Premenstrual syndrome in Anand District, Gujarat: A cross-sectional survey

Shruti V. Kamat[1], Archana Nimbalkar[2], Ajay G. Phatak[2], Somashekhar M. Nimbalkar[1,3]

Departments of [1]Paediatrics and [2]Physiology, Pramukhswami Medical College, [3]Central Research Services, Charutar Arogya Mandal, Karamsad, Gujarat, India

ABSTRACT

Aim of Study: We assessed the prevalence and severity of premenstrual syndrome (PMS) in adolescents and identified probable associations of PMS and premenstrual dysphoric disorder (PMDD) with age, locality, food habits, obesity, stress, genetic influence, menorrhagia and dysmenorrhoea. **Methods:** Cross-sectional study in schools of Anand District in State of Gujarat, India. We conducted the study in 1702 girls in the age group of 8–23 years who had achieved menarche. **Main Outcome Measures:** Prevalence of PMS and PMDD using the self-administered Premenstrual Symptoms Screening Tool for Adolescents (PSST-A). **Results:** The prevalence of moderate to severe PMS was 19.3% and PMDD was 4.6%. Almost all (94.8%) girls had at least one PMS symptom with 65.7% having moderate to severe symptoms. We found dysmenorrhoea in 71.2% girls and menorrhagia in 15.2%. Physical symptoms were reported by 53.5%, disruption of daily activities by 41.7%, while 25.1% had to miss school/college. Majority (81.3%) felt that PMS was a normal part of menstruation and 53.0% reported moderate to severe stress. Multivariate logistic regression model revealed older age, dysmenorrhoea, menorrhagia, high levels of stress and PMS in mother to be significantly associated with PMS. In addition to these, lower age at menarche and junk food significantly contributed to PMDD. **Conclusion:** Prevalence of moderate to severe PMS and PMDD in this population falls within the range reported elsewhere. PMS/PMDD affects the lives of many, significantly reducing their efficiency and worsening the quality of life.

Keywords: Adolescents, premenstrual dysphoric disorder, premenstrual syndrome, Premenstrual symptoms screening tool for adolescents

Introduction

Premenstrual syndrome (PMS) has been described as 'a condition which manifests with an array of predictable physical, emotional, cognitive, affective and behavioural symptoms, in the absence of organic or underlying psychiatric disease, that occur cyclically during the luteal phase of the menstrual cycle and resolve quickly at or within a few days of the onset of menstruation.'[1-3] PMS or premenstrual dysphoric disorder (PMDD) affects daily functioning and the disability-adjusted life years (DALY) lost because of it are comparable to those of major recognised diseases.[4,5]

Family physicians play a vital role in the diagnosis and management of PMS. Patients usually present in the outpatient setting to familiar doctors that they are comfortable discussing menstrual issues with. Family physicians need to be able to diagnose moderate to severe PMS and PMDD that may benefit from clinical interventions. They play an essential role in educating patients about PMS, PMDD, dysmenorrhoea, menorrhagia and how menstrual problems may affect their lives.

The prevalence of PMS ranges from 5.3 to 31%, and that of PMDD ranges from 1.2 to 8.3% in females of reproductive age group.[4,6-10] Patients with PMS have reported as many as 300 different PMS symptoms.[4] Majority of women, i.e., 63.1–96%, suffer from at least one premenstrual symptom.[3,6,9,11-13]

Address for correspondence: Dr. Somashekhar M. Nimbalkar, Department of Pediatrics, Pramukhswami Medical College, Karamsad, Gujarat, India. E-mail: somu_somu@yahoo.com

How to cite this article: Kamat SV, Nimbalkar A, Phatak AG, Nimbalkar SM. Premenstrual syndrome in Anand District, Gujarat: A cross-sectional survey. J Family Med Prim Care 2019;8:640-7.

Considerable variation is observed in the prevalence of PMS identified in different studies,[4,6-10] the reason being that there is no specific definition of PMS yet and those laid down continue to alter with different bodies.[3] The varied results may not only be because of difference in ethnicity, geographical location and cultural backgrounds, but also due to numerous diagnostic criteria used for PMS and PMDD,[3,14,15] such as the Daily Record of Severity of Problems (DRSP) by DSM-IV (1994),[16,17] and Premenstrual Symptoms Screening Tool (PSST).[15]

Of these various diagnostic criteria, Daily Record of Severity of Problems (DRSP), American College of Obstetrics and Gynecology (ACOG) criteria and PSST/PSST-A are validated tools and are found reliable in number of studies.[5,9,15,18-23]

PSST modified for adolescents (PSST-A), a modified form of PSST, is a fast, reliable and better tool for screening and is specially tailored for diagnosing PMS and PMDD in the adolescent age group.[5]

We sought to determine prevalence, severity, frequency and variations of symptoms of PMS and PMDD, and factors associated with them in adolescents of Anand, Gujarat. The study was approved by the institutional ethics committee.

Methods

The study was conducted in three schools, three colleges and a girl's hostel of Anand, Gujarat, India among girls aged 10–23 years. Those who had not reached menarche, under any kind of medication for more than a month, suffering from a psychiatric disease or suffering from any acute or chronic disease or disorder (and those who were ill at that moment because of any reason) were excluded. Participants filled a questionnaire consisting of demographic details, menstrual history and the PSST-A. The participants' heights and weights were measured using standard equipment. The presence and severity of PMS symptoms and the diagnosis of moderate to severe PMS and PMDD were made on the basis of the PSST-A.

Statistical analysis

Descriptive statistics [mean standard deviation (SD), frequency (%)] were used to depict the baseline characteristics and clinical profile of the study population. The associations at the univariate level were determined by the Chi-square/*t*-test. A multivariable logistic regression model (with backward LR method) was generated to understand the individual contribution of different variables on PMS and PMDD.

Results

A total of 1702 adolescents participated, of which 1281 had filled the PSST-A completely without any missing data. Analysis of frequencies and distribution of PMS symptoms and other factors were calculated out of 1702 participants, whereas the entire analysis including prevalence of PMS and PMDD and the

factors associated with them was carried out on the remaining 1281 participants.

The following results are out of 1702 participants. The participants were adolescent girls from 8 to 23 years with the mean age of 17.60 ± 2.72 years. Out of 1634 girls who filled their ages, 0.1% were from 8–11 years, 5% from 11–13 years, 13% from 13–15 years, 13% from 15–17 years, 24% from 17–19 years, 36% from 19–21 years and 10% were 21 years and above. About 99.5% were single, the rest 0.5% were married with no widows or divorcees. There were 44% from urban areas, 46% from semi-urban areas, 8% belonged to rural areas and 2% came from city slums. Nuclear families comprised 71%. Mean weight was 51 ± 10 kg. Mean height was 156 ± 6 cm. The mean body mass index (BMI) was 21 ± 4.

The mean age at menarche was 13 ± 1 year. The mean duration of menstrual cycle was 30 ± 6 days. The mean number of menstruation days was 5 ± 1 day. The age of menarche varied from 8–18 years with commonest (31%) being 13 years of age followed by 14 years (22%), 12 years (20%), 15 years (13%) and 11 years (8%). Majority of girls, i.e., 93% attained menarche from 11 to 15 years. About 72% of girls had regular menstrual cycles and 28% had irregular ones.

Out of all, 71% complained of pain during menstruation. Of those with pain, in 74% pain ceased as their menses progressed and in 84% pain began before or along with menstruation. Lower abdominal pain was seen in 72% with 22% having severe to very severe pain, while 59% had back pain with 14% having severe to very severe pain. Thigh pain was seen in 32% with 5% having severe to very severe pain, 46% had leg pain with 9% having severe to very severe pain and 19% had pain in the genital region. Overall 96% of girls had pain only in these areas. Most (65%) had moderate amount of blood loss. About 14% had heavy and 2% reported very heavy blood loss due to menstruation, whereas 2% had scanty and 18% had mild blood loss.

We found 71% girls had dysmenorrhoea and 15% had menorrhagia. Our findings showed that 95% participants had at least one PMS symptom, 90% had more than one PMS symptom and 66% had at least one moderate to severe PMS symptom.

A significant number of girls had physical symptoms as a part of their PMS as follows: 19% reported headache, 48% reported fatigue, 8% reported weight gain from fluid retention, 17% reported abdominal bloating, 7% reported breast tenderness, 40% reported acne flare-ups, 9% reported constipation or diarrhoea, 14% reported changes in skin or hair and 24% reported joint pain. Fatigue followed by acne was the commonest physical symptom.

Every cycle 28% of girls presented with physical symptoms, whereas 28% got symptomatic on most occasions and 26% became symptomatic sometimes. While 83% girls could tolerate

these symptoms, 8% had symptoms of severe intensity and 2% had symptoms of very severe intensity.

For 42% PMS disrupted their day-to-day activities and 25% had to miss school/college due to PMS. A large majority of 81% perceived PMS to be a normal part of menstruation. There were 42% of girls who consumed junk food, 45% salty food, 47% took tea or coffee and only 0.9% partake alcohol.

Girls experiencing stress in their lives were 89% with 13% having a lot of stress and 40% having moderate amount of stress. The most frequent significant factor causing stress was exams (60%), followed by studies (59%). Other significant causes of stress in these girls were health (14%), personal relationships (13%), work place stress (6%) and financial problems (3%).

The following results and analysis is out of 1281 participants who filled the complete data as per the instructions in the PSST-A questionnaire. Prevalence of PMS was found to be 19% and prevalence of PMDD was found to be 5%. About 96% had at least one PMS symptom among these 1281 girls.

As shown in Figure 1, irrespective of the severity, common symptoms were fatigue or lack of energy (70%), anger or irritability (69%) and decreased interest in work activity (68%). Insomnia (24%), feeling overwhelmed/out of control (25%) and overeating/food cravings (28%) were less common. Among the moderate to severe PMS symptoms, anger or irritability (37%) was commonest while fatigue or lack of energy (34%), decreased interest in work activity (28%), decreased interest in home activity (26%) and decreased interest in social activity (24%) also being common.

Physical symptoms were seen in 54%, of which 67% had mild intensity physical symptoms as per the PSST-A.

All moderate to severe PMS symptoms were more common in the PMDD group than the 'moderate to severe PMS' group and similarly more common in the 'moderate to severe PMS' group than the 'none to mild PMS' group. When moderate to severe
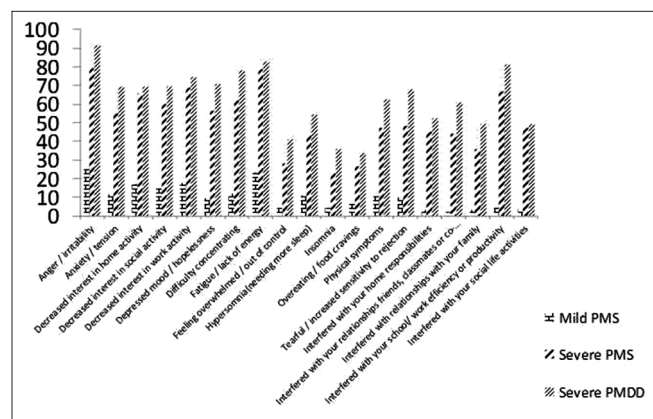
symptoms were calculated for the three groups, anger/irritability ranked highest with 92% and 79% in PMDD and clinically diagnosed PMS groups, respectively, and 26% in none/mild PMS group. Fatigue was 83%, 79% and 24% in PMDD, PMS and none/mild PMS groups, respectively. In the PMDD group 78% had difficulty concentrating, whereas only 62% and 12% in PMS and none/mild PMS groups, respectively. This was followed by decreased interest in work activity and then by depressed mood/hopelessness which was also more significant in the PMDD (71%) than the other two groups. Symptoms like decreased interest in other activities and anxiety/tension also ranked high at 70% in the PMDD group. The functional item reported most frequently as moderate or severe was 'interference with school/work efficiency or productivity' with 81%, 67% and 5% in the PMDD, PMS and none/mild PMS groups, respectively, followed by 'interference with relationships with friends, classmates or co-workers' (61%, 44% and 2%, respectively) and 'interference with home responsibilities' (53%, 45% and 3%, respectively).

From the list below, 88% reported at least one physical symptom. However according to PSST-A, only 54% reported that they experienced physical symptoms (mild/moderate/severe) as a part of their PMS with 63% and 47% of those in the PMDD and PMS groups, respectively, having moderate to severe physical symptoms.

Physical symptoms in 1281 girls were as follows: headache (21%), fatigue (49%), weight gain from fluid retention (8%), abdominal bloating (17%), breast tenderness (8%), acne flare-ups (43%), constipation or diarrhoea (10%), changes in skin or hair (14%) and joint pain (25%).

It was found that as the number of physical symptoms in a girl (out of the total nine symptoms mentioned above) increased the likelihood of her having PMS/PMDD also increased. In the category of girls having no physical symptoms only 5% had PMS. For the number of physical symptoms from 1 to 6, the percentage of PMS in these categories were found to be 10%, 16%, 29%, 40%, 52% and 77%, respectively. Only 1–2 had 8/9 physical symptoms and they had PMS/PMDD (100%).

As shown in Figure 2, there is more disruption of daily activities, more absenteeism in school/college, more menorrhagia and more chances of menstrual abnormality in mother in cases of PMDD as compared to PMS and similarly more in the PMS
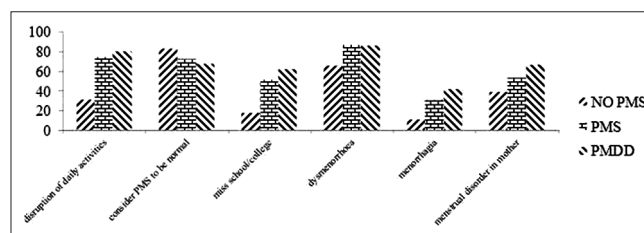

Figure 1: Symptoms of premenstrual syndrome and premenstrual dysphoric disorder

Figure 2: Disruption in daily activities

group as compared to 'no PMS' group. Dysmenorrhoea in PMS and PMDD groups appears to be almost the same, but is definitely more than the 'no PMS' group. Ironically, more girls from the 'no PMS' group consider PMS to be a normal part of menstruation than girls from the PMS group and again more than the girls from the PMDD group.

Table 1 shows the distribution of PMS and PMDD in different levels of stress experienced by the adolescent girls. The most striking figure is that there are no PMDD cases in those who do not have any stress. On the other end, there are 42% of PMDD cases in those experiencing a lot of stress. Also, there are 2% PMS cases in those suffering a lot of stress, whereas only 4%

PMS cases in those having no stress at all. Univariate analysis using independent sample *t*-test revealed that age is significantly associated with PMS ($P < 0.001$) and is shown in Figure 3.

Univariate analysis using the Chi-square test revealed that locality ($P = 0.003$), amount of blood loss ($P \leq 0.0001$), dysmenorrhoea ($P \leq 0.0001$), menorrhagia ($P \leq 0.0001$), considering PMS to be a normal part of menstruation ($P \leq 0.0001$), absenteeism from school or college ($P \leq 0.0001$), disruption of

Table 1: Stress experienced by the adolescents

	A lot	Somewhat	Nominal	Not at all
PMS	24.5	44.9	26.5	4.1
NO PMS	9.6	39.9	38.2	12.3
PMDD	42.4	40.7	16.9	0.0
NO PMDD	11.0	40.9	36.8	11.2

Figure 3: Age association with premenstrual syndrome – univariate analysis

Table 2: Logistic Regression: Factors associated with PMS

Associated variables		*P*	OR	95% CI for OR	
				Lower	Upper
Age		<0.0001	1.150	1.072	1.234
Dysmenorrhoea	Yes	<0.0001	2.869	1.660	4.958
	No (reference category)				
Menorrhoea	Yes	0.001	2.087	1.374	3.168
	No (reference category)				
Mother PMS history	Yes	0.020	1.525	1.069	2.174
	No (reference category)				
Thighs	Upto moderate (reference category)				
	Severe and very severe	0.001	3.147	1.597	6.202
Stress experienced in daily life		<0.0001			
	A lot	<0.0001	3.314	1.983	5.539
	Somewhat	0.119	1.369	0.922	2.034
	Nominal/no (reference category)				

Table 3: Logistic Regression: Factor associated with PMDD

Associated variables		*P*	OR	95% CI for OR	
				Lower	Upper
Age		0.003	1.250	1.080	1.447
Age of menarche		0.088	0.793	0.608	1.035
Menorrhoea	Yes	0.001	3.196	1.594	6.408
	No (reference category)				
Mother PMS history	Yes	0.016	2.372	1.173	4.796
	No (reference category)				
Junk food	Upto moderate (reference category)				
	Severe and Very severe	0.004	2.810	1.382	5.712
Stress experienced in daily life		<0.0001			
	A lot	<0.0001	5.677	2.260	14.262
	Somewhat	0.521	1.342	0.546	3.298
	Nominal/no (reference category)				

day-to-day activities ($P \leq 0.0001$), stress experienced in daily life ($P \leq 0.0001$), lower abdomen pain ($P \leq 0.0001$), thigh pain ($P \leq 0.0001$), pain in genitalia ($P \leq 0.0001$), consumption of junk food ($P = 0.042$) and consumption of tea or coffee ($P = 0.011$) are significantly associated with PMS.

Univariate logistic model revealed that age, dysmenorrhoea, menorrhagia, PMS and abnormal menstrual history in mother, pain in thighs, stress experienced in daily life, lower abdomen pain, consumption of tea/coffee and junk food are significantly associated with PMS (<0.05).

The multivariable logistic model revealed that age [odds ratio (OR) = 1.150, 95% confidence interval (CI): 1.072, 1.234, $P \leq 0.0001$), pain in thighs (OR = 3.147, 95% CI: 1.597, 6.202, $P = 0.001$), dysmenorrhoea (OR = 2.869, 95% CI: 1.660, 4.958, $P \leq 0.0001$), menorrhagia (OR = 2.087, 95% CI: 1.374, 3.168, $P = 0.001$), PMS and abnormal menstrual history in mother (OR = 1.525, 95% CI: 1.069, 2.174, $P = 0.020$) and stress (a lot of stress) (OR = 3.314, 95% CI: 1.983, 5.539, $P \leq 0.0001$) are significantly associated with PMS [Table 2].

The predictive value of the model was very good with 82% correct classification rate. The Nagelkerke coefficient of determination was 0.201. Univariate logistic model revealed that age, BMI, dysmenorrhoea, menorrhagia, PMS and abnormal menstrual history in mother, pain in thighs, stress experienced in daily life, lower abdomen pain, consumption of junk food are significantly associated with PMDD (<0.05) [Table 3].

The logistic model revealed that age (OR = 1.250, 95% CI: 1.080, 1.447, $P = 0.003$), consumption of junk food (OR = 2.810, 95% CI: 1.382, 5.712, $P = 0.004$), age of menarche (OR = 0.793, 95% CI: 0.608, 1.035, $P = 0.088$), menorrhagia (OR = 3.196, 95% CI: 1.594, 6.408, $P = 0.001$), PMS and abnormal menstrual history in mother (OR = 2.372, 95% CI: 1.173, 4.796, $P = 0.016$) and stress (a lot of stress) (OR = 5.677, 95% CI: 2.260, 14.262, $P \leq 0.0001$) are significantly associated with PMDD.

The predictive value of the model was very good with 95% correct classification rate. The Nagelkerke coefficient of determination was 0.244. The stress experienced in daily life is associated with menorrhagia and dysmenorrhoea (P value ≤ 0.0001). There is low negative correlation between age of menarche and BMI ($r = -0.117$ for 1702 cases and $r = -0.124$ for 1281 cases).

Discussion

This study presents findings from a large sample size of adolescent and young adults and across disciplines that has not been conducted in India before. It corroborates much of the previous literature. Understanding PMS is important for family physicians as appropriate management strategies are available. A healthy lifestyle including stress reduction, balanced diet,

regular exercise and sleep pattern can alleviate PMS symptoms in many patients. Selective serotonin reuptake inhibitors have shown clinical improvement in PMS and PMDD cases in various research studies.

The prevalence of moderate to severe PMS (19.3%) and PMDD (4.6%) is consistent with the reported range of 3–31% for PMS and 3–8% for PMDD.[1,5,24] Our prevalence rates are higher than those reported from Japan[8] (2.6% PMDD and 11.8% moderate–severe PMS), Spain[18] (1.1% PMDD and 8.9% PMS), Poland[20] (2.1% PMDD) and Switzerland[9] (3.1% PMDD, 10.3% PMS), but lower than those reported from USA and Canada[5] (8.3% PMDD and 21.3% PMS). Studies from China[25] (2.1% PMDD and 21.1% PMS), USA and Nigeria[19] (4.1% PMDD and 14.5% PMS) had rates similar to ours.

We observed that girls with PMS or PMDD reported more severe PMS symptoms, more physical symptoms, more interference of symptoms with daily functioning, low tolerance of symptoms, more prevalence of dysmenorrhoea and menorrhagia and higher level of stress.

Almost 95% participants had premenstrual symptoms keeping with other studies.[6,9,13] Similar to other studies in adolescents,[5,12,13] anger or irritability (36.5%) was the commonest (moderate–severe) symptom but followed by fatigue or lack of energy (34.3%) and by decreased interest in work activity (27.7%). Steiner's study[5] had tearfulness/increased sensitivity to rejection and physical symptoms ranking after anger in terms of frequency. The most frequent functional item reported (moderate–severe) was interference with school/work efficiency/productivity followed by interference with relationships with friends, classmates/co-workers and then with home responsibilities.

Physical symptoms are observed more in the PMDD group (63%) and the 'moderate to severe PMS' group (47%) compared to the 'none to mild PMS' group (11%) similar to the study by Steiner *et al.*,[5] although our participants (PMS and PMDD groups) had less frequency of these symptoms compared to Steiner's study.

We found univariate association of locality with PMS using the Chi-square test ($P = 0.003$) as seen in other studies.[21] Also individual characteristics such as level of education,[20] type of work and work environment, people they stay and work with and psychology of the person can influence the reporting and diagnosis.

A French population study shows 72% fluctuation in PMS status among women having PMS,[7] which could support the theory of high intra-individual and inter-individual variation of PMS symptoms and their severity. This study demonstrated that PMS is a chronic intermittent disabling condition which often disrupts normal functioning and causes a negative impact, rather a burden in daily lives.[5,7]

We found the association of older age with PMS ($P \leq 0.0001$) and PMDD ($P = 0.003$) as seen earlier.[21,23,26] This is due to the fact that ovulatory cycles are common during and just after menarche. We did not find significant association of PMS with regular cycles unlike other studies.[21] Cyclic ovarian activity is essential for the occurrence of PMS as PMS is absent before puberty, during pregnancy and after menopause and diminished or eliminated by measures suppressing ovulation or the cycle.[1,27] The association of lower age at menarche with PMDD ($P = 0.088$) also found elsewhere[21] indicates that girls achieving ovulatory cycles early are more likely to have PMDD. As opposed to a Japanese study,[8] our results show lower prevalence of PMS and PMDD in teenage (<18 years) girls compared to those who were 18 years and above. Physical symptoms are also lower than that of older women, which may not be comparable to the adult group.

The association of dysmenorrhoea and menorrhagia and high stress to both PMS and PMDD, and consumption of junk food to PMDD, suggest the probable effects of lifestyle on premenstrual disorders.

Menorrhagia was common (15.2%) and associated with PMS as well as PMDD, the probable reason being that those having prolonged menstruation or/and excessive bleeding may be more apprehensive about menstruation in the premenstrual phase leading to their menses.[7]

Stress was strongly associated with both PMS and PMDD (both with $P < 0.0001$) and is similar to earlier published work showing strong association of both with poor physical health and psychological distress.[9] Each amplifies the other possibly with multiplicative effects or may even be responsible for causing the other. Stress was also strongly associated both to dysmenorrhoea and menorrhagia ($P < 0.0001$) and may further aggravate PMS symptoms through these.

We found a univariate association of BMI with PMDD, but not with PMS, which could reflect that more amount of fat is a risk factor for PMDD. Menstrual problems are more likely in the obese or overweight[28] and can be understood by food cravings in the premenstrual phase. It is suggested that PMS can be prevented by maintaining a healthy body mass.[29] The low negative correlation of BMI with age of menarche ($r = -0.12$) may mean that obese girls may achieve menarche early and get PMS earlier than others.

We found a high prevalence of dysmenorrhoea (71.2%), a finding consistent with many previous studies in adolescents.[11,13,30] The strong association of dysmenorrhoea with PMS and PMDD is similar to other studies.[12,23] Pain could be the most probable reason as to why students had to miss school/college as found by others.[13,26] We found association between dysmenorrhoea and absenteeism in school/college ($P < 0.0001$). Out of all those who had dysmenorrhoea 30.4% remained absent and out of all those remaining absent 89% suffered dysmenorrhoea. We found menstrual-related pain to be associated with PMS ($P \leq 0.0001$), a finding also observed by Steiner *et al.*[5]

Unlike PMS, we did not find association of dysmenorrhoea with age ($P = 0.14$). However, there was a strong association of dysmenorrhoea with interference with school/work efficiency/productivity ($P < 0.0001$), interference with relationships with friends/classmates ($P \leq 0.001$) and with family ($P \leq 0.045$), interference with social activities ($P < 0.0001$) and home responsibilities ($P < 0.0001$).

The association of 'PMS or menstrual abnormality in mother' with PMS ($P = 0.020$) and PMDD ($P = 0.016$) consistent with studies[21] might indicate to a genetic cause for PMS/PMDD.

Our finding that PMDD (but not PMS) was associated with consumption of junk food ($P = 0.004$) reveals that unhealthy diet can aggravate the symptoms of PMS to cause disability that characterises PMDD. Reports suggest prevention and treatment of PMS with lifestyle changes like dietary and aerobic exercise,[31] educational programmes and cognitive-behavioural therapy (CBT).[24]

The study reveals that about 81% of the participants believed PMS to be a normal part of menstruation. This prevalent belief about PMS being 'normal' is supported by the finding that 95% of the participants suffer from at least one PMS symptom and fall under the mild PMS category. The perception of PMS being 'normal' was comparatively less in those having PMS and even lesser in the PMDD group. It is possible that girls with many symptoms, more frequent and severe symptoms will perceive the problem to be much greater than those who do not.

The implications of the study are relevant to the practice of primary care in the sense that family physicians are the first ones to encounter menstrual problems and PMS symptoms. They can identify patients with early menarche, dysmenorrhea, menorrhagia, PMS and PMDD and look for positive family history of PMS or menstrual problems, higher levels of stress, higher BMI and increased consumption of junk food, tea and coffee. They can educate the patients on these associations and how lifestyle changes can improve their condition. They can identify distress and functional impairment caused by dysmenorrhoea, menorrhagia and physical symptoms of PMS/PMDD. Family physicians are crucial in spreading awareness on these menstrual problems, diagnosing with the PSST-A tool and educating patients on PMS, PMDD and how they might affect their day-to-day lives. They can recommend keeping a PMS diary for diagnosis, weight reduction in obese patients, reducing stress and junk food consumption and a regular exercise regimen. They can prescribe medication for dysmenorrhoea and menorrhagia and refer for further investigation. They may refer PMDD cases to psychiatry for pharmacotherapy and CBT.

Limitations

We used PSSTa-A questionnaire instead of the DRSP that is used to diagnose PMS/PMDD for a period of two consecutive symptomatic cycles. Being a retrospective study, it may amplify or attenuate symptoms based on personal characteristics of the participant (extrovert or introvert, respectively).

Study did not assess physical and psychiatric illnesses that the girls might have, which could affect or/and lead to the causation of PMS/PMDD or alter their perception, description or/and accounting of premenstrual symptoms.

Author Contributions

Shruti V. Kamat initiated and conceived the research study, contributed to design, acquisition of data, analysis and interpretation of data, drafting and revising the article and final approval of the version to be published. Somashekhar M. Nimbalkar contributed to design, data collection, analysis and interpretation of data, revising the article and final approval of the version to be published. Archana Nimbalkar contributed to design, data collection, analysis and interpretation of data and final approval of the manuscript. Ajay G. Phatak contributed to design, data analysis and interpretation of data, revising the article and final approval of the manuscript. Somashekhar M Nimbalkar will be the guarantor of the study.

Conflicts of interest

There are no conflicts of interest.

References

1. Gynaecologists RCOG. Management of premenstrual syndrome. Green-top Guideline no. 48. BJOG 2017;124:e73-105.
2. Hofmeister S, Bodden S. Premenstrual syndrome and premenstrual dysphoric disorder. Am Fam Physician 2016;94:236-40.
3. Rapkin AJ, Mikacich JA. Premenstrual dysphoric disorder and severe premenstrual syndrome in adolescents. Paediatr Drugs 2013;15:191-202.
4. Halbreich U, Borenstein J, Pearlstein T, Kahn LS. The prevalence, impairment, impact, and burden of premenstrual dysphoric disorder (PMS/PMDD). Psychoneuroendocrinology 2003;28:1-23.
5. Steiner M, Peer M, Palova E, Freeman E, Macdougall M, Soares CN. The Premenstrual Symptoms Screening Tool revised for adolescents (PSST-A): Prevalence of severe PMS and premenstrual dysphoric disorder in adolescents. Arch Womens Ment Health 2011;14:77-81.
6. Takeda T, Tasaka K, Sakata M, Murata Y. Prevalence of premenstrual syndrome and premenstrual dysphoric disorder in Japanese women. Arch Womens Ment Health 2006;9:209-12.
7. Potter J, Bouyer J, Trussell J, Moreau C. Premenstrual syndrome prevalence and fluctuation over time: Results from a French population-based survey. J Womens Health (Larchmt) 2009;18:31-9.
8. Takeda T, Koga S, Yaegashi N. Prevalence of premenstrual syndrome and premenstrual dysphoric disorder in Japanese high school students. Arch Womens Ment Health 2010;13:535-7.
9. Tschudin S, Bertea PC, Zemp E. Prevalence and predictors of premenstrual syndrome and premenstrual dysphoric disorder in a population-based sample. Arch Womens Ment Health 2010;3:485-94.
10. Chandraratne NK, Gunawardena NS. Premenstrual syndrome: The experience from a sample of Sri Lankan adolescents. J Pediatr Adolesc Gynecol 2011;24:304-10.
11. Sharma P, Malhotra C, Taneja DK, Saha R. Problems related to menstruation amongst adolescent girls. Indian J Pediatr 2008;75:125-9.
12. Osman OT, Sabri S, Zoubeidi T, Alharbi AI, Rizk D, Narchi H, *et al.* Prevalence, severity, and correlates of premenstrual dysphoric disorder symptoms among women in the Arabian Peninsula. Prim Care Companion CNS Disord 2017;19. pii: 17m02112. doi: 10.4088/PCC.17m02112.
13. Parker MA, Sneddon AE, Arbon P. The menstrual disorder of teenagers (MDOT) study: Determining typical menstrual patterns and menstrual disturbance in a large population-based study of Australian teenagers. BJOG 2010;117:185-92.
14. Freeman EW. Premenstrual syndrome and premenstrual dysphoric disorder: Definitions and diagnosis. Psychoneuroendocrinology 2003;28:25-37.
15. Steiner M, Macdougall M, Brown E. The premenstrual symptoms screening tool (PSST) for clinicians. Arch Womens Ment Health 2003;6:203-9.
16. Endicott J, Nee J, Harrison W. Daily Record of Severity of Problems (DRSP): Reliability and validity. Arch Womens Ment Health 2006;9:41-9.
17. Borenstein JE, Dean BB, Yonkers KA, Endicott J. Using the daily record of severity of problems as a screening instrument for premenstrual syndrome. Obstet Gynecol 2007;109:1068-75.
18. Dueñas JL, Lete I, Bermejo R, Arbat A, Pérez-Campos E, Martínez-Salmeán J, *et al.* Prevalence of premenstrual syndrome and premenstrual dysphoric disorder in a representative cohort of Spanish women of fertile age. Eur J Obstet Gynecol Reprod Biol 2011;156:72-7.
19. Ogebe O, Abdulmalik J, Bello-Mojeed MA, Holder N, Jones HA, Ogun OO, *et al.* A comparison of the prevalence of premenstrual dysphoric disorder and comorbidities among adolescents in the United States of America and Nigeria. J Pediatr Adolesc Gynecol 2011;24:397-403.
20. Skrzypulec-Plinta V, Drosdzol A, Nowosielski K, Plinta R. The complexity of premenstrual dysphoric disorder--risk factors in the population of Polish women. Reprod Biol Endocrinol 2010;8:141.
21. Balaha MH, Monem MA, Moghannum MS, Muhaidab NS. The phenomenology of premenstrual syndrome in female medical students: A cross sectional study. Pan Afr Med J 2010;5:4.
22. Gehlert S, Song IH, Chang CH. The prevalence of premenstrual dysphoric disorder in a randomly selected group of urban and rural women. Psychol Med 2009;39:129-36.

23. Adewuya, AO, Loto OM, Adewumi TA. Premenstrual dysphoric disorder amongst Nigerian university students: Prevalence, comorbid conditions, and correlates. Arch Womens Ment Health 2008;11:13-8.

24. Rapkin AJ, Mikacich JA. Premenstrual syndrome and premenstrual dysphoric disorder in adolescents. Curr Opin Obstet Gynecol 2008;20:455-63.

25. Qiao M, Zhang H, Liu H, Luo S, Wang T, Zhang J, *et al.* Prevalence of premenstrual syndrome and premenstrual dysphoric disorder in a population-based sample in China. Eur J Obstet Gynecol Reprod Biol 2012;162:83-6.

26. Nwankwo TO, Aniebue UU, Aniebue PN. Menstrual disorders in adolescent school girls in Enugu, Nigeria. J Pediatr Adolesc Gynecol 2010;23:358-63.

27. O'Brien PM, Backstro T, Brown C. Towards a consensus on diagnostic criteria, measurement and trial design of the premenstrual disorders: The ISPMD Montreal consensus. Arch Womens Ment Health 2011;14:13-21.

28. Strine TW, Chapman DP, Ahluwalia IB. Menstrual-related problems and psychological distress among women in the United States. J Womens Health (Larchmt) 2005;14:316-23.

29. Bertone-Johnson ER, Hankinson SE, Willett WC, Johnson SR, Manson JE. Adiposity and the development of premenstrual syndrome. J Womens Health (Larchmt) 2010;19:1955-62.

30. Bakhshani NM, Hosseinbor M, Shahraki Z, Sakhavar N. Premenstrual syndrome symptomatology among married women of fertile age based on methods of contraception (hormonal versus non-hormonal methods of contraception).

31. Dell DL. Premenstrual syndrome, premenstrual dysphoric disorder, and premenstrual exacerbation of another disorder. Clin Obstet Gynecol 2004;47:568-75.