

## ORIGINAL ARTICLE

# Studying the factors associated with Premenstrual syndrome prevention among pre-university students in Tehran

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## Key words

Premenstrual Syndrome • Preventive behavior • Female Students

## Summary

**Introduction.** *Premenstrual syndrome is one of the common menstrual disorders in adolescents. Considering the destructive effects of this syndrome on adolescents' activity and performance and the importance of epidemiological studies in designing preventive interventions,*

**Aim.** *This study aimed to determine some of the factors associated with the prevention of premenstrual syndrome among adolescents.*

**Settings and Design.** *In a cross-sectional study, 255 female high school students in Tehran were selected using multistage random sampling method.*

**Methods and Material.** *The data were collected using a demographic and background questionnaire and a valid and reliable questionnaire to assess preventive behaviors of premenstrual syndrome.*

**Statistical analysis used.** *The collected data were analyzed using SPSS software version 16 and descriptive statistics and logistic regression.*

**Results.** *The mean (SD) score of adoption of preventive behaviors of premenstrual syndrome was 19.25 (0.63) out of 50, and it was low. Also, weekly physical activity, mother education level, and family income were the factors affecting the adoption of preventive behaviors of premenstrual syndrome ( $P < 0.05$ ).*

**Conclusion.** *Due to the low adoption of preventive behaviors among students with lower income families, students with less physical activity and students with mothers with lower levels of education, it is suggested that more attention be paid to the above students in designing educational programs to promote the prevention of premenstrual syndrome.*

## Introduction

Premenstrual syndrome is a set of the physical, psychological and emotional disorders affecting the quality of life of individuals, and it is important to control and cure it [1]. Many researchers consider premenstrual syndrome as one of the most common psychosomatic disorders that impairs the women's' life [2]. This syndrome causes communication disorders, disruption of normal activities, sedentary lifestyle, lack of motivation and reduced accuracy in doing things, and if the severity of the symptoms is high, it disrupts the person's lifestyle, comfort and health [3]. This syndrome is a mental, neurological and endocrine disorder that appears as a recurrent course of physical, psychological and behavioral symptoms after ovulation and during a few days of menstrual onset (first week of Luteal phase) [4, 5]. The etiology of PMS is multifactorial in which the effect of hormonal disorders, especially low levels of progesterone in luteal phase, autonomic dysfunction, hyperglycemia - induced secretion and environmental factors such as alcohol intake and stress seem to be important [5].

Moreover, more than 150 symptoms have been attributed to PMS. The Symptoms include breast tenderness, headache, back pain, fatigue, tension and anxiety, unexplained anger or irritability, depression, varying degrees of edema in hands and feet, changes in sexual desire, bloating, joint and muscle pain, lack of energy, change in appetite, thirst, periods of crying, difficulty in concentration, aggression and suicidal tendencies [5, 6]. It is not also possible to determine the prevalence of this syndrome due to the variety of the forms of its symptoms. However, the incidence of this syndrome in different communities is estimated between 5 and 95% [7]. The prevalence of this syndrome was estimated to be 48% worldwide in a meta-analysis study in 2013 [8]. Although it was well studied in adults, however, it was only recently recognized in adolescents [9]. The emotional and mood symptoms that are common in this syndrome, when accompanied by the stresses of adolescence, usually cause the person to quarrel with others, and due to the lack of knowledge about the cause of their behavior change, they are considered as negative behaviors which finally cause tension, physical and

behavioral conflicts [5]. Menstrual disorders, including PMS, are also common in young adults and women. These disorders are often sources of anxiety for these patients and their families [5]. In the study of Ahmadi et al, 37% [10] and in study of Bakhshani et al, 83.1% of female adolescents were affected by PMS [11].

However, preventive behaviors for premenstrual syndrome include behaviors such as eating calcium-rich foods such as milk and yogurt, taking multivitamin supplements, exercising, staying away from stressful situations, and so on [5]. Adolescence is one of the most important periods of life in which the lifestyle is formed and stabilized. Adolescents are the rich assets of the future and addressing adolescent health is one of the priority programs in health and prevention medicine in the world [12]. According to the studies conducted by the researchers of the present study, the adoption of preventive behaviors of premenstrual syndrome and the factors affecting them have not been studied so far in Iranian adolescents. According to experts, the first step in designing preventive interventions is epidemiological studies [13]. According to epidemiologists, the first step is to design preventive interventions for this disorder [13]. Also, because the woman's menstrual cycle begins in adolescence, and it is easier to internalize healthy behaviors at this age, and also because of the destructive effects of this syndrome on their performance in their life [5], this study aimed at determining the factors associated with the prevention of premenstrual syndrome among adolescents.

## Methods

This was a descriptive-analytical cross-sectional study conducted with 255 students studying pre-university course in Tehran in 2016. The sampling method was multi-stage random, so that a list of all 19 education districts of Tehran was first prepared. Then, out of these 19 districts, 4 districts were randomly selected and one high school was randomly selected from each district. In the last stage, one class was randomly selected from each selected high school and their students were included in the study. Inclusion criteria were: having good health (no history or known disease), regular menstrual periods for at least one year, not using hormonal compounds, and willingness to take part in the study (by completing the informed consent form to participate in the study). Exclusion criteria were: incomplete completion of the questionnaires, lack of menstruation and irregular menstruation, and the use of hormonal compounds during the study.

Due to the results of a pilot study among 30 students and considering  $P = 0.2$  for adoption of preventive behaviors of premenstrual syndrome, and also using Cochran's sample size formula and calculating  $d = 0.05$ , the sample size was estimated to be 245 Students, which according to statistical experts and taking into account the 5% probability of sample loss, 255 Students were included in the study.

The data collection tool in this study was a questionnaire that consisted of 2 parts:

1. Demographic and background information: included age, ethnicity, field of study, marital status, ethnicity, parental education level, parental employment status, monthly family income, physical activity per week, number of family members and the birth rank in the family;
2. Khalilipour Darestani and Panahi questionnaire was used to assess the behaviors associated with premenstrual syndrome prevention [5]. This questionnaire consisted of 10 items with a 5-level scale: always (5 points), often (4 points), sometimes (3 points), rarely (2 points) and never (1 point). The score range was between 10 and 50 [5]. This questionnaire has already been validated by the researchers; first, the questionnaire was sent to 10 professors to analyze its content and after getting their opinions, the necessary changes were made. Then it was resent to the professors to confirm the changes, and the final changes were made to the questionnaire. Finally, the questionnaire obtained an acceptable score in terms of CVR and CVI (CVR = 0.98, CVI = 0.89). Also, to make it reliable, it was given to 30 students in the same educational level and Cronbach's alpha coefficient was calculated to be 0.91 [5]. Also, according to the researchers, the rate of adoption of preventive behaviors was classified into two levels: poor (scoring less than 50% of the total score) and good (scoring 50-100%) [14, 15], and this classification was used for the logistic regression in the study.

After receiving ethical approval from Deputy Director of Research and Technology at the Islamic Azad University of Science and Research (IR.IAU.SRB.REC.1394.11), and informing the Department of Education in Tehran and school officials, questionnaires were completed by the students. Also, before starting the study, their written consent was obtained. The questionnaires were self administered and the students were assured that all requested information would be confidential. The collected data were analyzed using SPSS software version 16 and descriptive statistics and logistic regression. The variables entered simultaneously and the interaction method of independent variables classified as index (indicator) was used, and the first class of variables was selected as the reference class. Moreover, the preventive behaviors of premenstrual syndrome was dependent variable, whereas age, ethnicity, field of study, marital status, ethnicity, parental education level, parental employment status, monthly family income, physical activity per week, number of family members and the birth rank in the family were independent ones. The significant level was also considered less than 0.05.

## Results

240 students were studied and 15 were excluded from the study due to incomplete completion of the questionnaires (participation rate: 94.2%). 50.8% (122 people) were in the age group of 18 years. Only 12.5% (30 people)

**Tab. I.** Demographic and background characteristics of the participating students.

Variables		Frequency	Percent
Age	17	64	26.7
	18	122	50.8
	19	54	22.5
Field of study	Conservatory	84	35
	Experimental	56	23.3
	Math	30	12.5
	Human	70	29.2
Marital status	Single	222	92.5
	Married.	18	7.5
Ethnicity	Turk	110	45.8
	Turkmen	78	32.5
	Others	52	21.7
Mother's education status	Below-diploma	78	32.5
	Diploma and post-diploma	78	32.5
	Bachelor's and higher education levels	84	35
Father's Education Status	Below-diploma	76	31.7
	Diploma and post-diploma	62	25.8
	Bachelor's and higher education levels	102	42.5
Mother's Job Status	Housekeeper	144	60
	Employee	40	16.7
	Others	56	23.3
Father's Job Status	Freelance	116	48.3
	Employee	36	15
	Military	24	10
	Others	64	26.7
Monthly family income	less than 1 million	74	30.8
	2-3 Million	106	44.2
	more than 3 million	60	25
Weekly physical activity	every day	32	13.4
	Sometimes	92	38.3
	Rarely	116	48.3
Number of family members	3	56	23.3
	4	112	46.7
	5 or more	72	30
Birth rank in family	First	98	40.8
	Second	80	33.4
	Third or higher	62	25.8

were studying mathematics, 97.5% (234 people) were single, and 12.5% (30 people) reported doing physical activity every day. Table I shows other demographic and background characteristics of the Participating students. Also, the mean (SD) score of adoption of preventive behaviors of premenstrual syndrome in participating students was 19.25 (0.63) out of 50. In other words, the participants received 38.5% of the score of adoption of preventive behaviors of premenstrual syndrome. Table II shows the results of logistic regression to determine the factors affecting the adoption of preventive behaviors in premenstrual syndrome among Participating students. The results showed that the variables used predicted a total of 72.8% of the adoption of preventive behaviors of premenstrual syndrome ( $R^2 = 0.728$ ). Also the results showed that one of the effective factors in adopting such behaviors was the mothers' level of education ( $P = 0.021$ ), so that the chance of adopting

these behaviors in students with mothers with diploma, post-diploma, bachelor's and higher education levels was 1.219 and 3.543 times higher than students with mothers with below-diploma degree, respectively. Another factor effective the adoption of premenstrual syndrome preventive behaviors was the amount of family income ( $P = 0.041$ ), so that the chances of adopting such behaviors in students with their family income between 2 and 3 million and more than 3 million, were 1.129 and 2.869 times more than the students whose family income was less than 2 million in a month respectively. Another factor effective the adoption of premenstrual syndrome preventing behaviors was physical activity ( $P = 0.008$ ), so that the chances of adopting these behaviors in students with occasional and rare physical activity were 0.758 and 0.451 times of those with a regular daily physical activity. Also, there was no significant relationship between age,

Tab. II. The factors affecting the preventive behaviors of premenstrual syndrome among participating students in logistic regression.

Variable	Sig.	OR (95% CI)
<b>Age</b>	0.541	
18	0.425	1.22222 (0.857-1.432)
19	0.411	1.301 (0.841-1.475)
<b>Field of study</b>	0.842	
Experimental	0.358	1.212 (0.974-1.359)
Math	0.412	0.555 (0.456-1.136)
Human	0.651	0.616 (0.543-1.712)
<b>Marital status</b>	0.153	
Married	0.198	1.105 (0.711-1.981)
<b>Ethnicity</b>	0.214	
Turkmen	0.325	4.189 (0.389-7.220)
Others	0.648	1.526 (0.734-2.055)
<b>Mother's education</b>	0.021	
Diploma and post-diploma	0.013	1.219 (1.107-1.654)
Bachelor's and higher education levels	0.009	3.543 (2.916-6.005)
<b>Father's education</b>	0.594	
Diploma and post-diploma	0.421	0.334 (0.212-1.340)
Bachelor's and higher education levels	0.212	1.255 (0.830-2.971)
<b>Mother's Job Status</b>	0.717	
Employee	0.592	0.554 (0.409-1.407)
Others	0.645	1.333 (0.954, 2.210)
<b>Father's Job Status</b>	0.453	
Employee	0.311	0.655 (0.550-1.077)
Military	0.212	2.409 (0.713-6.017)
Others	0.551	1.213 (0.879-1.999)
<b>Monthly family income</b>	0.041	
2-3 million	0.033	1.129 (1.033-1.906)
More than 3 million	0.024	2.869 (1.769-4.662)
<b>Weekly physical activity rate</b>	0.008	
Sometimes	0.025	0.758 (0.683-0.950)
Rarely	0.036	0.451 (0.401-0.627)
<b>Number of family members</b>	0.681	
4	0.753	0.469 (0.417-1.611)
5 or more	0.844	0.619 (0.313-1.213)
<b>Birth rank in family</b>	0.551	
Second	0.489	1.333 (0.821-1.419)
Third or higher	0.525	1.458 (0.712-1.286)
Constant	1.000	7.541371

field of study, marital status, ethnicity, father's level of education, parental employment status, number of family members and birth rank in the family with premenstrual syndrome preventive behaviors ( $P > 0.05$ ).

## Discussion

This study aimed to determine some of the factors affecting the prevention of premenstrual syndrome among pre-university students in Tehran. The adoption of premenstrual syndrome preventing behaviors in these students was at a low level. This might be due to their insufficient knowledge and attitude about premenstrual syndrome, because there was a significant and direct relationship between these two variables and behavior [16, 17]. These results were in consistent

with the results of the studies of Panahi et al. [14], Gharlipour et al. [18] and Panahi et al. [19], but they were inconsistent with the results of the studies of Panahi et al. [15], Peyman et al. [20] and Farshbaf Khalili and Colleagues [21] which reported moderate preventive behaviors adoption. Possible reasons for this discrepancy could be differences in the age of the participants as well as differences in the type of preventive behaviors.

The results also showed that one of the effective factors in adopting preventive behaviors in premenstrual syndrome was physical activity. One of the possible reasons for this result might be the homogeneity of these two variables. In fact, physical activity is a kind of preventive behavior by itself. Similar to the present result, the results of a study by Ghaffari et al. showed that a regular exercise program reduced the severity of premenstrual syndrome [22]. Also, the results of the

study by Safavi Naeini showed that physical activity was effective in reducing the symptoms of premenstrual syndrome [23]. The results of this part of the present study were consistent with the results of Panahi et al. [15] and Masho et al. [24], but they were inconsistent with the results of Panahi et al. [19]. One of the possible reasons for this discrepancy might be the differences in factors such as the Prevention topic, gender and age of participants in both studies.

Moreover, the results showed that another factor influencing the adoption of preventive behaviors of premenstrual syndrome was the mother's level of education. Education is one of the most important socio-economic indicators that affects the knowledge, attitude and skills necessary to adopt health-related behaviors [25], and as the mothers' awareness, positive attitude and behaviors associated with preventing premenstrual syndrome increased, positive changes also occurred in the students' preventive behaviors because they had close relationship with their mothers. It also seemed that people with higher education had more resources to acquire knowledge and information, and accordingly, the level of education of mothers, which are a model for adopting health behaviors for their children, could improve their children's adoption of preventive behaviors of premenstrual syndrome. These results are consistent with the results of studies by Panahi et al. [26], Etehadnezhad et al. [27], Kumar et al. [28], Menshadi et al. [29], Rabiei et al. [30] and Khani Jeihooni et al. [31].

The results also showed that another factor influencing the adoption of preventive behaviors of premenstrual syndrome was family income. Prevention of premenstrual syndrome requires a combination of lifestyle modification, dietary and nutritional changes, physical activity, and drug therapy [7, 32, 33]. It is obvious that doing most of these requires sufficient income in the family. The results, here, were not consistent with the results of studies of Haji Karim Baba et al. [34], and Panahi et al. [19]. One of the possible reasons might be the differences between the factors such as prevention topic and age of participants in these studies and the present one. Also in the study of Panahi et al. [19], the participants were students of both sexes, while in the present study, only girls were present.

The limitations of this study included the limited sample size, lack of data analysis about the students excluded from the study, and also the self-report method in completing the questionnaires which made the comparison of the results with other studies difficult. Since the participants were only female undergraduate students in Tehran, the results cannot be generalized to students in other parts of the country as well as those peers who left school studies before. Therefore, it is recommended to do this study in different populations and groups of women (in terms of age, education and region of residence). Lack of accurate information about the studied topic was other limitation of the study.

## Conclusion

The results of the present study showed that the adoption of preventive behaviors of premenstrual syndrome was poor among the Participating students. Due to the low adoption of preventive behaviors among the students with less physical activity, the students with mothers with lower levels of education, and the students with families with lower incomes, it is suggested that more attention be paid to the above students in designing educational programs to promote the prevention of premenstrual syndrome.

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## Conflict of interest statement

No conflict of interest has been expressed by the authors.

## Authors' contributions

MA, MA: implementation and collection of data, content collection, and writing the paper. RA, MKD, LD: collection of data and contributing to writing the paper. RP: content collection, writing the paper, supervisor, corresponding author.

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