LIFE: International Journal of Health and Life-Sciences
ISSN 2454-5872

Özmermer & Koruk, 2019

Volume 4 Issue 3, pp. 138-155

Date of Publication: 28th February, 2019

DOI-https://dx.doi.org/10.20319/lijhls.2019.43.138155

This paper can be cited as: Özmermer, T. & Koruk, F. (2019). Premenstrual Syndrome Frequency, Premenstrual Syndrome Coping Strategies and Factors Affecting Premenstrual Syndrome in University Students in Turkey. LIFE: International Journal of Health and Life-Sciences, 4(3), 138-155.

PREMENSTRUAL SYNDROME FREQUENCY, PREMENSTRUAL SYNDROME COPING STRATEGIES AND FACTORS AFFECTING PREMENSTRUAL SYNDROME IN UNIVERSITY STUDENTS IN TURKEY

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Abstract

Premenstrual syndrome (PMS) symptoms influence women's lives to a large extent. This study was conducted to understand the frequency of PMS, coping strategies and factors affecting PMS in university students in Sanliurfa, Turkey. In this cross-sectional study in which 376 university students were reached. 52.1% of the students were found to experience PMS. Engaging in various activities to expend energy eating sweets and using analgesics were found to be the most common methods used by the students to cope with PMS symptoms; however, they were not able to cope efficiently with water retention, balance/control issues and autonomic reactions. The logistic regression analysis showed that a unit of increase in age led PMS risk to increase by a factor of 1.179, whereas a unit of increase in weight led to an increase in PMS risk by a factor of 1.025.Also, low income increased PMS risk by a factor of 1.884, fast food consumption

increased it by a factor of 2.069, high salt consumption by a factor of 1.884, and anemia presence by a factor of 1.739. In conclusion, the prevalence of PMS was found to be high in the students and they were observed to have difficulty in coping with certain symptoms. On the basis of the results of the study, it is recommended that university students be given information about factors affecting PMS, how to cope with symptoms, what treatments are available, and that they been couraged to receive treatment for PMS.

Keywords

Premenstrual Syndrome, Menstruation, Coping Methods, University Students

1. Introduction

Frequently seen in women, Premenstrual Syndrome (PMS) is a collection of somatic, cognitive, emotional and affective symptoms which occur during the luteal phase of menstrual cycle, improve rapidly with the onset of menstruation, and are frequently observed throughout the reproductive period (Bölükbaş & Tiryaki, 2003; Nisar, Zehra, Haider, Munir & Sohoo, 2008).

Although PMS was defined long ago, its cause has not yet been illuminated. The occurrence of the syndrome is triggered by hormonal changes. There are various theories about what causes PMS. These include estrogen-progesterone imbalance, fluid retention, excessive secretion of prostaglandins, prolactin and renin-angiotensin-aldosterone imbalance, and psychosocial factors (O'Brien & Ismail, 2007; Taşkın, 2009; Türkçapar, A. F. & Türkçapar, M. H.,2011; Rosenfeld, et. al., 2008). Studies report that PMS is related to numerous factors. Some of these factors include age, stress, educational level, presence of PMS in the mother, leaving home for university, lack of physical activity, fast food consumption, experiencing menstrual irregularities, smoking, lack of knowledge or negative attitudes about menstruation, dysmenorrhea and caffeine consumption (Kırcan, Ergin, Adana & Arslantaş, 2012; Kısa, Zeyneloğlu & Güler, 2012; Nisar, et. al., 2008; Erbil, Karaca & Kırış, 2010; Demir, Algül & Güven, 2006; Gümüş, Bayram, Can & Kader, 2012; Tolassa & Bekele, 2014; Kebapçılar, Taner, Başoğul & Okan, 2012; Seedhom, Mohammed & Mahfouz, 2013; Robinson & Swindle, 2000).

The most common symptoms in women experiencing PMS are uneasiness, discomfort, inability to control anger, fatigue, dizziness, increased appetite, anxiety, lack of concentration, breast tenderness and swelling, and muscle and joint pain (Kısa, Zeyneloğlu & Güler, 2012; Erbil, Karaca & Kırış, 2010; Naeimi, 2015; Kebapçılar, et. al., 2012; Seedhom, Mohammed &

Mahfouz, 2013; Pınar & Öncel, 2011; Song, Chae, Jang, Park, Lee, K. E., Lee, S. H. & Jung, 2013; Daşıkan, Taş & Sözen, 2014). Although PMS symptoms influence women's lives to a large extent, most women with these symptoms are not eager to seek help for treatment due to behavioral obstacles (Robinson & Swindle, 2000). Studies show that the rate of seeing a physician with PMS-related complaints varies from 14.4% to 28.8% among women, which is quite low (Demir, Algül & Güven, 2006; Sule & Ukwenya, 2007). While resorting to temporary solutions (e.g. calling in sick, skipping school, overeating etc.) may provide short-term relief, such solutions lead to the recurrence of PMS symptoms in the long run (Türkçapar, A. F. &Türkçapar, M. H., 2011).

The severity of PMS symptoms is known to increase with age, peaks between the ages of 25-35 and starts to decline as menopause is approached (Yonkers &Davis, 2000). Although it has been suggested that PMS is seen more commonly in women in their thirties, recent studies report that it is also observed during adolescence and in the years following menarche (Öztürk & Can, 2008).Young women are one of groups most affected by PMS (Tolassa & Bekele, 2014;Eke, Akabuike & Maduekwe, 2011) and changes during the premenstrual period affect young women's academic achievements, class attendance, emotional state, social activitiesand family relationships (Tolassa & Bekele, 2014; Eke, Akabuike & Maduekwe, 2011). Due to its negative effects on everyday life, it is important to scientifically assess the frequency of PMS, factors affecting PMS, methods of coping with PMS, and the groups in which PMS is commonly seen, in order to take the necessary countermeasures. This study was planned to obtain evidence-based data related to the responses of university students to menstruation, problems experienced during menstrual and premenstrual periods, and whether they have sufficient information related to menstruation.

Hence, the study was performed to reveal the frequency of PMS, PMS coping strategies, and factors affecting PMS in university students in Sanliurfa, Turkey.

2. Materials and Method

2.1 Setting and Sample

The study was performed between 26 September and 30 October 2016 and had a cross-sectional design. The study population consisted of 4011 female students in the Osmanbey Campus, Harran University, Sanliurfa, Turkey. After considering studies investigating the

frequency of premenstrual syndrome in Turkish university students (Kısa, Zeyneloğlu & Güler, 2012; Kırcan, et. al., 2012; Tanrıverdi, Selçuk & Okanlı, 2010), the sample size of the study was calculated to be 376 with a frequency of 57.4%, an error limit of 5% and a confidence interval of 95%. A group of reserves was selected equal to 10% of the sample size to replace students who were not present on the day of study and could not be contacted. The students were selected from the student list received from the Student Affairs Department of Harran University using the simple random sampling method.

2.2 Data Collection

The data of the study was collected using the "Personal Information Form" developed by the researchers based on a literature review (Kısa, Zeyneloğlu & Güler, 2012;Bianco, et. al., 2014; Naeimi, 2015; Song, et. al., 2013; Tolassa & Bekele, 2014) and the "Premenstrual Syndrome Scale" (Gençdoğan, 2006), which was used to measure the severity of symptoms during PMS.

2.2.1 Personal Information Form

The form consisted of 59 questions. 12 questions were related to students' socio-demographic characteristics (age, faculty, department, marital status, place of residence for the last five years, cohabitants, parents' educational level, parents' employment status, economic status, family type), eight questions were related to menstrual cycle characteristics (age at menarche, menstruation frequency, duration of menstruation, prior information related to menstruation before menarche, the initial source of information related to menstruation, the sufficiency of information related to menstruation, feelings during menarche, the meaning of menstruation), 21 questions were related to risk factors in the menstrual cycle (weight, height, BMI, presence of a disorder diagnosed by a physician, presence of regular drug use, the most frequently consumed food group, frequency of coffee consumption, frequency of tea consumption, frequency of soft drink consumption, smoking status, alcohol consumption, whether or not the participant adds salt to food without tasting it first, exercise status, presence of tension prior to menstruation, presence of tension prior to menstruation in mother or sister, anemia presence, presence of anger management issues), and 18 questions were related to methods used for coping with the premenstrual syndrome experienced (pain during the period prior to menstruation, water retention, autonomic reactions, negative feelings, lack of concentration, behavioral changes, resurgence, balance/control, increased appetite, and the methods used to cope with these problems).

2.2.2 Premenstrual Syndrome Scale

The "Premenstrual Syndrome Scale" (PSS) developed by Gençdoğan (2006) was used to measure the severity of PMS symptoms. PSS is a five-point Likert scale consisting of 44 items. It is very easy to apply; the subject reads the item and marks one of the options depending on whether or not the symptom is present during the period one week before menstruation. The scale has a total of nine factors: depressive affection, anxiety, fatigue, nervousness, depressive thoughts, pain, appetite changes, sleep changes and bloating.

2.3 Ethical Aspect

The necessary written permits for the study were received from the Ethics Board of Harran University and the Deanships of the relevant faculties and the verbal consent of the participants was also obtained.

2.4 Data Analysis

The Statistical Package for the Social Sciences (SPSS) for Windows 20.0 was used by the researchers for data analysis. Percentage, mean and standard deviation were used as descriptive statistics; the chi-square test and the t test were used as single-variable analyses, and logistic regression analysis was used as a multi-variable analysis in the data analysis section of the study. The findings were interpreted with 95% confidence interval and at a 0.05 significance level.

The PSS is 44-item five-point Likert scale with nine factors (Gençdoğan, 2006). The "never" option is scored as one point, while the "always" option is scored as five points. The minimum and maximum scores possible in each factor are as follows: 7-35 in the depressive affection factor, 7-35 in the anxiety factor, 6-30 in the fatigue factor, 5-25 in the nervousness factors, 7-35 in the depressive thoughts factor, 3-15 in the pain factor, 3-15 in the appetite changes factor, 3-15 in the sleep changes factors and 3-15 in the bloating factor. The minimum possible scale score is 44 and the maximum score is 220. If the subject obtains at least 50% of the maximum score, it is considered that the subject experiences PMS.

3. Findings

The mean age of the study participants was 20.18±1.71, and 42.0% were in the 19-20 age group. 31.9% of the students were enrolled in health-related programs, whereas 68.1% were enrolled in non-health-related programs. 98.9% were single, 55.1% had lived in the city center for the last five years and 58.0% resided in dormitories. 40.7% of the participants had an

illiterate mother, 37.2% had a father who had graduated primary school, 44.9% had lower expenditures than their income, and 66.0% had a nuclear family.

The mean menarche age among the students was 13.60±1.26 and 73.7% had a menarche age between 13 and 15. 53.5% of the students had a menstruation frequency of between 22 and 28 days, and the duration of menstruation was between four and seven days for 86.7%. Also, 97.3% of the students reported a regular menstruation and 81.4% had been informed about menstruation before their first menstruation. 31.6% received their first information about menstruation from their mothers and 58.2% believed that their knowledge regarding menstruation was sufficient. 66.0% of the students experienced fear and panic during their first menstruation and 29.3% stated that menstruation meant leaving childhood/feeling like a woman.

76.6% of the students had a normal body mass index (BMI), 91.5% had no disorder diagnosed by a physician, and among those who had a disorder diagnosed by a physician, 21.9% had high blood pressure and 21.9% had a gynecological disorder. 6.6% of the students used a drug on a regular basis, and 20.0% of these students used iron supplementation.

The most frequently consumed food groups were vegetables and fruit, eaten by 44.9% of the students. 44.1% consumed 1-2 cups of coffee a week, 57.7% consumed 1-2 cups of tea a day, and 40.2% consumed 1-2 cans/glasses of cola a week. In addition, 90.4% of the students were non-smokers, and 33.3% of the smokers reported that they smoked half a pack a day. 99.2% did not consume alcohol, and those who reported that they consumed alcohol drank 1-2 times a year.

75% of the students refrained from adding salt without tasting their food first, 69.7% did not exercise, 95.6% walked frequently, and 44.7% of those who frequently walked reported that they exercised for 30 minutes to 1 hour a day.

65.7% of the students reported that they experienced tension prior to menstruation, 74.9% reported that their mothers had not experienced tension prior to menstruation, while 50.7% reported tension in their sisters prior to menstruation. Also, 57.8% of the students had anemia, 86.2% could not manage their anger, and 39.8% of those who could not manage their anger found it particularly difficult to manage their anger prior to menstruation.

82.4% of the students reported pain during the premenstrual period, while 75.3% reported water retention and 33.0% reported autonomic reaction issues. 61.4% of the students reported negative feelings, 39.1% reported loss of concentration, 51.3% reported behavioral changes, 16.8% reported a resurgence of energy, 28.2% reported balance/control issues, and 41.0% reported increased appetite (Table 1).

Table 1: *Distribution of PMS Symptoms and Sub-group Symptoms Experienced by the Students*

PMS Symptoms	Number	%
Pain		
Yes		
Muscle tension, muscle pain	17	4.5
Headache	4	1.1
Back pain	99	26.3
Fatigue, general pain	61	16.2
Stomachache	129	34.3
No	66	17.6
Water Retention		
Yes		
Weight gains	14	3.7
Spots on the skin and acne	102	27.2
Breast pain or tenderness	44	11.7
Swelling in breast and bloating	123	32.7
No	93	24.7
Autonomic Reaction		
Yes		
Dizziness/fainting	26	6.9
Cold sweats	19	5.1
Nausea/vomiting	39	10.4
Fever	40	10.6
No	252	67.0
Negative Feelings		
Yes		
Loneliness	25	6.6
Anxiety, uneasiness, tension	114	30.3
Mood changes	3	0.8
Crying, sadness, melancholy	86	22.9
Hyperactivity	3	0.8
No	145	38.6
Loss of Concentration		
Yes		
Insomnia	30	8.0
Amnesia, drowsiness, indecisiveness	39	10.4
Difficulty in focusing**,** absence of mind	54	14.3
Confusion**,** minor accidents due to carelessness	20	5.3
Lack of coordination	4	1.1
No	229	60.9
Behavioral Changes		
Yes		
Decreased ability to study or work	83	22.1
Decreased efficiency	5	1.3
Drug use	80	21.3

Staying in bed, not leaving the house	25	6.6
Avoiding social activities	183	48.7
No		
Resurgence of Energy		
Yes		
Excessive displays of affection	10	2.7
Being tidy and organized	5	1.3
Being excited, frantic	14	3.7
Sense of well-being, happiness	4	1.1
Increased energy and activity	30	8.0
No	313	83.2
Balance/Control Issues		
Yes		
Feeling suffocated, heavy	53	14.2
Chest pains, palpitations	40	10.6
Ringing in the ears	3	0.8
Tingling and loss of feeling in extremities	5	1.3
Blurred or impaired vision	5	1.3
No	270	71.8
Increased Appetite		
Yes		
Appetite for chocolate and sweets	73	19.4
Appetite for baked products	1	0.3
Overeating	73	19.4
Appetite for vegetables and fruits	6	1.6
Appetite for dried nuts and chips	1	0.3
No	222	59.0

52.1% of the students were found to have PMS and the mean PSS score was 111.36± 36.11. The mean score obtained by the students was 18.24±7.55 in the depressive affection factor, 14.18±6.21 in the anxiety factor, 17.64±6.06 in the fatigue factor, 13.44±5.78 in the nervousness factor, 16.42±6.94 in the depressive thoughts factor, 8.18±3.12 in the pain factor, 7.69±3.86 in the appetite changes factor, 7.82±3.25 in the sleep changes factor and 7.71±3.68 in the bloating factor (Table 2).

Table 2: *Students' Mean PSS Score and PMS Prevalence*

Factor	Mean±SD	Min-Max	Prevalence
Depressive affection	18.24±7.55	7-35	55.1
Anxiety	14.18±6.21	7-33	26.6
Fatigue	17.64±6.06	6-30	64.9
Nervousness	13.44±5.78	5-25	54.8
Depressive thoughts	16.42±6.94	7-35	43.9
Pain	8.18±3.12	3-15	60.1
Appetite changes	7.69±3.86	3-15	48.9
Sleep changes	7.82±3.25	3-15	54.8
Bloating	7.71±3.68	3-15	46.0
Total	**111.36±36.11**	**44-216**	**52.1**

The students were able to cope with pain, negative feelings, loss of concentration, behavioral changes, a resurgence of energy and increased appetite. However, they were not able to cope with water retention, autonomic reactions and balance/control issues. The most commonly used methods to cope with PMS symptoms included engaging in various activities to expend energy (50.8%), eating sweets (48.1%), using analgesics (33.3%), resting (27.4%), doing things that make one happy (25.5%), walking (10.4%) and drinking lots of water and herbal tea (9.2%) (Table 3).

Table 3: *Distribution of Students Based on PMS Coping Methods*

PMS Coping Method	Number	%
In Case of Pain (n=310)		
Unable to Cope	28	9.0
Using Analgesics	103	33.3
Resting	57	18.4
Keeping Feet Warm, Using a Hot Water Bottle	76	24.5
Other (Drinking Thyme Tea, Cinnamon Tea, Herbal Teas, Sugared Water; Massage etc.)	46	14.8
In Case of Water Retention (n=283)		
Unable to Cope	171	60.4
Using Hot Water Bottle, Taking Frequent Showers	15	5.3
Drinking Lots of Warm Water and Herbal Tea, Resting	26	9.2
Walking	13	4.6
Using Analgesics	13	4.6

Other (Eating Low-salt Food, Eating Less, Using Acne Medicine, Massage, Using Medicine Prescribed by a Physician)	45	15.9
In Case of Autonomic Reaction (n=124)		
Unable to Cope	50	40.3
Reading, Watching TV, Listening to Music	1	0.8
Resting	34	27.4
Taking A Warm Shower	11	8.9
Walking	4	3.2
Other (Using Anti-emetics, Eating Foods that Prevent Nausea)	24	19.4
In Case of Negative Feelings (n=231)		
Unable to Cope	40	17.3
Doing Things That Make One Happy	59	25.5
Reading, Watching TV, Listening to Music	35	15.2
Sleeping	11	4.8
Being Alone	33	14.3
Other (Crying, Praying, Positive Thinking Talking to Others, Eating etc.)	53	22.9
In Case of Loss of Concentration (n=147)		
Unable to Cope	58	39.4
Resting	26	17.7
Sleeping in a Silent Room	22	15.0
Seeking/Receiving Advice	2	1.4
Other (Massage, Listening to Music, Exercise, Drinking Warm Milk, Reading, Taking Notes etc.)	39	26.5
In Case of Behavioral Changes (n=193)		
Unable to Cope	77	39.9
Engaging in Self-motivating Activities	37	19.2
Other (Massage, Listening to Music, Exercise, Resting etc.)	79	40.9
In Case of Resurgence of Energy (n=63)		
Unable to Cope	22	34.9
Self-control (Mental)	8	12.7
Reading, Watching TV, Listening to Music	1	1.6
Engaging in Various Activities to Expend Energy	32	50.8
In Case of Balance/Control Issues (n=106)		
Unable to Cope	54	50.9
Resting in a Silent Room	13	12.3
Sleeping	5	4.7
Walking	11	10.4
Other (Massage, Listening to Music, Exercise etc.)	23	21.7
In Case of Increased Appetite (n=154)		
Unable to Cope	4	2.6
Overeating	50	32.5
Eating Chocolate, Sweets, Baked Products	74	48.1
Eating Vegetables/Fruit	7	4.5
Eating Dried Nuts and Fruits	1	0.6
Sleeping or Engaging in Other Activities to Prevent Eating	18	11.7

Many factors that might affect PMS were analyzed in the study. It was found that the incidence of PMS increased with increasing age (the median age for those with PMS was 20.4, whereas the median age for those without PMS was 19.9) and increasing weight (the median weight for those with PMS was 56.4, whereas the median weight for those without PMS was 54.8) ($p<0.05$). Height, body mass index, age at first menstruation, menstruation frequency, menstruation duration and menstruation regulation had no effect on PMS ($P>0.05$). Also, experiencing tension prior to the menstruation period, tension in the mother and sister prior to the menstruation period and insufficient knowledge and negative attitude towards menstruation had no significant relationship with PMS ($P>0.05$). Frequency of PMS was found to be higher in the students with anemia (63.7%) compared to those without anemia (47.2%) ($p<0.05$).

The incidence of PMS was higher in the students with a lower income (60.4%) compared to those with a higher income level (32.5%) ($P<0.05$). The faculty in which the students were enrolled, marital status, the place where they had lived for the longest period of time, cohabitants, educational level of parents, employment status of parents, family type, presence of a disorder diagnosed by a physician and regular use of medicines were found to have no significant relationship with PMS ($P>0.05$).

The incidence of PMS was higher in those who consumed fast food (66.7%) compared to those who did not (49.4%), and in those who had a high salt consumption (64.9%) compared to those who had a low salt consumption (47.9%) ($p<0.05$). Coffee consumption, tea consumption, soft drink consumption, alcohol consumption, amount of alcohol consumed, smoking, exercise status, exercise type and exercise frequency were observed to have no effect on PMS ($P>0.05$).

A logistic regression model (Backward Stepwise [Conditional]) was created in the study using variables which showed significant difference in single-variable analyses which included age (continuous variable), weight (continuous variable), income level (categorical variable), fast food consumption (categorical variable), salt consumption (categorical variable) and presence of anemia (categorical variable). According to the logistic regression analysis, a unit of increase in age led to an increase of PMS risk by a factor 1.179, whereas a unit of increase in weight led to an increase of PMS risk by a factor of 1.025. Also, a low income increased the PMS risk by a factor of 1.884, fast food consumption by a factor of 2.069, high salt consumption by a factor of 1.884and presence of anemia by a factor of 1.739.

Table 4: *Logistic Regression Model of Premenstrual Syndrome-related Risk Factors in the Students*

Risk Factors	**B**	**P**	**OR**	**95% Cl**
Age	0.157	0.019	1.170	1.02-1.33
Weight	0.025	0.088	1.025	0.99-1.05
Income level (low)	0.633	0.004	1.884	1.21-2.91
Fast food consumption (yes)	0.727	0.021	2.069	1.11-3.83
Salt consumption (high)	0.612	0.019	1.844	1.10-3.07
Anemia (yes)	0.554	0.024	1.739	1.075-2.81
Constant	**-5.775**	**<0.001**	**0.003**	

4. Discussion

PMS is a significant community health problem which is frequently seen in women of reproductive age, affects not only women but also their families and society, disrupts women's mental health, causes a loss of working hours and reduces quality of life (Kırcan, et. al., 2012; Direkvand-Moghadam, et. al., 2014). To consider the negative effects of PMS on women's physical, social, and psychological well-being, we investigated the prevalence of PMS, PMS coping strategies, and factors affecting PMS in nursing students. More than half of the participants were found to have PMS. Studies from around the world report a prevalence of PMSvarying from 12% to 98% (Direkvand-Moghadam, et. al., 2014). The prevalence of PMSreported in Turkish studies with university students, on the other hand, varies from 36.4% to 67.5% (Kısa, Zeyneloğlu & Güler, 2012; Kırcan, et. al., 2012; Tanrıverdi, Selçuk & Okanlı, 2010; Selçuk, Avcı & Yılmaz, 2014; Gümüş, Bayram, Can & Kader, 2012; Yücel, Bilge, Oran, Ersoy, Gençdoğan & Özveren, 2009; Elkin, 2015; Aşcı, Süt & Gökdemir, 2016). While these results indicate differences between PMS prevalence around the world and in Turkey, they also show that PMS is a quite common problem. The differences between the findings may be due to cultural and environmental differences found in different countries and the different data collection tools and samples used in the various studies.

The mean PSS score of the students participating in the study was 111.36±36.11. This indicates that the students experienced PMS symptoms at a moderate to high level. Other studies report a mean PSS score varying from 110.49±32.62 to 121.3±34.02 (Kısa, Zeyneloğlu & Güler, 2012; Erbil, Karaca & Kırış, 2010; Oo, Sein, Mar & Aung, 2016; Selçuk, Avcı & Yılmaz, 2014).

It was found in the study that the students used different methods to cope with PMS symptoms, including using analgesics, engaging in activity, or eating sweets. Most students were able to cope with pain, negative feelings, and resurgence of energy using these methods; however, they were not able to cope with water retention, autonomic reactions, loss of concentration, behavioral changes and balance/control issues. In parallel with our study, a review of the literature reveals that women use various methods to cope with PMS symptoms such as using analgesics, using a hot water bottle, exercise, resting, massaging the abdomen and the waist, and eating chocolate and sweets (Bölükbaş & Tiryaki, 2003; Kısa, Zeyneloğlu & Güler, 2012; Aşcı, Gökdemir & Özcan, 2015). The reason behind the women's choices women in this situation may be the fact that these methods provide quick relief, although they do not help eliminate the problem in the long run.

Studies in the literature suggest a relationship between PMS and numerous variables, including age (Öztürk, Can, 2008; Kısa, Zeyneloğlu & Güler, 2012), presence of PMS in mother and sister (Gençdoğan, 2006; Demir, Algül & Güven, 2006; Dickerson, Mazyck & Hunter, 2003), stress (Nisar, et. al., 2008), BMI (Bertone-Johnson, Hankinson, Willett, Johnson & Manson, 2010; Fujiwara & Nakata, 2007), mother's educational level and employment status (Erbil, et. al., 2011), marital status (Demir, Algül & Güven, 2006; Adıgüzel, Taşkın & Danacı, 2007), insufficient knowledge of and negative attitude related to menstruation (Gençdoğan, 2006; Kırcan, et. al., 2012; Erbil, Karaca & Kırış, 2010; Robinson & Swindle, 2000; Kısa, Zeyneloğlu & Güler, 2012), fast food consumption (Selçuk, Avcı & Yılmaz, 2014), educational and income level (Demir, Algül & Güven, 2006), smoking and alcohol consumption (Bertone-Johnson, et. al., 2010), anemia (Erbil, et. al., 2011) and salt consumption (Bianco, et. al., 2014). In our study, on the other hand, age, weight, income level, fast food consumption, salt consumptionand presence of anemia were found to be factors which had an effect on PMS.

There are numerous studies investigating the relationship between age and PMS (Freeman, 2007; Öztürk, Can, 2008; Kısa, Zeyneloğlu & Güler, 2012). It is known that the severity of symptoms increases with age, decreases with reduced ovarian activity and that symptoms disappear with menopause. It was found in our study that PMS frequency decreased with increasing age, which supports the above-mentioned fact.

Increased weight was found to increase PMS risk in our study. A strong correlation between PMS symptoms and BMI is reported in the literature (Bertone-Johnson, et. al., 2010;

Fujiwara & Nakata, 2007). It is noted that the increase in BMI is directly proportional to swelling in extremities, abdominal cramps, increased back pain, and therefore, increased PMS symptoms.

While it is stated in the literature that fast food consumption triggers PMS (Selçuk, Avcı & Yılmaz, 2014), there is no evidence for this information. In our study, the incidence of PMS was found to be higher among those who consumed fast food. This may be related to increased fat and saturated fat consumption as a result of eating fast food, which consequently causes increased BMI. Indeed, the incidence of PMS is higher in those with higher BMI.

The incidence of PMS was found to be higher in those with a low income in our study. Studies in the literature report that economic status has an effect on PMS (Demir, Algül & Güven, 2006). This may be associated with the negative effects of having a low income level on nutrition and general life conditions.

Students with anemia were found to have a higher incidence of PMS in the study. A study performed with women between the ages of 15-49 reports a higher PMS scale score for those with anemia (Erbil, et. al., 2011). It is believed that the fatigue and weakness caused by anemia may increase the severity of PMS symptoms.

Students with a high salt consumption were found to have a higher incidence of PMS. This may be related to increased water retention due to high salt consumption, which increases the severity of PMS symptoms. Indeed, one study reports that the severity of PMS symptoms increases with a higher sodium intake (Bianco, et. al., 2014).

5. Conclusion

It was found in our study that the prevalence of PMS was high among the students, that factors such as increased weight, low income level, fast food consumption and high salt consumption led to an increased PMS risk, and that the students had particular difficulty in coping with certain symptoms (water retention, balance/control issues and autonomic reactions). On the basis of these results, it is recommended that university students be given information about the factors affecting PMS (nutrition, exercise, lifestyle, habits etc.), how to cope with symptoms (relaxation methods, diets, pharmacological methods etc.) and treatments available, and that they also be encouraged to receive treatment for PMS. It may also be useful to establish health units which utilize pharmacological and non-pharmacological methods to help students

cope with the symptoms of PMS, which will ensure that students have access to professional support in their universities.

In the future study the researcher may test of pharmacological and non-pharmacological methods effectiveness on PMS.

There is no limitation in this study.

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