ZKTB ORIGINAL RESEARCH

The Effect of A Sleep Hygiene Interventions in Women with Premenstrual Syndrome

Premenstrual Sendromlu Kadınlarda Uyku Hijyen Girişimlerinin Etkisi

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ABSTRACT

Objective: *This research aims to reveal the influence of sleep hygiene interventions on premenstrual syndrome.*

Material and Methods: *In the study was used a pre-test post-test non-randomized, control group desing. This study, which was included a total of 88 (intervention group n=47; control group n=41) women with PMS. The intervention group participants were used sleep hygiene intervention. In the first step, the participants in the intervention group received sleep hygiene education. In the second step, the participants of the intervention group used the sleep hygiene intervention for two menstrual cycles. Data were obtained by using premenstrual syndrome scale (PMS scale) and Pittsburgh Sleep Quality Index (PSQI) in pre-intervention and post-intervention (1th menstruation and 2nd menstruation period).*

Results: *The results obtained from the study showed that there was no significant difference between two groups, both the 1st menstruation and 2nd menstruation PSQI scores (p>0.05) and PMS scale score (p>0.05). Nevertheless, when the differences in the 1th menstruation and 2nd menstruation PMS scale scores of the two groups were compared, a statistically significant improvement was detected (p<0.001).*

Conclusion: *Sleep hygiene intervention may be useful to reduce premenstrual symptoms in women.*

Keywords: *premenstrual syndrome, sleep hygiene intervention, sleep hygiene education, pittsburgh sleep quality index*

ÖZET

Amaç: *Çalışma premenstrual sendromda uyku hijyen eğitimlerinin etkisini değerlendirmeyi amaçlamıştır.*

Gereç ve Yöntemler: *Çalışmada, pre-test post-test, non-randomize, control grup tasarım kullanıldı. Çalışma, premenstrual sendromlu 88 kadınile gerçekleştirildi (Girişim grubu= 47; Kontrol Grubu n=41). Girişim grubunda yer alan katılımcılar uyku hijyen girişimlerini kullandı. Çalışmanın birinci adımında, girişim grubunda yer alan katılımcılara uyku hijyen eğitimi yapıldı. İkinci adımda, girişim grubundaki katılımcılar iki menstrual siklus boyunca uyku hijyen girişimlerini uyguladılar. Veriler, girişim öncesi ve girişim sonrası (1.menstruasyon ve 2.menstruasyon) Premenstrual Sendrom Ölçeği (PMSÖ), Pittsburgh Uyku Kalitesi Ölçeği (PUKÖ) kullanılarak elde edildi.*

Bulgular: *Çalışmadan elde edilen bulgular sonucunda, girişim grubunun ve control grubunun hem PMSÖ puanları hem de PUKÖ puanlarının takip sürecinde benzer olduğu, gruplar arasında istatistiksel olarak anlamlı düzeyde fark olmadığı belirlendi (p>0.05).*

Bununla birlikte, 1.menstruasyon ve 2.menstruasyon PMSÖ puan farkları gruplar arasında karşılaştırıldığında, gruplar arasında istatistiksel olarak anlamlı fark bulunduğu belirlendi. Deney grubunun PMSÖ puanları, takip sürecinde, kontrol grubuna göre istatistiksel olarak anlamlı düzeyde azalmıştı (p<0.001).

Tartışma: *Premenstrual semptom yaşayan kadınların, uyku hijyen girişimlerini kullanması, premenstrual semptomlarının azaltılmasında yardımcı olabilir*

Anahtar Kelimeler: *premenstrual sendrom,uyku hijyen girişimleri,uyku hijyen eğitimi*

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INTRODUCTION

Premenstrual disorders, also known as premenstrual syndrome (PMS), are comprised of a group of affective, behavioral, cognitive and physical symptoms which develop on a cyclical basis in the luteal phase of the menstrual cycle and go away within a several days of the beginning of menstruation (1, 2). About one fifth of women suffer from moderate to severe levels of premenstrual symptoms which they perceive to be harrowing and which have a considerable impact on their business and / or social life (3). In several studies it has been indicated that PMS is frequently observed disorder which affects around 8.75–51 % women (4, 5) The PMS prevalence among adolescent women is 61.4% - 72.1% in Turkey (6).

It has been reported that women experienced fatigue, general physical discomfort, nervous derangement and stress, sleepiness, decreased concentration and cognitive impairment, change in mood, social withdrawal and such problems during their premenstrual cycle (2, 6-9).

Sleep disturbance were also associated with the symptoms of PMS. Sleep is commonly disturbed during the premenstrual period. Prevalence of sleep disturbance (hypersomnia or insomnia) in women with PMS varies from 15.4% to 75.6 % in several studies (5, 6, 10). The ovulatory menstrual cycle characteristically has fluctuating levels of reproductive hormones in a period of 25–35 days, and there is an association between these fluctuations and changes in sleep (11). Various studies have attempted to reveal the relation between PMS and quality of sleep in the past. A few studies have indicated poor sleep quality in women affected by PMS symptoms (5, 10, 12-14). According to studies that use subjective sleep reports of women, the premenstrual week and the first days of the beginning of menstruation display indications of sleep disturbance (hypersomnia or insomnia, and fatigue and disturbing dreams) when compared with the other stages of the cycle (12-14). PMS may respond to non-pharmacological intervention, such as stress management strategies, sufficient rest, regular aerobic exercise, well-balanced diet education on sleep hygiene (9).

Recently, one of the methods used for resolving sleep disturbances is sleep hygiene interventions (SHI). Sleep hygiene was originally used by Hauri in 1997 (15) with respect to giving recommendations to patients in order to help them recover from insomnia. SHI stands for developing positive personal sleep habits (15, 16). It is a behavioral therapy, and it can be used to cure insomnia, remedy the quality of sleep and diminish sleepiness during the day (17-19).

Therefore, providing better sleep quality for women with severe PMS is an important issue. Nevertheless, as far as the authors know, no researches have evaluated the impacts of SHI in women with PMS before.

The purpose of the study was to determine the effect of sleep hygiene interventions on premenstrual syndrome.

MATERIAL AND METHOD

Research Hypothesis

Hypothesis 1: The post-training Pittsburgh Sleep Quality Index (PSQI) scores of the sleep hygiene group will be lower than the pre-training scores.

Hypothesis 2: The post-training Premenstrual Syndrome Scale (PMS scale) scores of the sleep hygiene group will be lower than the pre-training scores.

Design and Participants

In this study we used a pre-test post-test non-randomized, control group design. A total of 350 eligible participants who were studying in their 2nd and 3th years in the nursing department of two different universities in Istanbul. The study did not involve first-year students because of the adaptation problems. Senior students were not included in this study because of they were at the hospital for internship.

The sample size was determined with power analysis, and each group needed a total of 36 participants (p=0.05, power level = .80 with PMS scale score differences = %22.5).

A total of 171 participants met the inclusion criteria (Sleep Hygiene Group (SHG) = 92; Control Group (CG) =79). However, only 88 (SHG =47; CG=41) participants completed the study. A total of 83 participants were excluded. Figure 1 summarized the process of the research.

Inclusion criteria

- Aged between 18 and 24 years.
- Having regular cycles of menstruation lasting for 22-35 days over the past 12 months,
- Not to work,
- Not to use combined oral contraceptive pill, hypothalamic hormones or antidepressants during previous six months.
- No mental illness.
- Not to have any endocrinological disorder such as diabetes mellitus or cardiovascular disease or chronic kidney or liver disease
- Not to have a treatment for premenstrual symptoms.
- To experience symptoms of moderate PMS (score: 83-129) or severe PMS (score ≥130) according to cluster analysis results obtained from PMS scale performed during sample selection.

Data Collection and Materials

Data were obtained in pre-intervention and post-intervention periods (1th menstruation and 2nd menstruation period).

Premenstrual Syndrome Scale (PMS scale) and Pittsburgh Sleep Quality Index (PSQI) were utilized in the study. The data of the SHG and CG were collected simultaneously.

Premenstrual Syndrome Scale (PMS Scale)

The scale of PMS was evolved and validated by Gençdoğan in 2006 [20]. It was developed for Turkish women in order to measure symptoms occurring in premenstrual period and to identify the severity of premenstrual syndrome. This scale is widely used commonly in Turkey (6, 10). The PMS scale has 44 items. The scoring is carried out on a Likert scale of 5 points. The item scores range from 1 to 5 as "never", "rarely", "sometimes", "often", and "always", respectively. The total score from the PMS scale is used to determine the severity of PMS. The score that can be obtained on the scale is between 44 and 220. Higher scores mark higher levels of severity for PMS. There is no cut off point for original scale. The PMS scale scores obtained from participants was analyzed by cluster analysis and the score ranges for mild, moderate and severe PMS were found. In this study, PMS scale was filled by all participants during pre-intervention. PMS scale scores for each eligible participants (n=350) were calculated and cluster analysis was done. Three different groups were defined due to the severity levels of the symptoms after cluster analysis of the gained data. Scores between 0-82 was accepted as mild PMS, scores between 83 and 129 was moderate PMS and scores between 130 and 220 was severe PMS.

The Cronbach's α was given as 0.75 in the original trial for the total PMS scale (19). The Cronbach's α for this research was 0.80.

Pittsburgh Sleep Quality Index (PSQI)

The quality of habitual sleep over the previous month was measured using the PSQI, a questionnaire including of 19 items. There are seven subscales of the index, which assess habitual sleep duration, nocturnal sleep discomforts, sleep latency, sleep's quality, daylight dysfunction, sleep drug usage, and performance of sleep. Each subscale has a possible score ranging from 0 to 3, as well as an overall global score from 0 to 21. Obtaining a score of ≥5 or more signifies poor-quality sleep (21). The Turkish version of PSQI has been confirmed as reliable and validated by Ağargün et al. in 1996 (22). The original study had an internal consistency reliability coefficient of .80 [20]. The Cronbach's α of the Turkish version of PSQI was previously calculated as .80 (22). In the present study the Cronbach's α was .78.

Intervention

Sleep Hygiene Group

In the first step, the participants in the SHG received sleep hygiene education (SHE). In the second step, the participants of the SHG used the SHI for two menstrual cycles.

Sleep hygiene education

Sleep hygiene education, which took a total one hour, was given by the researcher (first and second authors). The aim of SHE was to raise knowledge levels of participants in the SHG about sleep and to improve their sleep qualities by providing application of SHI.

The following topics were addressed in SHE; sleep structure, the number of sleeping hours required and individual variations, sleep as a reflection of daytime activities and vice-versa, the influence of bedroom air conditioning, the temperature of room and voices should be optimized to ensure relief, sleep habits (e.g. regular bed times or wake up times, abstaining from napping in bed), anxiety, the impact of dietary habits, alcohol and tobacco use on sleep, the significance of exercise for satisfactory sleep, getting up at the same time on each day, including weekends. Sleep hygiene interventions also were in the SHE.

Sleep Hygiene Interventions

Sleep Hygiene Interventions refers to developing good personal sleep habits (15). It is a behavioral therapy, used to cure insomnia, remedy the quality of sleep, and lessen daylight sleepiness (17-19). The SHI list was firstly suggested by Hauri (15) and then was revised by Friedman et al. (16).

The following revised SHI list was used in this study.

1. Pursue regular physical activity, such as walking, but avoid vigorous exercise within a few hours before going to sleep.
2. Eliminate noise from bedroom.
3. Regulate temperature of bedroom.
4. Light snack at bedtime.
5. Use the bedroom only for sleeping
6. Avoid caffeine
7. Avoid alcohol
8. Limit liquids before bed.
9. Relaxing activities before bed.
10. Leave bed if awake.
11. Use the bedroom only for sleeping (16).

Control Group

In the CG participants were not implemented SHE and did not use SHI.

Ethics

The research was confirmed by the Ethics Committee of University of the Marmara (Protokol No: MAR-YÇ-2009-0268). The study was also approved by the faculty's administration. The aims and stages of this study were explained to participants by researchers. Participants were assured that they could with draw from the research at any time. Informed consent form was obtained by authors from volunteer participants.

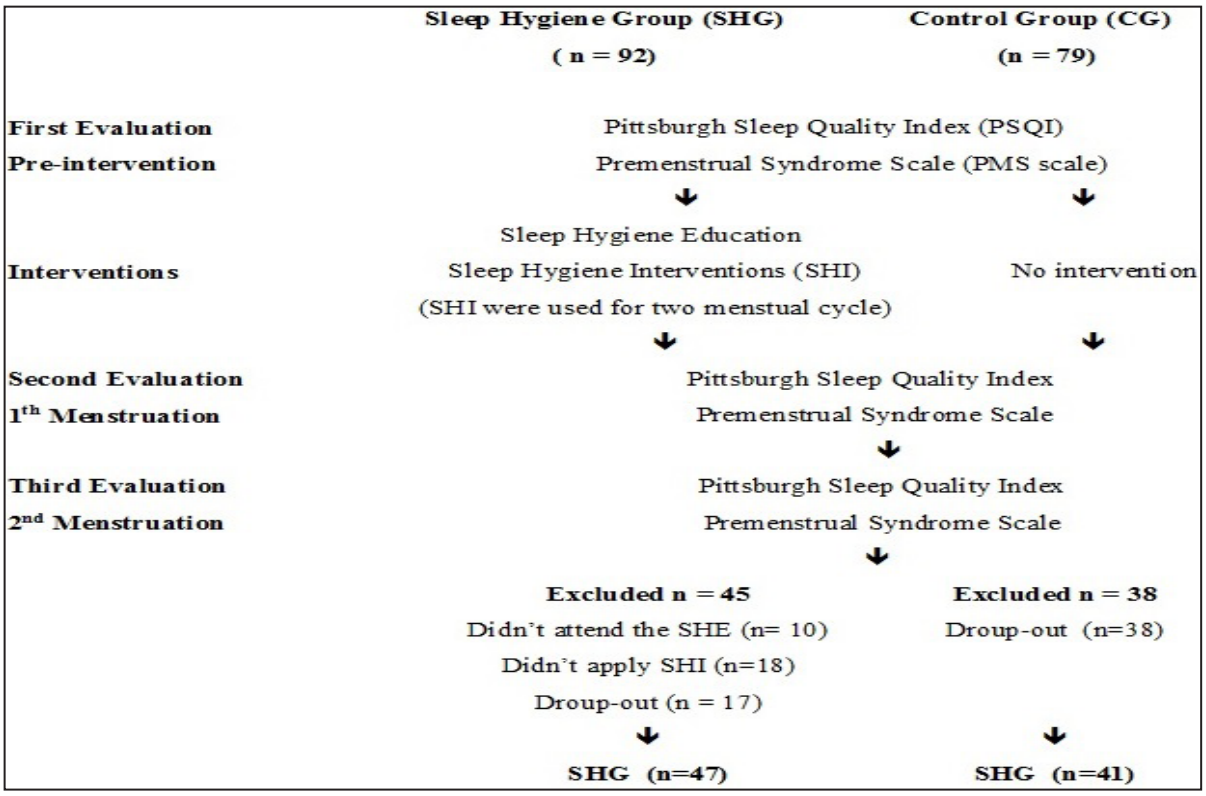

Figure 1: Flow Diagram The Process of the Study.

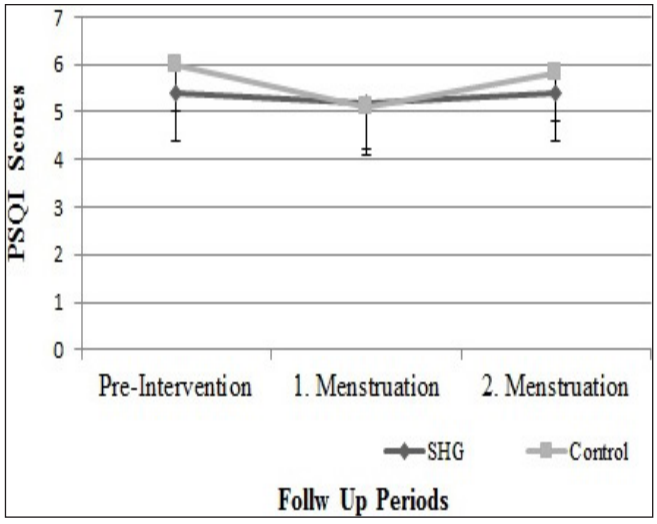

Figure 2: PSQI Scores.

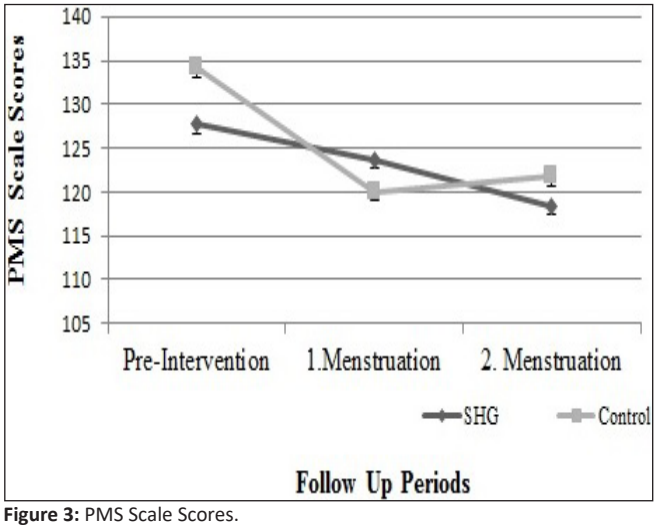

Figure 3: PMS Scale Scores.

Table 1: The Main Characteristics of Participants.

	SHG (n=47)	CG (n=41)		
Variable	**Mean ± SD**	**Mean ± SD**	**Test Statistic**	**P Value**
Age in years	20.2 ± 1.3	20.1 ± 2.1	t= - .11	0.91[a]
Menarche age in years	13.1 ± 1.2	13.3 ± 1	t= .61	0.54[a]
BMI, (kg/m^2)	20.2 ± 2.14	20.8 ± 1.72	t= .42	0.34[a]
Mean sleeping hours on day	6.9 ± 0.97	6.8 ± 1	t= - .28	0.77[a]
	n (%)	**n (%)**		
Accommodation at dormitory	27 (57.4)	18 (43.9)	x^2= 5.2	0.15[b]

a= Independent sample t-test; b= Chi square test. SD, standard deviation; BMI, body mass index.

Table 2: PMS Scale and PSQI Scores.

	SHG (n=47)	CG (n=41)		
PSQI Scores	**Median (quartiles)[a]**	**Median (quartiles) [a]**	**Test Statistic**	**Pvalue**
Pre - Intervention	5 (4 - 7)	6 (4 – 8)	Z= -1.1	0.25[b]
1th Menstruation	5 (3 – 7)	6 (3 – 7)	Z= -.076	0.93[b]
2nd Menstruation	5 (3 - 7)	5 (4 – 7)	Z= -.53	0.59[b]
PMS Scale Scores	**Mean ± SD**	**Mean ± SD**		
Pre-Intervention	127.7 ± 27.2	134 ± 26.5	t = 1.09	0.27[c]
1th Menstruation	123.7 ± 28.9	120 ± 32.2	t = -.57	0.56[c]
2nd Menstruation	118.4 ± 32.1	121.7 ± 34.5	t = .46	0.64[c]

a = Median (quartiles (25th and 75th percentile)), b= Mann Whitney – U test, c= Independent sample t-test SD, standard deviation; PMS, Premenstrual Syndrome; PSQI, Pittsburgh Sleep Quality Index

Table 3: Comparison of the Differences Between PMS Scale Scores.

PMS Scale Scores DifferenceS	**SHG (n=47) Mean ± SD**	**CG (n=41) Mean ± SD**	**Test Statistic**	**Pvalue**
Pre-Intervention - 1th Menstruation	4 ± 24.6	14 ± 30.6	t = 1.6	76.5 [a]
Pre-Intervention - 2nd Menstruation	9.3 ± 28	12.3 ± 32.3	t = .45	0.64 [a]
1th Menstruation - 2nd Menstruation	5.3 ± 21.6 9 (6-17)[c]	-1.7 ± 9.1 0 (4.5-1.5) [c]	Z= -2.6	*<0.001* [b*]

a= Independent-Sample t-test; b= variables were analyzed using Mann Whitney – U; c = Median (quartiles (25th and 75th percentile)), SD, Standard Deviation; PMS, Premenstrual Syndrome. *=Significant at the p<0.001 level.

Statistical Analysis

The data analysis was made using the SPSS 14.0 package program (Institute, Chicago, IL, USA). To determine whether the SHG and CG were similar of main characteristics chi-square test, Fisher exact test and independent samples t-test were used.

Since PMS scale scores of the participants' were on normal distribution independent sample t-test used in statistical analysis. Since PSQI scores of the participants' were on non-normal distribution, Mann-Whitney U test used in statistical analysis Comparison of the PMS scale scores differences for two groups was performed with Mann-Whitney U test or independent samples t-test. For all comparisons made in this study, alpha score of .05 was accepted as statistically significant.

RESULTS

The study participant's main characteristics are shown in Table 1. The mean age of SHG and CG were 20.2±1.3 and 20.1±2.1 years, respectively. There were no significant differences in age, menarche age, body mass index (BMI), staying at dormitory and sleep duration between two groups ($p>0.05$) (Table 1).

The comparison of PMS scale and PSQI score are presented on Table 2. The pre-intervention PSQI scores were similar in two groups. There was no significant difference between two groups, both the 1st menstruation and 2nd menstruation PSQI scores ($p>0.05$). PSQI scores of the SHG did not show a statistically significant alteration during the follow-up periods ($p>0.05$) (Table 2; Figure 2). The pre-intervention PMS scale scores were similar in two groups. The PMS scale scores of the 1st and 2nd menstruation did not significantly reduced for two groups (Table 2).

While PMS scale scores of SHG participants decreased on during the follow up, whereas PMS scales of control group participants firstly decreased and then increased (Figure 3).

Nevertheless, when comparing the differences between PMS scale scores, a statistically significant improvement was detected between 1th menstruation and 2nd menstruation in the SHG ($p<0.001$). (Decrement in PMS scale scores for SHG between 1th and 2nd menstruation was 5.3 ± 21.6; increment in PMS scale scores for control group between 1th and 2nd menstruation was -1.7 ± 9.1) (Table 3).

DISCUSSION

Although there are many studies using the SHI on sleep problems in the literature (15, 16), this is the first article to evaluate the effect of SHI on PMS.

Our results showed that the PSQI scores of both groups did not differ significantly during the follow-up period. Similarly, in a study, it has been stated that sleep hygiene education increases sleep knowledge but is less effective on improvement of positive sleep behaviors (23). According to our results, effective and long-term SHE might be recommended in order to improve the subjective quality of sleep.

According to the results of our trial, the PMS scale scores of the 1st and 2nd menstruation periods did not differ significantly for both groups. Nevertheless, when the differences of PMS scale scores of two groups between 1st and 2nd menstruation were compared, it was determined that PMS scale scores for SHG were decreased significantly during follow up period. It was also interesting that PMS scale scores in the SHG showed a significant decrement on a regular basis both in the 1st and 2nd menstruation; however, no statistically significant change was observed in the PSQI scores of the SHG. This reveals that SHI is effective on decreasing PMS symptoms but it has no adequate effect on increasing subjective sleep quality. A possible explanation for this might be the recommendations of the SHI such as decreasing intake of caffeine, increasing exercise. Overall, these recommendations are directed towards avoiding individual behavior intruding into a normal sleep pattern, or engaging in attitude that contribute to good sleep (19). Although some studies recommend lifestyle modifications (more exercise, lower intake of caffeine, salt, and refined sugar for relief of PMS symptoms), there is no available evidence to confirm those recommendations. One literature review found that exercise was effective on PMS symptoms (24).

As stated in the literature, exercise releases endorphins. Women who regularly do sports suffer from lower levels of premenstrual complaints. After 6 months of prospective monitoring, it was shown that introducing women who have sedentary lifestyles to regular exercise is beneficial for mood symptoms, fluid retention and tenderness of breast (25). It could not be announced that this situation is a direct or indirect effect of SHE application. In the light of the findings, there is need for more randomized controlled, objective and long term trials that can manifest the effect of SHI on PMS syndrome.

Limitations

The limitation of this study was that there were low number of participants and the follow-up period was short. Therefore, findings cannot be extrapolated to the general population.

CONCLUSION

The aim of this study was to determine the effect of sleep hygiene interventions on premenstrual syndrome. The effect of SHI on PMS is controversial. Obtained results reveal that SHI is inadequate to increase the subjective sleep quality but it may decrease PMS symptoms. This study could serve as an idea for another study designation to evaluate for PMS.

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