Original Article

Premenstrual symptoms in Pakistani women and their effect on activities of daily life

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Abstract

Objective: To study the prevalence of Premenstrual symptoms in Pakistani women aged 15 to 49 years, and to determine the effects of the symptoms on activities of daily life and treatment sought for them.

Methods: This study was cross sectional, population based using a questionnaire of 402 women from Karachi, Lahore and Islamabad. A checklist of 23 premenstrual symptoms, socio-demographic factors and lifestyle variables was used. Statistical analysis was done with SAS and R statistical packages.

Results: Majority 98.8% of women were unaware of Premenstrual syndrome and Premenstrual dysphoric disorder. Using ICD-10 classification 79.9 % (CI: 75.6 - 83.7) of women and using American College of Obstetricians and Gynaecologists criteria, 12.7% (CI: 9.6 -16.3) had same and through DSM IV Classification 5.5% (CI: 3.5 - 8.2) had Premenstrual dysphoric disorder. There was no significant difference between the three cities.

Common symptoms were abdominal bloating, cramps, lack of energy, irritability and mood swings. The effect of PMS severity on activities of daily life was highly significant (Loglinear model, $p<.001$). Physician consultation increased with severity of PMS: 12.7% for ICD 10 PMS, 25.6% for ACOG PMS, and 40.9% for Premenstrual dysphoric disorder, ($p = 0.002$).

Conclusion: Physical symptoms predominate in the premenstrual experience of the Pakistani women in this study, and have a significant impact on their daily life activities.

Keywords: Premenstrual symptoms, Premenstrual syndrome (PMS), Premenstrual dysphoric disorder (PMDD), Activities of daily life (ADL) (JPMA 61:763; 2011).

Introduction

Premenstrual syndrome is diagnosed typically when symptoms occur before the onset of menstrual periods, and subside a few days after they start. Symptoms can be physical or psychological, and can vary in severity from mild, moderate to severe. Depending on their severity they may be incapacitating and lead to disruption of work and social life of women who are afflicted by this condition. There has been very little research on the prevalence of Premenstrual syndrome (PMS) in Pakistani women. Pakistani women are often raised thinking that PMS is part of being a woman, and they should not complain about it, rather accept it as a part of life. PMS has been defined in different ways by different organizations, and confusion exists about which to follow. The current diagnostic criteria for PMS can be based on the WHO's International Classification of diseases (ICD-10) or the American College of Obstetricians and Gynaecologists (ACOG) or the Diagnostic and Statistical Manual of Mental Disorders(DSM-IV).

WHO's ICD-10 requires one symptom to be present from a range of physical and emotional symptoms, for the diagnosis of PMS and the severity of symptoms is not specified.[1] ACOG requires for PMS, one emotional and one physical symptom to be experienced by women 5 days before menses and remit within 4 days of onset of menses, no recurrence till day 13 of the cycle, in each of the prior 3 menstrual cycles. Prospective confirmation for 2 cycles is required with identifiable dysfunction in social or economic performance.[2]

DSM-IV defines Premenstrual dysphoric disorder (PMDD) as a separate entity: premenstrual symptoms must occur in the last week before menses and remit within a few days of the onset of menses; they must also be severe enough to interfere with work, family and social relationships; at least 5 symptoms (including at least one major dysphoric symptom out of a list of 11 must be present in the majority of last 12 cycles. Symptoms must be confirmed prospectively by daily monitoring of at least 2 menstrual cycles, and cannot be an exacerbation of another disorder.[3]

There exists very little population based data from Pakistan regarding the prevalence of PMS and PMDD. A few studies have used convenience sampling of medical students and other groups of women from major cities in Pakistan.[4-6] However, because of convenience sampling they remain biased. Despite the bias however, these and other Asian studies report that a significant proportion of Asian women

suffer from premenstrual symptoms, and therefore it is not a "western disease" as frequently perceived.[7-9]

The objective of this survey was to determine the prevalence of Premenstrual symptoms in Pakistani women and to determine the effects of the symptoms on activities of daily life (ADL), and treatment sought (physician consultation, drug treatment and satisfaction).

Materials and Methods

This is a cross sectional population based survey conducted between January and February 2008 in Pakistan, to study the prevalence of PMS symptoms in Pakistani women.

A population survey with no clinical intervention was done. Individual consent was taken prior to each interview. The initial target sample size was 400 women, to provide a precision of 5% with 95% two sided confidence at the National level. The sample size chosen was the same as that for other Asian and European countries, and based on known prevalence rates of PMDD and ACOG PMS in European countries. Four hundred and two women aged between 15 to 49 years, who had had at least 2 menstrual periods in the last 3 months were recruited from Karachi (153, 38%), Lahore (149, 37%)and Islamabad (100, 25%). These 3 cities were chosen, because they are densely populated and multi-cultural. Karachi in particular, also gives representation to rural settlers from all over Pakistan. The interviews were questionnaire based face to face, conducted in urdu, by trained female interviewers. Each interview took 30-40 minutes, and was conducted according to the ESOMAR Code of Conduct.[10]

The sampling was a two staged cluster approach, with each city first divided into clusters followed by randomly selecting clusters which would be included finally in the study. A large number of clusters with a small number of interviews in each cluster was recommended. There were 30 clusters in Karachi, 30 in Lahore and 20 in Islamabad. In each cluster the interviewer was given a predefined starting point. The interviewer alternately took left and right turns, to ensure that a random route was followed.

The interviewer went door to door and screened respondents in each household. If more than one household member met the selection criteria, then only one was selected according to the standard Kish Grid methodology.[11] The Kish Grid lists all selected respondents according to age in ascending order, and ensures that all qualified respondents have an equal chance of being selected, thus avoiding bias that some e.g housewives would be more easily recruited. Quotas were imposed on age and recruitment spread over different times of the day, on different days of the week, to minimize bias.

The number of households screened were 994, of which 755 passed the screening criteria (pass rate for screening 76%). Successful interviews were 402, Refusals were 87 (refusal rate 15%); Non-Contacts were 258; Non-Completes were 8. The completion rate was 53% (number who completed interview/ number who passed the screening criteria).

The main socio-demographic factors studied were: age, education, marital status, job, parity, lifestyle, smoking habits, age at first PMS and oral contraceptive use (Table-1).

The questionnaire incorporated all symptoms listed by the current classificatory systems and enabled us to calculate an approximate prevalence for the ICD-10, ACOG and DSM-IV criteria for PMS and PMDD. Each woman was asked about symptom experience using a checklist of 23 symptoms. They were specifically asked about symptoms that occurred in the days preceding the periods and dissipated after the periods started. Those women who reported such symptoms were further asked to classify symptom severity into mild, moderate or severe (0=No, Mild, Moderate, Severe=3).

The duration of symptoms (during how many menstrual cycles in the last 12 cycles did she experience that symptom). The order of symptoms was also changed between interviews in each group. After a successful interview the interviewer skipped 10 houses before attempting the next interview. All interviewers (who were female) along with their field supervisors, were fully briefed on the survey objectives, respondent criteria, flow of the questionnaire, etc. Mock interviews were conducted to further familiarize the interviewers with the flow of the questionnaire. The address and telephone numbers of the respondents were also recoded and 20% of each interviewer's work was cross checked, to verify that an actual interview had taken place. Participating women did not receive any payment.

All completed questionnaires were then edited to check for consistency of answers before proceeding with data entry. Data entry was carried out by two different teams, with each team cross checking the data entered by the other team, to minimize entry errors.

For each woman, each PMS symptom was measured by its severity (0=Absent,1= Mild,2= Moderate, 3=Severe) and its duration of frequency of occurrence (number of cycles symptoms were experienced in last 12 months). The Severity and Frequency Index (SF-index) is a composite index to combine severity and frequency of a symptom into one unique measure calculated as the product of Severity by Duration and standardized to vary between 0= "No premenstrual symptom never", to 10= "all premenstrual symptoms during each cycle of the whole year".

The statistical analysis was conducted using SAS

statistical package version 9.2 and R statistical package.

Results

This study found that awareness of the terms PMS and PMDD is low in the women screened from the 3 major cities in Pakistan, 98.8% being unaware of these terms. The term PMS is more familiar than PMDD to both women and physicians.

In this paper the term "frequency" is used for the number of cycles that the woman experiences symptoms per year. The term "prevalence" of PMS as the relative frequency of women experiencing the syndrome.

The Prevalence of PMS according to the three systems was estimated with 95% Confidence Interval (CI). Eighty one (20.1%) women reported never experiencing PMS The ICD 10 and DSM-IV syndromes clearly appear as extreme classification groups. Using ICD-10 the prevalence of PMS was 79.9% (CI: 75.6 - 83.7); with DSM-IV it was 5.5%, (CI: 3.5 - 8.2): ACOG PMS constitutes a compromise between the two 12.7% (CI: 9.6 -16.3). The difference between the three cities was not significant ($p>.05$ for the three comparisons).

Table-1 lists the Socio-Demographic factors.The majority (58%) of the 402 women screened experienced PMS for the first time before age 20 years. None of the women reported that their PMS started after age 45 years.

Classification into 3 age groups, was selected by a prior statistical analysis plan: less than 25 years, 25 to 35

Table-1: Socio-demographic variables in Total 402 women.

	Karachi 153		Lahore 149		Islamabad 100		Total 402	
	Count	%	Count	%	Count	%	Count	%
Age (years)								
Less than 25	47	30.7	54	36.2	42	42	143	35.6
25-34	60	39.2	48	32.2	38	38	146	36.3
35 and more	46	30.1	47	31.5	20	20	113	28.1
Education								
Primary	47	30.7	44	29.5	44	44	135	33.6
Secondary	78	51.0	68	45.6	43	43	189	47.0
Higher	28	18.3	37	24.8	13	13	78	19.4
Marital Status								
Single	42	27.5	60	40.3	35	35	137	34.1
Married	111	72.5	89	59.7	65	65	265	65.9
Occupation								
Work	11	7.2	15	10.1	11	11	37	9.2
Housewife	123	80.4	108	72.5	73	73	304	75.6
Student	19	12.4	26	17.4	16	16	61	15.2
Parity								
0	49	32.0	61	40.9	40	40	150	37.3
1-2	37	24.2	22	14.8	24	24	83	20.6
3-4	46	30.1	33	22.1	24	24	103	25.6
More than 5	21	13.7	33	22.1	12	12	66	16.4
Sports participation/ Exercise								
No	149	97.4	137	91.9	93	93	379	94.3
Yes	4	2.6	12	8.1	7	7	23	5.7
Smoking Habits								
Non Smoker	153	100	147	98.7	100	100	400	99.5
Smoker	0	0	2	1.3	0	0	2	0.5
Age First PMS (years)								
No response	23	15.0	27	18.1	14	14	64	15.9
10:15	27	17.6	29	19.5	58	58	114	28.4
15:20	49	32	42	28.2	28	28	119	29.6
20:25	17	11.1	21	14.1	0	0	38	9.5
25:30	11	7.2	12	8.1	0	0	23	5.7
30:35	15	9.8	14	9.4	0	0	29	7.2
35:40	4	2.6	2	1.3	0	0	6	1.5
40:45	7	4.6	2	1.3	0	0	9	2.2
When in cycle								
Whole cycle	74	48.4	106	71.1	90	90	270	67.2
Only before	79	51.6	43	28.9	10	10	132	32.8
Oral Contraceptives								
Non- user	149	97.4	117	78.5	95	95	361	89.8
User	4	2.6	32	21.5	5	5	41	10.2

Table-2: Symptom Prevalence and 95%CI, Frequency (% year) and The Severity and Frequency Index (SF-Index).

	Prevalence	95%	CI	Frequency	Sf-index
Muscular pain	31.34	26.83	36.13	35.34	2.35
Lack of Energy	26.87	22.59	31.48	30.33	1.96
Confusion	16.42	12.93	20.41	23.45	1.40
Abdominal Pain	18.16	14.51	22.28	19.55	1.35
Anxiety	12.94	9.81	16.62	16.13	1.05
Headaches	14.18	10.92	17.98	16.63	1.01
Irritable	13.43	10.25	17.16	15.05	0.93
Social Withdrawal	9.95	7.20	13.30	11.24	0.81
Restless	10.45	7.63	13.86	11.94	0.77
Lack of Concentration	10.20	7.42	13.58	10.55	0.70
Appetite change	9.70	6.99	13.02	9.60	0.69
Anger	8.46	5.93	11.62	11.21	0.69
Sleep disorder	10.20	7.42	13.58	10.70	0.66
Bloating	8.71	6.14	11.90	8.83	0.65
Mood disturbance	8.71	6.14	11.90	8.69	0.61
Depressed	7.46	5.09	10.48	8.06	0.55
Tension	7.96	5.51	11.05	6.74	0.48
Swelling	6.47	4.27	9.33	5.93	0.44
No Control	4.23	2.48	6.69	4.62	0.29
Hopelessness	4.48	2.67	6.99	3.54	0.27
Weight gain	4.48	2.67	6.99	3.96	0.27
Breast Pain	3.48	1.91	5.78	3.63	0.24
Skin problems	3.98	2.29	6.38	3.42	0.23

years and 34 years and above. This classification divides the sample into three rather equal groups, knowing that 35 years is an age when some symptoms peak, and decrease afterwards.

In this study age did not seem to have a significant effect on the 3 different groups of classifications of premenstrual syndromes (ICD-10, ACOG, DSM IV-PMDD), the number of women being similar in all the three age group divisions (Proportion of Inconsistencies= 1.24% with 95% Upper value= 2.87%)

The Combined oral contraceptive pill (COCP) usage is also expected to affect PMS. There was a higher percentage of women using the COCP (21.5%) in Lahore as compared to 5% in Islamabad and 2.6% in Karachi. As the total percentage of pill users (10.2%) was so small in this study (Table-1), a comparison with non users was not made.

The 23 symptoms documented (of at least moderate severity) are shown by decreasing order of prevalence in Table-2. Physical symptoms predominate. The two most prevalent clinical symptoms noted were muscle pain and lack of energy. This is followed by confusion, abdominal pain / cramps, headaches and irritability. The rest are minor symptoms. There was no significant difference between the three cities ($p>0.05$ for the three comparisons)

Of the 51 women, who fulfilled the ACOG criteria for diagnosis, 69% reported that these symptoms affected their activities in daily life (ADL) to a mild degree, while 8 % reported that their daily life activities were severely affected.

Table-3: ADL Predicting model (Linear Model, R2=0.350, n=73).

	Co-eff	95%	CI	P value
Constant	1.108	0.053	2.162	0.042
PMS category:				<.001
No	-0.367	-0.740	0.005	
ICD 10	-0.256	-0.441	-0.070	
ACOG	0.120	-0.118	0.359	
DSM IV (PMDD)	0.503	0.229	0.776	
Age	0.118	-0.098	0.333	0.289
Education	-0.026	-0.232	0.180	0.800
Oral contraceptive use	-0.227	-0.633	0.178	0.276
Marital status	-0.189	-0.605	0.227	0.380
Lifestyle	-0.033	-0.781	0.714	0.928
Parity	-0.123	-0.353	0.107	0.301
Occupation:				0.746
Working	0.014	-0.287	0.315	
Housewife	-0.077	-0.289	0.135	
Student	0.063	-0.204	0.330	
Region:				0.106
Karachi	-0.170	-0.347	0.007	
Lahore	0.132	-0.032	0.296	
Islamabad	0.038	-0.163	0.239	

Type of activities affected were: housekeeping (88%), interaction with friends and colleagues (16%), school/ university attendance (14%), family relationships (14%), work performance (10%), sex life (4%) and free time activities (2%).

The effect of PMS severity on ADL was found to be highly significant (Log Linear model, $p<0.001$). For the whole sample, 2.5% (CI:1.2 - 4.5) were characterized by a clinically relevant impairment on ADL. However, the proportion of impaired women increased with PMS level of severity, from 0% with no PMS, 0.8% with ICD-10 PMS, 5% with ACOG PMS, and 27.3% with PMDD. Again, no significant difference was found between the three cities.

A complementary analysis was conducted (while adjusting for PMS severity), to find whether ADL is more severely affected in some subgroups of women (Table-3). Predictors with a p value <.05 allowed us to detect these subgroups. If the p values exceed p=0.05, no subgroup in particular was considered as more affected. No other significant factor was identified, except a non significant trend (p=0.106) for women of Lahore to be characterized by a more severe value of the ADL Index (+0.132 compared with the mean ADL value).

The proportion of women consulting a physician increased with severity of PMS, from 12.7%, 25.6% and 40.9% for ICD10 PMS, ACOG PMS and PMDD women, respectively (p value=0.002).

Of the 321 diagnosed PMS women, 261 (81.3%) did not use any medication to relieve their symptoms; while 56 (17.4%) used Antispasmodics or Analgesics; only 4 (1.2%) used miscellaneous medications which included herbal

preparations, homeopathic medicines, vitamins, antidepressants and combined contraceptive pill. As the PMS severity increased, they were more likely to use medication. Of the 51 women classified as PMS by ACOG, 28 (54.9%) used no medication, 21 (41%) used Anti-spasmolytics/ analgesics and 2 (3.9%) used miscellaneous medications mentioned above.

Of the 60 women using any form of medication to relieve their symptoms, 40(66.7%) were satisfied, 14 (23.3%) were very satisfied and 6 (10%) were not satisfied with their treatment.

Discussion

It has been estimated that as many as 80% of women of reproductive age may be suffering from some symptoms of PMS.[12] If the ICD-10 criteria are employed, it seems that 79.9% of women in this study were suffering from PMS. While there is very little published material on PMS and PMDD emerging from Pakistan It seems that PMS afflicts a significant number of women here.[4-6] It is difficult to compare these studies, as different symptoms and diagnostic criteria and convenience sampling has been employed; so the results cannot be generalized to the diverse population of women in Pakistan. The results of this survey concur with the results of similar surveys of European and Latin American women,[13,14] as physical symptoms predominate. The maximum prevalence of symptoms and syndromes is occurring by 35 years of age, similar to the European and Latin American women. In this study, none of the women reported that their PMS started after 45 years of age. This is not surprising, as we know this condition is prevalent in ovulatory cycles. (Women who are constitutionally predisposed to experience these symptoms in response to hormonal cycles, would have noticed these symptoms at an earlier age).

Muscle weakness and lack of energy are the commonest symptoms in this study, and are prominent common symptoms in previously published Pakistani studies as well.

Breast pain/ tenderness is not as common in this study (3.48%) as compared to previously published studies from Pakistan,[4-6] and may be due to the fact that this is not a convenience sampling study like the previously published studies.

Nisar et al interviewed 172 medical students with a prospective record of 2 menstrual cycles and found that 51% suffered from PMS (ICD-10), while 5.8 % had PMDD. Mood symptoms predominated in this study (40%-83%) as compared to physical symptoms (68%). There was great impairment in ADL in 74% of those suffering from it.

Shershah et al[5] looked at the prevalence of PMS in 1600 women from multi ethnic backgrounds in Karachi who answered a questionnaire with the help of lady school teachers and medical students, and were diagnosed to have PMS if > 3 symptoms occurred in the last 6 cycles (in each cycle prior to menses, resolved with onset of menses). This was retrospective recall of symptoms and diagnostic criteria were not of ICD-10, ACOG or DSM IV. However, with their own above definition, they found the total prevalence of PMS was 33%; it was lowest in para 1 and 0 (20.89%) and highest in para 4 and above (55.89%), and more prevalent in the lower social class (57.5% to 60.6 %); it was lower in Pathan women (11.6%) as compared to Punjabi, Mohajir, Sindhi and Baluchi women (30.6%). Majority affected by PMS were housewives (38%) and while students, doctors, nurses and teachers showed a slightly lower incidence of 27-30%. Physical symptoms predominate in this study as well. The most dominant symptoms being: lower abdominal pain, cramps, backache, breast pain, social withdrawal, anxiety/ mood change, irritability/ depression.[5] These are similar to the frequency of symptoms reported by Tabassum et al in medical students;[6] however mood symptoms predominated in this study (92.8%) while they constituted 12-19% in the earlier study.[5] Treatment sought was with vitamins, analgesics, herbal remedies and homeopathic drugs.

Tabassum et al, studied PMS frequency and severity in young college girls (384 unmarried Khyber medical College, Peshawar, students) with regular last 6 menstrual cycles. They used prospective charting of a 2 cycle 29 item form based on Menstrual distress questionnaire.[6] They found the frequency of PMS to be 53% (using ICD- 10 definition). The symptoms were mild in 42%, moderate in 18.2% and severe in 31.7% of girls with PMS; 18% had PMDD (DSM- IV) , which is significantly higher than the 5.5% PMDD found in this study; 42 % of students reported absence from work.

It is remarkable that the majority of women suffering from PMS (81.3%) in this study, used no treatment/ medication to relieve their symptoms. This is consistent with the cultural influences which tell Pakistani women to accept these symptoms as part of being a woman rather than complain about it, there are greater pains to bear as a woman. Amongst those who did use medication the majority were satisfied with their treatment.

The COCP usage in the 3 major cities of Pakistan is very low in this study (Table-1). There was a higher percentage of women using the COCP (21.5%) in Lahore as compared to 5% in Islamabad and 2.6% in Karachi. As there were very few contraceptive pill users (10.2%) in this study. This conforms to the low average contraceptive pill usage in Pakistan (2%),[15] being lower in rural areas which have not been sampled in this study.

One of the major drawbacks of this study was

reliance on retrospective self report, which introduces bias. While some studies have shown that retrospective reporting can also be accurate for the diagnosis of PMS and PMDD,[16,17] the retrospective approach has shown discrepancies in retrospective and prospective ratings in the same women.[18] Prospective charting on the other hand has a 50% refusal rate.[19,20]

When planning future studies, investigators should keep in mind that when comparing ICD 10, ACOG and DSM-IV classifications, it appears that with ICD 10, too many women are labeled with PMS; while DSM-IV is too restrictive, resulting in under-diagnosis. ACOG constitutes some kind of a compromise between the former two.

Conclusions

Prevalence of PMS according to ICD-10 was 79.9%. Physical symptoms were the most prevalent PMS experienced by Pakistani women in this study, and significantly affect activities of their daily life. This is also the experience of women from other Asian countries as well as European and Latin-American women. Further research, which incorporates prospective rating charts using existing standard classificatory systems, should be undertaken to establish the actual population based incidence of PMS in Pakistani women and its impact on quality of life.

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References

1. World Health Organization (WHO). International Classification of Diseases. 10th revision. Geneva: WHO; 1996.
2. American College of Obstetricians & Gynaecologists (ACOG). Premenstrual syndrome. Washington (DC): National Guideline Clearinghouse; 2000.
3. American Psychiatric Association (APA). Diagnostic & statistical Manual of mental disorders.4th edition. Washington (DC): APA; 1994; pp 714-8.
4. Nisar N, Zehra N, Haider G, Munir AA, Sohoo NA. Frequency, intensity and impact of premenstrual syndrome in medical students. J Coll Physicians Surg Pak 2008; 18: 481-4.
5. Shershah S, Morrison JJ, Jafarey S. Prevalence of premenstrual syndrome in Pakistani women. J Pakistan Med Assoc 1991; 41: 101-3.
6. Tabassum S, Afridi B, Aman Z, Tabassum W, Durrani R. Premenstrual Syndrome: Frequency and severity in young college girls. J Pak Med Assoc 2005; 55: 546-9.
7. Johnson TM. Premenstrual syndrome as a western culture-specific disorder. Cult Med Psychiarty 1987; 11: 337-56
8. Chrisler JC, Caplan P. The strange case of Dr.Jekyll and Ms. Hyde: how PMS became a cultural phenomenon and a psychiatric disorder. Annu Rev Sex Res 2002; 13: 274-306.
9. Lee AM, So-Kum Tang C, Chong C. A culturally sensitive study of premenstrual and menstrual symptoms among Chinese women. J Psychosom Obstet Gynaecol 2009; 30: 105-14.
10. ESOMAR CODE & CONDUCT. Available from URL: www.Esomar.org/uploads/pdf/ESOMAR_Codes&Guidelines_ICCCode.pdf. Cited 7 January 2008.
11. "A Procedure for Objective Respondent Selection within the Household" Kish L. J Am Statistical Assoc 1949; 44: 380-7.
12. Johnson SR, McChesney C, Bean JA. Epidemiology of premenstrual symptoms in non-clinical sample I. Prevalence natural history & Health seeking behavior. J Reprod Med 1988; 33: 340-6.
13. Dennerstein L, Lehert P, Bäckström TC, Heinemann K. The effect of premenstrual symptoms on activities of daily life. Fertility and Sterility. Accepted May 2009a; In Press.
14. Dennerstein L, Lehert P, Bäckström TC, Heinemann K. Premenstrual symptoms - severity, duration and typology: an international cross-sectional study. Menopause Int 2009; 15: 120-6.
15. Pakistan Demographic and Health Survey (PDHS) 2006-2007.
16. Steiner M, Steiner DL. Validation of a revised visual analog scale for premenstrual mood symptoms: results from prospective and retrospective trials. Can J Psychiatr 2005; 50: 327-32.
17. Bertone-Johnson ER, Hankinson SE, Hankinson SE, Johnson SR, Manson JE, A simple method of assessing premenstrual syndrome in large prospective studies. J Reprod Med 2007; 52: 779-86.
18. Marvan ML, Cortes-Iniestra S. Women's beliefs about the prevalence of premenstrual syndrome and biases in recall of premenstrual changes. Health Psycho 2001; 20: 276-80.
19. Sternfeld B, Swindle R, Chawla A, Long S, Kennedy S. Severity of premenstrual symptoms in a health maintenance organization population. Obstet Gynecol 2002; 99: 1014-24.
20. Sveindottir H. Backstrom T. Prevalence of menstrual cycle symptom cyclicity and premenstrual disorder in a random sample of women using and not using oral contraceptives. Acta Obstet Gynecol Scand 2000; 79: 405-13.