The Relationship of Perceived Severity of Premenstrual Syndrome with Knowledge, Attitude and Recorded Severity of Syndrom by a Daily Calendar among University Students in Iran

Roghayeh Dadi Givshad (MSc)[1]*, Shahla Nourani Saadoldin (MSc)[2], Habibollah Esmaily (MD)[3,4]

[1] MSc in Midwifery, Department of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran
[2] Lecturer, Department of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran
[3] Associate Professor, Health Sciences Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
[4] Department of Biostatistics and Epidemiology, School of Health, Mashhad University of Medical Sciences, Mashhad, Iran

A R T I C L E I N F O	A B S T R A C T

Background & aim: Premenstrual syndrome (PMS) refers to a set of psychological and physical symptoms, which interfere with one's daily life. The aim of this study was to determine whether the perceived severity of PMS symptoms is correlated with knowledge, attitude, and severity of this condition according to the daily registration calendar among students of Ferdowsi University of Mashhad, Iran.

Methods: This descriptive, analytical study was performed on 55 first-year bachelor students, who were residents of Ferdowsi University dormitories from February 2013 to June 2013. Data collection tools included the selection form, general health questionnaire, PMS diagnosis form (derived from DSM-IV), questionnaire of menstrual information, demographic characteristics, and perceived severity of PMS symptoms, questionnaires on knowledge and attitude towards PMS, and the daily registration calendar. For data analysis, descriptive and analytical tests were performed, using SPSS version 16.0.

Results: The results showed that knowledge about PMS was significantly correlated with the perceived severity of PMS (P=0.009, r_{Sp}=-0.35). However, there was no significant correlation between students' attitude towards PMS and perceived severity of this condition (P=0.54, r_{Sp}=0.08). Also, no significant difference was found between the perceived severity of PMS symptoms and the severity of symptoms, according to the daily registration calendar (P=0.86, r_{Sp}=0.02).

Conclusion: Based on the findings, the perceived severity of PMS symptoms was not significantly correlated with students' attitude towards PMS or PMS severity, based on the daily registration calendar. However, there was a significant correlation between knowledge about PMS and perceived severity of this condition; therefore, planning is essential for improving students' knowledge on this issue.

Introduction

Premenstrual syndrome (PMS) refers to a series of psychological and physical symptoms, which occur during the menstrual cycle and affect women's normal performance (1). These symptoms start five days before the onset of menstrual period and subside within four days after the beginning of menstruation (2).

Physical and behavioral symptoms of PMS vary from one person to another (3). These symptoms can clearly disturb one's career, education, social activities, and social relations (4). PMS affects up to 75% of women in the reproductive age and is reported in women coming from different cultural backgrounds (5, 6). However, the frequency and severity of PMS symptoms vary among different cultural groups (7).

* *Corresponding author:* Roghayeh Dadi Givshad, MSc in Midwifery, Department of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran. Email: R.dadi@bums.ac.ir

Overall, most women experience mild symptoms of PMS (8). The exact etiology of this multi-factorial condition remains unknown, and no exact criteria have been established for the diagnosis of PMS (3, 5). In fact, premenstrual experience is highly variable and personal, and women do not undergo the same changes; even an individual's experience may vary from one month to another (4, 9).

The most useful diagnostic tool for PMS is a chronological report in which the nature of symptoms and their impact on the individual's performance are prospectively recorded; the patient should record at least two consecutive menstrual cycles (4). Reports on the frequency and severity of PMS have been inconsistent in different studies, which might be due to variations in assessment tools, diagnostic criteria, and study populations (3, 10, 11).

In a study by Farahani et al. in Arak, Iran (2013), the prevalence of mild, moderate, severe, and very severe PMS was 52.2%, 38.8%, 5.2%, and 0.6%, respectively (12). Moreover, according to a study by Jafarnejad et al. (2013), the prevalence of mild, moderate, severe, and very severe PMS was 36.9%, 36.9%, 15.4%, and 10.8%, respectively among students of Mashhad University of Medical Sciences, Mashhad, Iran (13).

Based on a study by Sadler and colleagues (2010), the prevalence of PMS was estimated at 24% (14). Cheng et al. in Taiwan (2011) reported a prevalence rate of 39.8% among undergraduate and graduate students (15). Additionally, in a study in Switzerland (2010) on women, aged 15-54 years, 10.3% had PMS, while 3.1% suffered from premenstrual dysphoric disorder (16).

In a study by Magdy Hassan et al. (2010) in Saudi Arabia, PMS was mild, moderate, and severe in 45%, 32.6%, and 22.4% of medical students, respectively (17). Additionally, Moghadam et al. (2013) in their review study on the worldwide prevalence of PMS reported an overall rate of 48%. The frequency of this condition was estimated at 40% in Europe, 85% in Africa, 46% in Asia, and 60% in South America; moreover, the highest prevalence of PMS was reported in Iran (18).

A variety of treatments have been proposed for PMS. In several studies, use of zinc (19),

pyridoxine, magnesium, and calcium has been shown to be effective for the alleviation of some PMS symptoms (20). It should be mentioned that education on the nature of this condition is the first-line treatment (8).

The results of a study by Armand et al. (2010) in Kashmar, Iran showed that training on stress management via cognitive-behavioral methods is effective in overcoming psychological problems and symptoms of PMS (21). The patient should be assured that adequate knowledge about PMS is no less valuable than treatment. In fact, information on PMS can be useful when unpleasant emotions are elicited during the menstrual cycle, causing problems in one's social interactions (4).

Based on the results of a study by Taghizadeh et al. (2009), counseling can decrease the overall severity of PMS, patient's physical symptoms, anxiety, interpersonal sensitivity, and PMS-related aggression (22). Also, Davoudi et al. revealed that group cognitive-behavioral/ narrative therapy can be effective in diminishing the problems of students with PMS (23).

From a socio-cultural point of view, some researchers suggest that PMS is a demonstration of one's negative attitudes and beliefs about the unpleasant experience of menstrual bleeding (24). A study in Thailand on nurses showed that the prevalence of PMS was higher in those with negative attitudes towards menstruation (25). On the contrary, in a study by Ping Wang et al. (2011) on rural girls, aged 13-19 years, no significant correlation was found between the severity of PMS symptoms and the attitude towards menstruation (26).

Considering the scarcity of studies on knowledge and attitude towards PMS and the relationship between PMS severity and knowledge, we aimed to determine whether the perceived severity of PMS symptoms is associated with knowledge, attitude, and severity of this condition, according to the daily registration calendar among students of Ferdowsi University of Mashhad, Iran.

Materials and Methods

This descriptive, analytical study was performed on 55 first-year students, who were dormitory residents at Ferdowsi University of Mashhad. After obtaining an introductory letter

from the School of Nursing and Midwifery, the researcher visited the Office for Student Dormitories at Ferdowsi University. After receiving permission, the researcher visited campus No. 2 and 4. Since the first-year students were residents of these campuses, only students in the corresponding dormitories were considered as the study population. The researcher introduced the objectives and methods of the study and started sampling by making arrangements with the authorities.

In the present study, the inclusion criteria were as follows: 1) being diagnosed with PMS, based on the standard questionnaire of provisional diagnosis, derived from the Diagnostic & Statistical Manual of Mental Disorders-fourth edition (DSM-IV); 2) being single; 3) Iranian nationality; 4) living in the dormitory; 5) regular menstrual periods (a time interval of 28-33 days between two menstrual bleedings and 7-10 days of bleeding in each cycle of menstruation); 6) no prior history of chronic diseases (e.g., asthma, diabetes, hypertension, epilepsy, migraine, thyroid disorders, anemia, cardiac diseases, respiratory and renal diseases, and psychiatric disorders); 7) no experience of tragic events such as death of first-degree relatives, intense family conflicts, or severe financial problems in the family over three months before or during the study; 8) lack of regular exercise (i.e., membership in the provincial or national sports teams and participation in regular exercise programs at least three times a week or more for at least 30 min) three months before the start of the study; and 9) scores below 28 on the General Health Questionnaire (GHQ). Informed consent forms were obtained from the subjects.

The exclusion criteria were as follows: 1) adherence to a special diet (i.e., vegetarianism, raw eating, and hydrotherapy); 2) major adverse events, e.g., death of a first-degree relative, intense family conflicts, or severe financial problems in the family within three months before or during the study; 3) being married; 4) use of pharmaceutical or non-pharmaceutical methods for PMS relief; 5) irregular menstrual periods; 6) failure to correctly complete the daily registration calendar of PMS symptoms; 7) regular physical activity (i.e., membership in the provincial or

national sports teams and participation in regular exercise programs at least three times a week or more for at least 30 min) during the study or three months before the start of the study; and 8) leaving the dormitory.

In total, 68 dormitory residents met the inclusion criteria. The participants completed the questionnaires on demographic characteristics, menstruation, perceived severity of PMS, knowledge about PMS, and attitude towards this condition and handed them to the researcher.

The researcher calculated the subjects' body mass index by measuring their height and weight. Afterwards, the Farsi checklist for daily registration of PMS symptoms over a menstrual cycle was handed to the students; the subjects were given the necessary explanations on how to complete the questionnaire. The participants could contact the researcher via phone calls and text messages as they completed the questionnaires. After collecting the initial forms, the subjects received the daily registration form for the next menstrual cycle.

The data collection tools applied in this study are described below.

The General Health Questionnaire (GHQ) was first conceptualized by Goldberg (1972), consisting of 28 questions and four subscales (seven questions each). GHQ scoring is as follows: 1) A (score 0), B (score 1), C (score 2), and D (score 3). The score on each subscale is between 0 and 21, with the total score ranging from 0 to 84. In this questionnaire, lower scores indicate better mental health (27). The cut-off point is considered to be 28, with scores higher than 28 indicating one's susceptibility to mental disorders.

Another used tool in this study was the standard 11-item questionnaire of provisional diagnosis, derived from DSM-IV. Based on the scores, if an individual has 5 (or more) out of 11 PMS symptoms, she is considered to have PMS; at least one of the symptoms should be among the first four major symptoms (28).

The questionnaire on demographic characteristics, menstruation, and perceived severity of PMS consisted of 13 questions. In total, 12 questions were attributed to demographic information, menstruation, and perceived severity of dysmenorrhea, while one question was related

to the perceived severity of PMS before menstruation, which was retrospectively measured only once at the beginning of the study. The subjects were asked to choose one of the options (i.e., mild, moderate, and severe) to describe the perceived severity of PMS before menstruation.

Moreover, a researcher-made questionnaire (10 questions) was used to assess subjects' knowledge about the definition of PMS, its incidence, causes, and treatment. In this questionnaire, correct and incorrect answers were given scores 1 and 0, respectively (maximum score: 10, minimum score: 0). Poor, moderate, and high levels of knowledge about PMS were defined as 0-50%, 50-75%, and 75-100% of the total score, respectively.

Also, the researcher-made questionnaire for assessing the subjects' attitude towards PMS consisted of 10 questions about PMS terms, diet, and treatment. The grading in this questionnaire was as follows: agree (score 1), no idea (score 2), and disagree (score 3); the highest and lowest scores were 30 and 10, respectively. Poor, moderate, and good attitudes towards PMS were defined as 0-50%, 50-75%, and 75-100% of the total score, respectively.

The standard daily registration calendar of PMS symptoms consisted of 10 most common physical symptoms and 12 most common psychological symptoms of PMS. The physical symptoms included acne, bloating, breast tenderness, dizziness, headache, flushing, nausea, diarrhea, constipation, palpitation, edema, and increased appetite. The psychological symptoms included fatigue, anger, anxiety, confusion, poor concentration, random crying spells, depression, desire for certain foods, forgetfulness, irritability, mood swings, sensitivity, and tendency to be alone (28).

In this calendar, the status of PMS was documented since the first day of the menstrual cycle (the first day of bleeding). The subjects determined the severity of symptoms, using a 0-3 scale. Afterwards, the severity of PMS was specified, using the following formula:

Percentage of intra-cycle changes= (total score of luteal phase-total score of follicular phase)/ (total score of luteal phase) × 100 (29, 30)

The samples completed the daily registration calendar of PMS symptoms in two consecutive cycles. First, the mean severity of each symptom in the calendar was measured in two cycles, using the mentioned formula. Then, the overall severity of PMS was determined, based on the mean severity of all the symptoms. In total, PMS was mild, moderate, severe, and very severe if the calculated score was less than 30%, ≥30% and <50%, 50-60%, and >60%, respectively (6, 31).

In order to determine the validity of the questionnaires, content validity was applied. For this purpose, the information gathered through literature review was used to prepare the questionnaires under expert supervision. The questionnaires were handed to 10 faculty members of Mashhad University of Medical Sciences. The questionnaires were confirmed after making revisions, based on expert comments.

Cronbach's alpha was calculated to determine the reliability of GHQ. The questionnaire was distributed among 100 subjects, and then, Cronbach's alpha coefficient was calculated. In a study by Goldberg & Williams (1998), the reliability of total GHQ was reported to be 0.95, based on the bisection method (32). In the present study, the reliability of the questionnaire was confirmed via Cronbach's alpha (0.80).

The reliability of the questionnaire of provisional PMS diagnosis (derived from DSM-IV) was confirmed by r_p=0.82. Also, the reliability of the questionnaire on knowledge about PMS was confirmed by r_p=0.92. In addition, the reliability of PMS attitude questionnaire was confirmed by r_{sp}=0.93. Finally, the reliability of the daily registration form of PMS symptoms was confirmed by r_p=0.82.

By considering the exclusion criteria, 55 questionnaires were analyzed in this study. For data analysis, descriptive statistics and Pearson's and Spearman's correlation coefficients were calculated, using SPSS version 16.0.

Results

The mean age of the participants was 18.9±1.11 years, and the mean body mass index was 21.46±4.02 kg/m². The majority of subjects (n=15, 27.3%) were students of theology (Table 1). In the majority of subjects (n=34, 61.8%),

father's educational level was secondary school or higher. Also, 16 women (29.1%) had primary school education.

Table 1. Distribution of subjects based on the field of education

Field of education	N (%)
Theology	15 (27.3)
Literature	11 (20.0)
Engineering (e.g., industrial sciences, natural resources, chemistry, computer sciences, material engineering, and metallurgy)	10 (18.2)
Environment	5 (9.1)
Agriculture	5 (9.1)
Economy and administrative sciences	4 (7.3)
Mathematics	3 (5.5)
Veterinary medicine	2 (3.6)
Total	55 (100)

Table 2. Distribution of subjects in terms of knowledge and attitude towards PMS

Variables	N (%)
Knowledge	
Poor	19 (34.5)
Moderate	34 (61.8)
Good	2 (3.6)
Attitude	
Poor	5 (9.1)
Moderate	35 (63.6)
Good	15 (27.3)

The majority of subjects (n=34, 61.8%) had moderate knowledge about PMS. Also, 35 women (63.6%) showed a moderate attitude towards PMS (Table 2). Based on the ANOVA test results, field of education was not significantly associated with the mean score of students' knowledge (P=0.67, F=0.71) or attitude towards PMS (P=0.81, F=0.54).

ANOVA test results showed that perceived severity of PMS and students' mean score of knowledge about PMS were significantly associated (P=0.03, F=3.76), whereas the mean score of attitude was not significantly correlated with the perceived severity of PMS (P=0.60, F=0.51).

Spearman's correlation test showed that knowledge about PMS had a statistically significant correlation with the perceived severity of PMS (P=0.009, r_{Sp}=-0.35). Also, the perceived severity of PMS decreased as knowledge about PMS increased. However, no significant correlation was found between students' attitude towards PMS and the perceived severity of PMS (P=0.54, r_{Sp}=0.08).

The present findings showed no significant correlation between the perceived severity of PMS and its severity based on the daily registration calendar of PMS symptoms (P=0.86, r_{Sp}=0.02).

Table 3. Comparison between the perceived severity of PMS and severity of this condition, based on the daily registration calendar

	N (%)	Spearman's test results
Perceived severity of PMS		
Mild	13 (23.6)	
Moderate	38 (69.1)	(P=0.86 , r=0.02)
Severe	4 (7.3)	
Severity of PMS based on the daily registration calendar		
Mild	34 (61.8)	
Moderate	15 (27.3)	
Severe	6 (10.9)	

Discussion

The results showed that knowledge about PMS had a statistically significant correlation with the perceived severity of PMS, whereas no significant correlation was found between PMS severity and students' attitude towards PMS.

Also, no significant relationship was found between the perceived severity of PMS and PMS severity, based on the daily registration calendar.

In this study, the severity of PMS based on the daily registration calendar was reported as mild in 61.8% of cases, moderate in 27.3% of cases, and severe in 10.9% of subjects. Also, with regard to the perceived severity of PMS, 23.6%, 69.1%, and 7.3% of students reported mild, moderate, and severe PMS, respectively.

In a study by Magdy Hassan et al. (2010) on the students of Saudi Arabia University of Medical Sciences, mild PMS was reported in the majority of students, according to the American College of Obstetricians and Gynecologists (ACOG) criteria (17). These results were consistent with our findings in terms of PMS severity, based on the daily registration calendar, which is probably due to the use of two standard forms in these studies for PMS evaluation.

In a study by Farahani et al. on dormitory students of Arak University of Medical Sciences (2013), mild, moderate, severe, and very severe PMS was reported in 52.2%, 38.8%, 5.2%, and 0.6% of students, respectively, based on the short documentation form of PMS (10 items). Moreover, in a study by Jafarnejad et al. (2013) on the students of Mashhad University of Medical Sciences, PMS was mild, moderate, severe, and very severe in 36.9%, 36.9%, 15.4%, and 10.8% of cases, based on the registration form, respectively (12, 13). These findings were inconsistent with the present results, which may be due to differences in factors such as the used data collection tools and study population in the study by Farahani and study population in the study by Jafarnejad and colleagues.

As previously mentioned, reports on the incidence and severity of PMS are inconsistent in different Iranian and international studies, which is due to differences in the study population, research tools, and attitudes towards menstruation in different societies. The results of this study showed that 34.5%, 61.8%, and 3.6% of students had poor, moderate, and good knowledge about PMS, respectively. Also, 9.1%, 63.6%, and 27.3% of subjects had poor, moderate, and good attitudes towards PMS, respectively.

In a study by Ping Wang (2011) in Malaysia, 34.9% of participants stated that they had heard about PMS, while 44.6% had gained further information about this condition. Moreover, 63.1% of participants stated that they had PMS, 61.1% believed that PMS is a normal part of the menstrual cycle, 12.3% considered PMS to be treatable, and 6.3% regarded PMS as a disease or disorder (26).

In the present study, there was a significant correlation between knowledge about PMS and perceived severity of this condition; in fact, the perceived severity of PMS decreased as the knowledge about this condition increased. Therefore, the results of this study indicated that adequate knowledge about PMS is not any less valuable than treatment; in fact, training on the nature of this condition is the first-line treatment (4, 8). Bhatia et al. (2002) in their study concluded that non-pharmacological interventions such as training, diet, lifestyle changes, and supportive treatment could be beneficial for individuals with mild to moderate symptoms of PMS (32).

In this study, no significant correlation was found between the perceived severity of PMS and students' attitudes toward this condition; this finding was consistent with the study by Ping Wang (26). Also, in a study by Marvan et al. in Thailand (2001), the prevalence of PMS was higher in those with a negative attitude towards menstruation (25, 26). As previously stated, attitude towards PMS is affected by several issues including the prevalent culture, attitudes towards menstruation, and negativity towards the unpleasant nature of menstruation.

In this study, no significant relationship was observed between the perceived severity of PMS and the severity of this condition, based on the daily registration calendar. In other words, most people (69.1%) reported moderate PMS, while according to the daily registration calendar, the majority (61.8%) had mild PMS. These findings showed that for determining the

severity of PMS, standard tools should be used in order to provide proper treatments for patients, based on the severity of PMS. However, we could not find any studies on the relationship between the perceived severity of PMS and the severity of this condition, based on the daily registration calendar.

The obtained results showed that knowledge about PMS was associated with the perceived severity of this condition. In other words, perceived severity of PMS decreased as knowledge about this condition increased; therefore, training with a focus on improving patients' knowledge is essential.

The present study had certain limitations such as subjects' personality disorders, which were uncontrollable due to the magnitude of the study and the performed evaluations. Also, another limitation of this study was the researcher's confidence in the validity of forms completed by the research units.

Considering the scarcity of studies on knowledge and attitude towards PMS, further research in this area is recommended. Given the descriptive design of this study, a clinical trial is recommended to determine the relationship between the perceived severity of PMS and knowledge and attitude towards PMS after training.

Conclusion

In this study, the perceived severity of PMS was associated with knowledge on this condition, whereas no significant association was found between the perceived severity of PMS and subjects' attitudes towards PMS or its severity based on the daily registration calendar. Considering the importance and prevalence of PMS among students, the need for counseling and training courses in this area is strongly felt in order to improve knowledge and decrease the negative effects of this condition on different aspects of life.

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Conflicts of Interest

The authors declare no conflicts of interest.

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