Original Article

Impact of Healthy Lifestyle Behavior Training in University Students with Premenstrual Complaints

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Abstract

Background: Premenstrual syndrome is a series of pre-predictable physical, cognitive, emotional, and behavioural complaints that occur in the luteal phase of the menstrual cycle.
Objectives : In this study, we have researched the effect of training of healthy lifestyle behaviours on university students with premenstrual symptoms of "smoking, excessive body mass index, lack of regular exercise, alcohol and excessive caffeine consumption, high stress' risk factors on premenstrual complaints.
Methods :. 155 female students attending Burdur Mehmet Akif Ersoy University of Turkey, , were randomly divided into study and control groups. After the initial training of healthy lifestyle behaviours given to the study group, three training sessions were held twice every 4 weeks. The female students have been assessed with risk factor identification form, DASS stress sub-dimension, PSS and HLBS-II before the training and 12 weeks thereafter.
Results : Among the risk factors for premenstrual complaints at the final assessment of the study group; daily caffeine intake and stress level and the number of existing risk factors were found to be less than those of the control group and the time spent for regular exercise was higher. HLBS II score of the study group was found significant in the final assessment, compared to the control group and the Premenstrual Syndrome Scale score was significantly lower than the control group.
Conclusions: In conclusion, we can observe that healthy lifestyle behaviours training improved health behaviours, are effective in decreasing the risk factors for premenstrual complaints and decreased premenstrual complaints.

Keywords: Premenstrual Complaints, Risk Factors, Health Education, Healthy Life Style Behaviours.

Introduction

Premenstrual syndrome is one of the reproductive age problems in women. There are also many risk factors associated with lifestyle behaviours in the occurrence and severity of premenstrual complaints. These are risk factors such as smoking, alcohol use, caffeine consumption, excessive body mass index (BMI), lack of regular exercise and high stress (Lentz, 2007; Hirokawa,2011).

Seedhom et al. have analysed the relationship between premenstrual syndrome and lifestyle factors in university students and found that smoking high BMI, excessive fast food and excessive caffeine consumption increase the premenstrual complaints with (Seedhom, Mohammed & Mahfouz 2013). In a study conducted by Chayachinda et al. with nurses, it was determined that consumption of over one cup of coffee per day increased premenstrual syndrome (Chayachinda, 2008). In a study conducted with Japanese adolescents, smokers were more likely to report premenstrual phase concentration, pain, fluid retention, autonomic reactions, negative emotional problems,

behavioural changes compared to non-smokers, and again the premenstrual phase concentration, fluid retention, autonomic reactions, negative emotional problems, behaviour change were found more than those of the non-smokers (Hirokawa, 2011). We have now more information on that development of healthy lifestyle behaviours may decrease the negative effects of risk factors on premenstrual complaints (Seedhom, Mohammed & Mahfouz, 2013; Chayachinda, 2008; Panay, 2005). However, there is not sufficient experimental study to examine the effect of developing healthy lifestyle behaviours on premenstrual complaints in the literature.

In this study, it is aimed to examine the effect of training of healthy lifestyle behaviours in university students with premenstrual symptoms.

Materials & Methods

Location and Time of the Research: The research was carried out in Golhisar Health Services Vocational School of Mehmet Akif Ersoy University between 28 September 2015 and 08 January 2016.

Purpose and Method of the Study: The aim of the study is to study the effect of training of healthy lifestyle behaviours on university students with premenstrual complaints who have one of the risk factors for premenstrual complaints. The research was conducted as a semi-experimental manner with study and control groups. The study and control group was selected by simple randomization using the single or double numbers method.

Population and Sampling: The population of the research is 333 female students who attend Golhisar Health Services Vocational School of Republic of Turkey Mehmet Akif Ersoy University between September 28, 2015 and January 8, 2016, and have no cyclical irregularities, no oral contraceptive use, no chronic condition, does not have a disability in a way to prevent them from exercising and agree to participate in the research, considering that these may affect the premenstrual complaints.

The study and control group has been created by dividing 155 female students (77 study group and 78 control group) into two groups through a simple randomization via single or double numbers method, who have at least one risk factor (smoking, alcohol use, caffeine consumption more than 200 mg per day, body mass index (BMI) greater than 25 kg/m², lack of regular exercise, having over stress), and have premenstrual complaints and want to maintain the research.

Collection of Data Tools: In line with the literature, in order to collect the data for the research Depression Anxiety Stress Scale (DASS) stress subscale (14 items), and premenstrual symptoms risk factors identification form and student introductory information form, containing the menstruation history and socio-demographic features, prepared by the researcher, and Premenstrual Syndrome Scale (PSS) to identify the presence of premenstrual complaints and Healthy Lifestyle Behaviours Scale II to identify the healthy lifestyle behaviours have been used.

Premenstrual Symptoms Risk Factors Identification Form : This questionnaire, which was prepared by the researcher based on the literature, collected data on BMI, caffeine consumption, smoking, alcohol use, duration of exercise and stress levels.

Height and weight measurements were made to determine BMI. BMI value was calculated from measured weight and height values. A BMI greater than 25 kg / m² was considered a risk factor. The presence of active drinking in order to evaluate cigarette use, if yes, the number of cigarettes smoked per day was questioned. Daily smoking was considered a risk factor. In order to evaluate the use of alcohol, the status of use was questioned, if the answer is yes, the weekly pint was questioned. A pint of alcohol per week was considered a risk factor for alcohol consumption. In order to evaluate daily caffeine consumption, the total amount of caffeine contained was calculated by examining the daily consumed food and/or drink and quantities. Excess caffeine consumption of 200 mg/day was considered a risk factor. The presence of exercise was examined for assessing the status of exercising and if the answer is yes, weekly exercise time has been analysed. No exercising was considered a risk factor. DASS stress sub-dimension was used to determine the stress level, which is a risk factor for premenstrual symptoms. Over-stress was identified as a risk factor **(**Seedhom et al., 2013; Panay, 2005; WHO. Body mass index).

Depression-Anxiety-Stress Scale (DASS) DASS developed by Lovibond and Lovibond in

1995 consists of 42 items (Lovibond & Lovibond, 1995). The scale is a 4-point Likert-type scale. Depression dimension has 14 items, anxiety has 14 items, stress has 14 items, totaling to 42 items in DASS. The high scores of depression, anxiety and stress subscales indicate that the individual has the relevant problem. The scores obtained for each sub-dimension range from 0 to 42. In this study, the stress dimension of the Turkish version of the scale was used (Akın & Cetin, 2007). In this study, Cronbach's alpha coefficient of stress subscale of DASS was found as 0.87.

Premenstrual Syndrome Scale (PSS) : PSS is a 44-item five-point Likert-type scale(never, very few, sometimes, often, always) that was developed by Gencogan in 2006 and measures the severity of premenstrual symptoms. The lowest score that can be taken from the scale is 44 and the highest score is 220. Gencdogan suggests that premenstrual syndrome should be assessed for the presence or absence of PMS scores according to the case of exceeding 50% of the highest score of total and subscale scores (9 Gencdogan, 2006) . The Cronbach's alpha coefficient for the total scores of the PSS on the questionnaire was 0.89.

Healthy Lifestyle Behaviour Scale-II (HLBS-II): The 48-item HLBS developed by Walker et al. in 1987 was revised in 1996 and named HLBS-II **(**Walker & Hill-Polerecky, 1996). The HLBS-II Scale is composed of 52 items and has 6 sub-dimensions. All items of the scale are positive. The rating is in 4-point Likert. The lowest score that can be taken from the scale is 52, the highest score is 208. In this study, the version of which Turkish reliability was conducted, was used (Bahar et al., 2008).

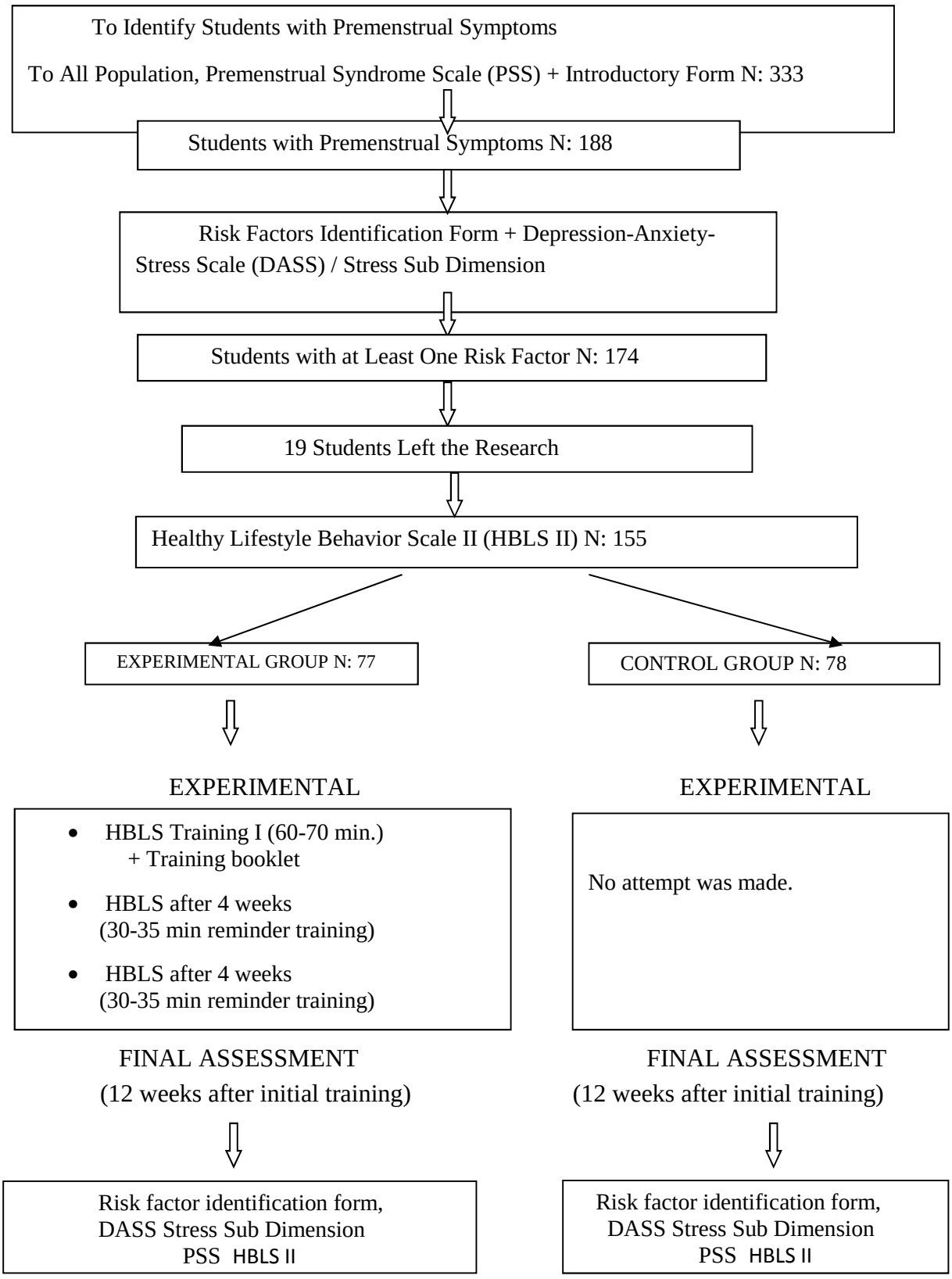
The Cronbach alpha coefficient for the total scores of the HLBS-II was 0.79 in the presented research.

Implementation Process of the Study: The research data was collected by the researcher in the classroom outside the class hours through face-to-face interview method. "PSS" has been applied to 333 students in total to identify the female students with premenstrual complaints via student introductory information form to identify the research sampling in the first phase. It was determined that there were 188 students with premenstrual complaints after this application. To determine the risk factor presence, 186 students were administered the "Premenstrual Symptoms Risk Factors Identification Form, including the stress subscale of DASS". After this assessment, 174 female students with premenstrual symptoms and having at least one risk factor (smoking, alcohol use, consumption of more than 200 mg of caffeine per day, BMI greater than 25 kg / m2, lack of regular exercise and over-stress) were identified. Of the 174 premenstrual complainants with at least one risk factor, 19 said they did not want to continue the research. It was decided that 155 students with at least one risk factor, premenstrual complaints and willingness to continue the research, were divided into two groups. 155 students were applied HLBS-II and they were divided by simple randomisation into study (77 students) and control (78 students) groups by using the single or double numbers method. The students in the study group were first provided with healthy lifestyle behaviours training to combat premenstrual symptoms from the students who were applied to the introductory form, the risk factor identification form, the PSS and the HLBS II (Figure 1) and divided into study and control group. After the initial training, (smoking, alcohol use, caffeine consumption more than 200 mg per day, BMI more than 25 kg / m^2, regular lack of exercise, over-stress) reminder training were held for risk factors twice every four weeks. The control group was not trained. 12 weeks after the initial training given to the students in the study group, Risk Factor Identification Form for Premenstrual Symptoms, containing the stress sub dimension of DASS, PSS and HLBS-II have been repeated for students in the study and control groups with a view to collect the final data(Figure 1)

Assessment of Data :Statistical Package for Social Science (SPSS) 20.0 software package program was used to analyse the data obtained in the research. Assessment of data included number, percentage, Chi Square, Mann-Whitney U test, Friedman's test, Wilcoxon signed-rank test analysis. $\alpha = 0.05$ was accepted.

Permission and Ethics of Research : In order for the study to be carried out, the approval of the relevant institution and ethics committee were taken. The purpose of the study was explained to the students who participated in the research and verbal and written approval was obtained from the participants who accepted the research.

Figure 1: Research Flowchart



Results

The mean age of the participants in the study group was M= 19.23 SD=1.19 and the mean age of the students in the control group was M= 19.34 SD 1.45 and 54.5% of the students in the study group and 53.8% of the students in the control group were having evening education.

There was no statistically significant difference between the groups in a sociodemographic sense (p> 0.05). It is observed that the first period age for the study group students was M= 13.40 SD 1.15 and that of the control group was M= 13.65 SD 1.35 and the menstrual cycle length of the students in the study group was M= 27.91 SD 4.80 and that of the control group was M= 28.83 SD 4.71 and the duration of menstrual bleeding was M= 5.55 SD 1.77 in the study group and M= 5.58 SD 1.32 in the control group. It was also determined that 88.3% of the students in the study group and 88.5% of the students in the control group were dysmenorrhea. There was no statistically significant difference in menstruation characteristics between the students in the study and control groups (p> 0.05).

When the participants in the study and control group included in the study were examined in terms of risk factors for premenstrual complaints before the training, it was found that 11 (14.3%) in the study group with BMI 25 and above, and 7 (9%) in the control group; 14 (18.2%) in the study group and 12 (15.4%) in the control group in the number of smokers; 5 (6.5%) in the study group and 4 (5.1%) in the control group in the number of students consuming alcoholic beverages; 25 (32.5%) in the study group and 28 (35.9%) in the control group, which consume 201 mg and over caffeine per day ; 59 (76.6%) in the number of students who did not regularly exercise, 61 (78.2%) in the control group; and 64 (83.1%) students in the study group and 66 (84.6%) students in the control group who have over-stress. There was no statistically significant difference between the study group and the control group (p> 0.05) when the total number of risk factors (1-5) and the individual risk factors of the students were examined in 6 risk factors effective on premenstrual complaints.

Table 1 compares the sub-dimension and total scores of PSS of the students with premenstrual complaints between the groups prior to the training. There was no statistically significant difference (p> 0.05) between the groups except the bulging sub-dimension (p <0.05)when the total and total sub-dimension scores of the students were compared (Table 1).

The findings of the final assessment of the groups (after 12 weeks of training) were included in Table 2, Table 3 and Table 4.

Table 2 compares the prevalence of premenstrual complaints among the participants in the study and control group for risk factors regarding the premenstrual complaints in the final assessment. There was no statistically significant difference between groups in terms of BMI, smoking, and alcohol consumption (p> 0.05). After the "Healthy Lifestyle Behaviour Training Program", it was determined that the number of caffeine intake, stress level, and present risk factors, which are risk factors for premenstrual complaints, were lower in the study group than the control group students and that the period of regular exercise was higher than the students in the control group (Table 2).

When the HLBS-II scores of the students with premenstrual complaints were compared between the groups after the final assessment made 12 weeks after the training; It was determined that there was a statistically significant difference between the total HLBS-II and all sub-dimension scores of the students in the study and control groups (p <0.05). It was found that the total HLBS-II and all sub-dimension scores of the students in the study group were statistically significantly higher than the students in the control group (Table 3).

Table 4 compares between the groups the total and sub-dimension scores of the PSS of the students in the study and control group included in the study under the final assessment. It was determined that there was a statistically significant difference between the total PSS and all sub dimension scores of the students in the study and control groups (p <0.05). It was found that the total PSS and sub dimension scores of the students in the study group were statistically significantly lower than those in the control group (Table 4).

Table 1: Comparison of PSS total and sub dimension scores of the students in the initial assessment (pre-training) study and control group

PSS and Sub-dimensions	Study group (n= 77)		Control Group (n: 78)		Test and p value
	Mean ±SS	Median/ Min-Max	Mean ±SS	Median / Min-Max	
Depressive emotion	24.35±5.31	24.00/ 9-35	24.35±5.33	25.00/10-35	2936.50 0.811
Anxiety	19.94±5.45	20.00/9-32	20.08±6.29	19.00/7-35	2962.00 0.883
Fatigue	22.62±4.42	22.00/7-30	21.73±4.47	22.00/12-30	2683.50 0.252
Irritability	19.05±3.76	20.00/9-25	17.26±4.90	18.00/8-25	2770.00 0.403
Depressive thinking	21.71±4.98	22.00/11-35	22.35±5.95	22.00/9-35	2773.00 0.410
Pain	10.32±2.47	10.00/4-15	9.87±2.12	10.00/4-15	2598.50 0.144
Appetite changes	9.75±3.56	10.00/3-15	9.88±3.89	11.00/3-15	2909.00 0.735
Sleep changes	9.56±3.20	9.00/3-15	9.42±2.97	9.00/3-15	2999.50 0.990
Bulging	10.89±3.88	12.00/3-15	9.65±3.95	9.50/3-15	244.50 **0.044**
PSS TOTAL	148.10±20.49	148.00/116-206	145.31±22.79	137.50/116-200	2691.00 0.264

Mann-Whitney Utest

Table 2: Comparisons of risk factors for premenstrual complaints among students in the study and control groups at the final assessment (after 12 weeks)

Risk Factors for Premenstrual Complaints			Study Group (n= 77)		Control Group (n= 78)		Test and p alue
			Number	Percentage	Number	Percentage	
BMI	Below 18.50 (thin)		9	11.7	18	23.1	X^2=4.315
	18.50-24.99 (normal)		59	76.6	53	67.9	P = 0.229
	25.00-29.99 (overweight)		6	7.8	6	7.7	
	30.00 and over (obese)		3	3.9	1	1.3	
	Risk factor (n)	Yes	9	11.7	7	9.0	X^2=0.308
		No	68	88.3	71	91.0	p=0.579
Smoking	None		61	79.2	60	76.9	X^2=6.519
	1-6 units per day		9	11.7	7	9.0	P=0.089
	7-12 units a day		4	5.2	11	14.1	
	13 days and over a day		3	3.9	0	0	
	Risk factor (n)	Yes	16	20.8	18	23.1	X^2=0.119
		No	61	79.2	60	76.9	p=0.730
Consumption of alcoholic beverages	No		73	94.8	72	92.3	X^2=0.400
	Yes		4	5.2	6	7.7	p=0.527
	Risk factor (n)	Yes	4	5.2	6	7.7	X^2=0.400
		No	73	94.8	72	92.3	p=0.527
	0-50 mg		15	19.5	5	6.4	X^2=13.106

Caffeine	51-200 mg		47	61.0	39	50.0	**p=0.001**
	201 mg and over		15	19.5	34	43.5	
	Risk factor (n)	Yes	15	32.5	34	43.5	X^2=10.418
		No	52	67.5	44	56.4	**p=0.001**
Training	Never		23	29.9	52	66.7	X^2=24.824
	30 min-150 min per week		32	41.6	13	16.7	P=**0.000**
	151 min-300 min per week		17	22.1	6	7.7	
	301 minutes and over a week		5	6.5	7	9.0	
	Risk factor (n)	Yes	23	29.9	48	61.5	X^2=15.654
		No	54	70.1	30	38.5	p=**0.000**
Stress level (DASS)	Normal		33	42.9	12	15.4	X^2=21.756
	Light		13	16.9	14	17.9	P=**0.000**
	Medium		23	29.9	23	29.5	
	Advanced		7	9.1	25	32.1	
	Very advanced		1	1.3	4	5.1	
	Risk factor (n)	Yes	44	57.1	66	84.6	**X^2=14.194**
		No	33	42.9	12	15.4	**p=0.000**
Available risk factor number	0		16	20.8	2	2.6	
	1		28	36.4	14	17.9	
	2		20	26.0	26	33.3	
	3		10	13.0	28	35.9	**X^2=27.637**
	4		2	2.6	7	9.0	**p=0.000**
	5		1	1.3	1	1.3	

Chi-square test

Table 3: Comparison of the sub-dimension and total scores of the HLBS-II in the study and control groups at the final assessment (after 12 weeks)

	Study group (n= 77)		Control Group (n=78)		
HLBS II and Sub-dimensions	**Mean ±SS**	**Median/ Min-Max**	**Mean ±SD**	**Median / Min-Max**	**Test and p value**
Health Responsibility	22.42±5.27	21.00/11-35	18.22±5.29	18.00/9-31	U:1725.00 p:**0.000**
Physical Activity	19.03±5.75	19.00/8-30	14.90±4.60	14.00/8-26	U:1754.00 p:**0.000**
Nutrition	22.35±4.37	23.00/10-33	18.78±3.73	19.00/11-27	U:1614.00 p:**0.000**
Spiritual Growth	28.90±3.84	26.00/19-35	23.82±3.65	23:50 / 17-33	U:1039.00 p:**0.000**
Interpersonal Relationships	28.65±4.29	29.00/18-36	24.56±3.71	25.00/15-33	U:1315.00 p:**0.000**
Stress Management	22.16±4.17	22.00/13-29	18.38±3.75	18.00/11-28	U:1435.00 p:**0.000**
HLBS II TOTAL	143.51 ±19.07	143.00/92-188	118.67±17.66	114.00/84-157	U:1034.00 p:**0.000**

Mann-Whitney U test

Table 4: Comparison of PSS total and sub dimension scores of the students in the study and control groups after the final assessment (after 12 weeks)

	Study Group (n= 77)		Control Group (n= 78)		Test and p value
PSS and Sub-dimensions	Mean ±SS	Median/ Min-Max	Mean ±SS	Median / Min-Max	
Depressive emotion	18.94±6.10	19.00/7-30	23.62.±5.53	23.00/12-35	U:1776.00 p:**0.000**
Anxiety	15.61.±5.72	15.00/7-26	20.26.±6.64	21.00/7-34	U:1824.00 p:**0.000**
Fatigue	16.88±5.59	16.00/ 7-30	21.14.±4.58	20.50/12-30	U:1693.50 p:**0.000**
Irritability	13.68±5.11	14.00/5-25	17.25±4.90	18.00/8-25	U:1853.00 p:**0.000**
Depressive thinking	15.96±5.46	15.00/ 7-34	22.63.±6.06	23.00/8-35	U:1213.50 p:**0.000**
Pain	7.68.±3.08	8.00/3-14	9.97.±2.85	10.00/3-35	U:1751.00 p:**0.000**
Appetite changes	7.45.±3.21	7.00/3-15	10.73.±3.81	11.50/3-15	U:1550.00 p:**0.000**
Sleep changes	7.29±3.28	7.00/3-15	9.73±3.02	10.00/4-15	U:1754.00 p:**0.000**
Bulging	8.26.±3.56	8.00/3-15	9.90.±3.81	10.50/3-15	U:2238.00 p:**0.006**
PSS TOTAL	110.35±28.56	111.00/58-178	145.23±27.95	145.00/90-203	U:1156.50 p:**0.000**

Mann-Whitney U test

Discussion

Many risk factors are defined in the literature in terms of premenstrual complaints. Among these risk factors, we can list the most common lifestyle related smoking and alcohol use, unhealthy diet, excessive caffeine intake, sedentary lifestyle and excessive stress (Asci & Sut, 2016; Kaya & Golbası 2016; Pinar, Colak & Oksuz, 2011; Isik et al., 2016). In the study of premenstrual syndrome and quality of life in female students who were receiving health education by Isık et al, it is observed that bad nutrition habits such as fast food and irregular breakfast, low BMI, alcohol and 2 cups and over coffee consumption per day significantly increased premenstrual syndrome risk (Isik et al., 2016). Studies have shown that there is a relationship between high stress level and premenstrual complaints (Lee & Im, 2016; Lustyk et al., 2004). The behavioural risk factors determined for this study comply with the literature. In this study, in the comparison of risk factors for premenstrual complaints, the number of daily caffeine intake, stress level, and present risk factors were found to be statistically significantly lower than the control group in the final assessment (after 12 weeks of training) of the students in the study and control group and regular exercise period was statistically significantly higher than the control group (Table 2). In the literature, there has been no study to re-evaluate the risk factors after the training on premenstrual complaints. In the comparison of scores of final assessment study and control groups from the HLBS-II the total HLBS-II and all sub-dimension scores of the study group were found to be statistically higher than the control group (Table 3). In a study conducted by Chau and Chang to determine the effect of the training program on premenstrual syndrome among adolescents, it was determined that the students in the study group increased their knowledge about premenstrual syndrome self-care measures

and that their school performance and social-familial relationships have been increased (Chau & Chang, 1999). It has been observed that not having physical activity and regular exercise reduces premenstrual complaints in studies conducted (Sabaei. 2015; Samadi, Taghian & Valiani, 2013). In a study where the relation between cardio-respiratory health, physical activity habits, BMI and premenstrual syndrome is analysed, a negative correlation was found between exercise and physical and psychological premenstrual symptoms. It was observed that there was a positive correlation between BMI and physical and psychological premenstrual symptoms (Haghighi, Jahromi & Daryano-Osh, 2015). There is a similarity between the research findings and the literature.In the comparison of the scores obtained from the PSS by the control group and the study group in the final assessment, it was found that the total PSS and all sub-dimension scores of the study group were statistically significantly lower than those of the control group (Table 4). In a study of young girls in Saudi Arabia analysing the effect of training on the knowledge and practices of complementary and alternative medicine methods in the management of premenstrual syndrome, it has been observed that the number of the students who have a right information about the complementary and alternative medicine practices in management of the premenstrual complaints, physical and psychological symptoms, experienced in the premenstrual period, time of the menstrual cycle and the definition of the premenstrual syndrome has significantly increased after the training in comparison to the pre-training. In addition, it has been determined that diet changes, vitamin supplements, herbal applications, yoga, prayer, music and other artistic activities and massage and warm shower of the students which are alternative and complementary medical practices used in the management of premenstrual symptoms have significantly increased after the training in comparison to pre-training (Habib et al., 2014). In the study conducted by Elmalky and Ebrahem on effects of psycho-education provided as a nursery application on the premenstrual syndrome and self-efficacy in adolescence that was carried out with 60 students, it was observed that the adolescents in the training group who were applied psycho-education program increased their self-efficacy in managing premenstrual symptoms in comparison to the students in the control group and their premenstrual symptoms was statistically significantly decreased (Elmalky & Ebrahem 2015). As you can see, the research findings and the literature research findings are similar. Healthy lifestyle behaviours are effective in reducing premenstrual complaints.

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