menstrual calendar showed that there was a significant difference (*P<0.05) in the reporting of the Skin changes (Rashes/ Acne) and lack of concentration. (Table 3)

Table 3: McNemar's Chi square test analysis of PMS symptoms. (Phase 1 vs Phase 3)

	SYMPTOM	CONCORDANCE		DISCORDANCE		χ^2
		Yes in both questionnaires	No in both questionnaires	Yes in Phase 1; No in Phase 2	No in Phase 1; Yes in Phase 2	
I.	FLUID RETENTION					
1	Oedema/ Swelling/ Puffiness/ Water retention	6 (3.8%)	137 (86.7%)	7 (4.43%)	8 (5.06%)	1.00
2	Feeling bloated/ Weight gain	20 (12.66%)	117 (74.05%)	10 (6.33%)	11 (6.96%)	1.00
II.	PAIN					
3	Backache/ Joint and muscle pain/ Body ache	26 (16.46%)	53 (33.54%)	25 (15.82%)	24 (15.19%)	0.00
4	Pain in the pelvic region	78 (49.37%)	30 (18.99%)	20 (12.66%)	30 (18.99%)	1.62
5	Pain/ Tenderness/ Enlargement/ Swelling of breasts	19 (12.03%)	130 (82.28%)	5 (3.16%)	4 (2.53%)	1.00
III.	PSYCHOLOGICAL					
6	Anxiety/ Tension	30 (18.99%)	82 (51.90%)	24 (15.19%)	22 (13.92%)	0.22
7	Outbursts of anger/ Bad temper/ Frustration	45 (28.48%)	79 (50.00%)	22 (13.92%)	12 (7.59%)	2.38
8	Feeling sad/ Cranky/ Depressed	38 (24.05%)	81 (51.27%)	17 (10.76%)	22 (13.92%)	0.41
IV	BEHAVIORAL					

9	Lack of concentration	24 (15.19%)	94 (59.49%)	13 (8.23%)	27 (17.09%)	4. 22 *
10	Fatigue/ Tiredness	51 (32.28%)	65 (41.14%)	22 (13.92%)	20 (12.66%)	0. 02 4
11	Changes in sleep cycle	16 (10.13%)	104 (65.82%)	15 (9.49%)	23 (14.56%)	1. 28 9
V.	OTHERS					
12	Abdominal discomfort/ GIT symptoms	34 (21.52%)	76 (48.10%)	22 (13.92%)	26 (16.46%)	0. 18 8
13	Changes in appetite/ Food cravings	20 (12.66%)	105 (66.46%)	21 (13.29%)	12 (7.60%)	1. 93 9
14	Skin changes (Rashes/ Acne)	61 (38.61%)	64 (40.51%)	10 (6.33%)	23 (14.56%)	4. 36 *

*P<0.05

Comparison of Phase 2 (Menstrual calendar) and Phase 3 (Questionnaires) showed a significant difference (*P<0.05) in four of the symptoms namely: Backache/ Joint and muscle pain/ Body ache; Pain in the pelvic region; Skin changes (Rashes/ Acne); Fatigue/ Tiredness. (Table 4)

Table 4: McNemar's Chi square test analysis of PMS symptoms. (Phase 2 vs Phase 3)

	SYMPTOM	CONCORDANCE		DISCORDANCE		χ^2
		Yes in both questionnaires	No in both questionnaires	Yes in Phase 1; No in Phase 2	No in Phase 1; Yes in Phase 2	
I.	FLUID RETENTION					
1	Oedema/ Swelling/ Puffiness/ Water retention	7 (4.43%)	138 (87.34%)	6 (3.80%)	7 (4.43%)	0.019
2	Feeling bloated/ Weight gain	18 (11.39%)	118 (74.68%)	9 (5.70%)	13 (8.23%)	0.523
II.	PAIN					
3	Backache/ Joint and muscle pain/ Body ache	38 (24.05%)	63 (39.87%)	15 (9.49%)	42 (26.58%)	11.86 *

4	Pain in the pelvic region	46 (29.11%)	40 (25.32%)	10 (6.33%)	62 (39.24%)	36.12 *
5	Pain/ Tenderness/ Enlargement/ Swelling of breasts	16 (10.13%)	129 (81.65%)	6 (3.80%)	7 (4.43%)	0.019
III.	PSYCHOLOGICAL					
6	Anxiety/ Tension	28 (17.72%)	89 (56.33%)	17 (10.76%)	24 (15.19%)	0.878
7	Outbursts of anger/ Bad temper/ Frustration	38 (24.05%)	84 (53.17%)	17 (10.76%)	19 (12.03%)	0.028
8	Feeling sad/ Cranky/ Depressed	41 (25.95%)	73 (46.20%)	25 (18.82%)	19 (12.03%)	0.568
IV.	BEHAVIORAL					
9	Lack of concentration	26 (16.46%)	81 (51.27%)	26 (16.46%)	25 (15.82%)	0.000
10	Fatigue/ Tiredness	35 (22.15%)	68 (43.04%)	19 (12.03%)	36 (22.79%)	4.655 *
11	Changes in sleep cycle	22 (13.92%)	89 (56.33%)	30 (18.99%)	17 (10.76%)	3.06
V.	OTHERS					
12	Abdominal discomfort/ GIT symptoms	28 (17.72%)	78 (49.37%)	20 (12.66%)	32 (20.25%)	2.32
13	Changes in appetite/ Food cravings	19 (12.03%)	102 (64.56%)	24 (15.19%)	13 (8.23%)	2.70
14	Skin changes (Rashes/ Acne)	52 (32.91%)	70 (44.30%)	4 (2.53%)	32 (20.25%)	20.25 *

*P<0.05

The major PMS symptoms for which coping mechanism were used are shown in Table 5.

Table 5: Coping mechanisms for PMS

Sr. no.	Symptom	Coping mechanism
1	Anxiety/ Tension	Distraction
2	Outbursts of anger/ Bad temper/Frustration	Meditation, Isolation, Counselling, Entertainment, Rest, Omega 3 fatty acids
3	Feeling sad/ Cranky/ Depressed	Rest, Music
4	Backache/ Joint and muscle pain/Body ache	NSAIDs, Hot water bag
5	Pain in the pelvic region	Heat fomentation, Rest, Pain killers, Antispasmodics, Jaggery
6	Abdominal discomfort/ GIT symptoms	Eat light foods, Antacids, Rest, Increased water intake
7	Oedema/ Swelling/	Coconut water

	Puffiness/ Water retention	
8	Changes in sleep cycle	Rest, Coffee
9	Skin changes (Rashes/ Acne)	Benzoyl peroxide, Hydration, Frequent face washing, Clindamycin, Bland diet, Turmeric
10	Fatigue/ Tiredness	Rest, Sleep

Most coping mechanisms have been used for the pain and psychological symptoms and other symptoms like acne and GIT discomfort.

Discussion:

The study has shown that there is a high prevalence of pre-menstrual syndrome which correlates with studies done previously in India and in other countries. Most of the girls who participated in the study (86%) were aware about the term Pre-menstrual syndrome even before the study and majority of them reported the presence of at least one of the symptoms of PMS which started a few days before the menses and subsided with the onset of or within 1-2 days of menses. The most commonly reported symptoms were psychological and those related to pain which are similar to findings in previous studies.^{4, 5} Analysis of the phase I questionnaires showed that PMS interferes with the daily activities of only 22.15% girls. Similar studies have also been done previously to assess the impact of PMS on the daily lives of women.^{6,7} Considering the coping mechanisms used for PMS, very few girls have resorted to the same. The pre-menstrual symptoms for which some of the girls have resorted to coping or treatment are symptoms related to pain, GIT symptoms, skin changes such as acne and psychological symptoms such as bad temper etc.

It was noted that not a very significant difference in the prevalence of the symptoms was seen before and after the use of the calendar and there is consistency in reporting of most of the symptoms throughout the study. This is probably since the girls are well aware about the symptoms

occurring every month. However, a significant difference was seen in the prevalence of pain in the pelvic region/ back and also skin changes and fatigue with the use of the calendar and the questionnaire. There was considerable discordance in the reporting of these symptoms as seen by statistical analysis. Of the 158 girls who participated in the study, pain symptoms were reported by 117 girls before using the calendar and 124 girls after using the calendar. Surprisingly, the number dropped to only 78 on analysing the calendars. This significant difference is probably due to the fact that the girls are unable to differentiate whether the pain associated with menses is a part of dysmenorrhoea or premenstrual syndrome. It is important for girls to differentiate between the two symptoms as the causes and treatment modalities for both differ significantly. The pain if associated with menses may be primary or secondary dysmenorrhoea and thus the treatment for the two will differ and hence, identification of the cause is important. Also, premenstrual pain maybe due to a variety of reasons or sometimes both may be physiological. Thus, a menstrual calendar is needed for this purpose in order to identify correctly the timing of the symptoms and decide the further course of action for investigations or treatment as required.

Besides the conventional and pharmaceutical coping mechanisms used for dysmenorrhoea and PMS, the girls have reports to using a number of

other household remedies to cope with the menstrual symptoms and pain. These include use of diet modifications, yoga, Carom seeds in water, camphor water etc. for dysmenorrhoea. For PMS symptoms, lifestyle modifications for psychological symptoms, increased hydration and water intake, coconut water, dietary changes, omega 3 fatty acids etc. for other symptoms has been reported. However, there is no evidence showing the efficacy of these remedies to relieve the symptoms. Further research is needed for the same to test the feasibility and efficacy of these measures in conquering these menstrual symptoms.

Conclusion:

This study thus shows the high prevalence of premenstrual syndrome as a common problem faced by majority of college going girls and also

affects their daily lives. It has also shown that they are well aware about the problem. Also, the menstrual calendar has been an effective tool to identify the problems of PMS and has revealed that the girls are unable to identify symptoms of pain as a problem of PMS or dysmenorrhea. There is a recall bias in the reporting of the pain symptom with many girls reporting PMS as dysmenorrhoea. The menstrual calendar can be used as an effective tool to accurately collect data regarding these symptoms.

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