Effect of Receiving Sessions about Sleep Hygiene Practices on Quality of Sleep Pattern, Insomnia and Academic Achievement among Nursing Students with Primary Dysmenorrhea

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Abstract

Background: Obtaining healthy sleep is important for both physical and mental health, improving productivity and overall quality of life, especially, among girls with primary Dysmenorrhea. ***Aim of the study****:* This study aimed to explore the effect of sleep hygiene practices on quality of sleep pattern, insomnia and academic achievement among nursing students with primary Dysmenorrhea ***Design***: Quasi-experimental research design. ***Sample****:* A purposive sample of 106 female nursing students. ***Setting:*** This study was carried out at Faculty of Nursing, Mansoura University, Dakahlia Governorate, Egypt, from March 2021 to May 2021. **Tools**: Data was collected through six tools, *basic data structured* interview schedule, Pittsburg Sleep Quality Index (PSQI), Insomnia Severity Index, Scale of Positive and Negative Experience (SPANE), Flourishing Scale and Sleep hygiene practices questionnaire. **Results**: This study reported highly statistically significant differences between the study and control groups after intervention in terms of sleep quality, severity of insomnia, subjective feelings of well-being and ill-being, psychological well-being, academic achievement and sleep hygiene practices (P=<0.0001). **Conclusion*:*** this study concluded that receiving sessions about sleep hygiene practices has a greater significant impact on experiencing good sleep quality, less insomnia, more positive feelings of well-being and less negative feelings of ill-being, more psychological wellbeing, better academic achievement, and better sleep hygiene practices among nursing students with primary dysmenorrhea.

Keywords: Sleep Hygiene Practices, Quality of Sleep Pattern, Insomnia, Academic Achievement, Primary Dysmenorrhea

Introduction:

Getting enough sleep is a basic human need and a natural part of life that improves physical health (National Heart, Lung And Blood Institute, 2021). Sleep- wake circadian rhythms are regulated by a pacemaker in the brain and controlled by some external factors, including light; temperature, and social interaction (Suni, 2020). However, sleep and wakefulness patterns have many variations in terms of age, physiological and psychological characteristics as well as somatic and psychiatric disorders, in addition to demands of occupation. These patterns are affected by social requirements of modern life in recent decades (Mograss et al, 2021).

Menstrual disturbances have negative impacts on the girls' quality of life, particularly Dysmenorrhea, which is usually defined as painful menstruation. Dysmenorrhea may be accompanied by backaches, nervousness, headache, fatigue, weight gain, nausea and vomiting as well as breast tenderness. It is associated with absence from school, and restriction from activities (Arafa et al, 2018).

Sleep hygiene means having both a bedroom environment and daily routines that promote consistent, uninterrupted sleep. Keeping a stable sleep schedule, making bedroom comfortable and free of disruptions, as well as following a relaxing pre-bed routine, and building healthy habits during the day can all contribute to ideal sleep hygiene. Sleepers can tailor their sleep hygiene practices to suit their needs; they can harness positive habits to make it easier to sleep soundly throughout the night and wake up well-rested (Suni, 2020).

Obtaining healthy sleep is important for both physical and mental health, improving productivity and overall quality of life, especially, among girls with primary Dysmenorrhea. Sleep hygiene encompasses both building an environment and set of habits or routines. It can also pave the way for higher-

quality sleep and better overall health. Creating a pleasant bedroom environment can be an invitation to relax and doze off. At the same time, optimizing sleep schedule, pre-bed routine, and daily routines is part of harnessing habits to make quality sleep feel more automatic (Suni, 2020).

Sleep hygiene practices that promote a better night's sleep include maintaining a regular sleep schedule, avoiding napping in the late afternoon, creating a bedtime routine, avoiding phones, tablets, and TV immediately before bed as well as finding the right temperature, lowering the light, avoiding late-night exercise, big meals and beverages late in the evening. They also involve reducing caffeine, nicotine and alcohol consumption and avoiding medicines that delay or disrupt sleep (Medic Alert, 2021).

Significance of the study:

University students are one of the high risk groups for developing sleep disorders, with a high vulnerability especially in nursing students. The prevalence of sleep disturbances has been reported high in nursing students, where it has been estimated about 20-60% percent among them (Yazdi et al, 2016). Unfortunately, sleep disturbance is one of the negative consequences of Dysmenorrhea, therefore practicing good sleep hygiene can only help with relaxation and getting a good night's sleep (Unver et al, 2021).

Aim of the study:

This study aimed to explore the effect of receiving sessions about sleep hygiene practices on quality of sleep pattern, insomnia and academic achievement among nursing students with primary Dysmenorrhea.

Study hypothesis:

H [1]: Nursing students who receive sessions about sleep hygiene experience good quality of sleep pattern than those who don't receive them.

H [2]: Nursing students who receive sessions about sleep hygiene experience less insomnia than those who don't receive them.

H [3]: Nursing students who receive sessions about sleep hygiene experience better academic achievement than those who don't receive them.

H [4]: Nursing students who receive sessions about sleep hygiene experience better sleep hygiene practices than those who don't receive them.

Operational definitions:

Sleep hygiene refers to a set of behavioral and environmental recommendations intended to promote healthy sleep.

Academic achievement represents performance outcomes that indicate the extent to which a student has accomplished specific educational goals.

Insomnia means difficulty to initiate or maintain sleep.

Subjects and method:

Research Design: Quasi-experimental research design

Study Setting:

This study was conducted at Faculty of Nursing, Mansoura University, Dakahlia Governorate, Egypt.

Study Subjects:

A purposive sample of 106 female nursing students was selected from the previously mentioned setting. They were divided by simple random technique into two groups; study (53) and control (53).

Inclusion criteria: with primary Dysmenorrhea, not pregnant and accept to participate in the study.

Tools of data collection:

Six tools were used by the researchers to collect the necessary data.

Tool one: basic data structured interview schedule, which was developed by the researchers and entailed three parts:

Part I: Socio- demographic characteristics such as age, marital status, and residence.

Part II: Menstrual history like duration and regularity of menstruation.

Part III: Academic achievement, which comprised pre & post intervention results of clinical rotation exam.

Tool two: ***Pittsburg Sleep Quality Index (PSQI),*** which was developed by buysse et al (1989). It is a self-rated questionnaire which was adopted by the researchers to assess sleep quality and disturbances over a 1-month time interval. Pittsburg Sleep Quality Index has seven components; subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. Each component is weighted on a 0–3 interval scale and the sum of seven components' scores yields one overall score ranging from 0 to 21, where a score of 5 or more indicates poor sleep quality[8].

Tool three: ***Insomnia Severity Index,*** which was developed by Blais et al (1997) and adopted by the researchers. It is a 5-point Likert scale (from 0-4) that is used to rate seven questions. The seven answers are added up to get a total score, which is interpreted as follows: absence of insomnia (0–7); mild insomnia (8–14); moderate insomnia (15–21); and severe insomnia (22–28) [9].

Tool four: ***Scale of Positive and Negative Experience (SPANE),*** which was developed by Diener et al (2009) and adoptedto assess subjective feelings of well-being and ill-being during the past four weeks.The SPANE is a 12-item questionnaire includes six items to assess positive feelings (positive, good, pleasant, happy, joyful, and contented) and six items to assess negative feelings (negative, bad, unpleasant, sad, afraid, and angry). The response for each item of positive and negative feelings ranged from 1-5; 1(Very Rarely or Never), 2(Rarely), 3 (Sometimes), 4(Often), 5(Very Often or Always).Scoring can be done for positive and negative feelings separately by adding the scores 1-5 for the six items of each feeling. The total score varies from 6 (lowest possible feelings) to 30 (highest positive feelings). It can be also measured by deriving an overall affect balance score, where the negative feelings score is subtracted from the positive feelings score, and the resultant difference score can vary from -24 (unhappiest possible) to+24 (highest affect balance possible) or a respondent rarely or never experiences any of the negative feelings, and very often or always has all of the positive feelings. [10].

Tool five: ***Flourishing Scale*** was developed by Diener et al (2009) and adopted to assess a single psychological well-being**.** It is a brief 8-item summary measure of the respondent's self-perceived success in important areas such as relationships, self-esteem, purpose, and optimism. The response for each item is measured by using 1–7 scale; 1 (Strongly disagree), 2 (Disagree), 3 (Slightly disagree), 4 (Mixed or neither agree nor disagree), 5(Slightly agree), 6 (Agree), 7 (Strongly agree). The total score ranged from 8 (lowest psychological well-being possible) to 56 (highest psychological well-being possible) or represents a person with many psychological resources and strengths. [10].

Tool six: ***Sleep hygiene practices questionnaire,*** which was developed by the researchers and has 8 practice items; using relaxation technique; being mindfulness; modifying environment; sleeping at regular time; having positive thinking; avoiding heavy meal and caffeine; as well as taking warm fluids and avoiding watching exciting movies. The response for each item is measured as follows: 3 (done), 2 (sometimes done), and 1(not done). The total score ranged from 8-24 and classified as follows: good practice (18-24), Fair practice (13-<18) and poor practice (8-<13).

Field Work:

First phase (Initial preparatory phase):

- Permission was obtained from the Head of Woman's Health and Midwifery Nursing Department at Faculty of Nursing, Mansoura University to collect data after explaining the purpose of the study.
- The plan of the study and the content of sleep hygiene strategy were prepared.
- Tools one & six were developed by the researchers after extensive review of recent and relevant literature, while tools two- five were adapted.
- Tools were reviewed for content validity by a jury of 3 expert professors in Maternity Nursing field.
- Tools were checked for their reliability by Cronbach's alpha test and the result

was reliable for tool two (0.80), tool three (0.74), tool four (0.75) & tool five (0.70).

- A pilot study was carried out on 10 nursing students (excluded from the study sample) to test the feasibility of the study. The purposes of the pilot study were to ascertain relevance, clarity and the applicability of the tools as well as to detect any problem peculiar to the statements as sequence and clarity that might interfere with the process of data collection. After conducting the pilot study, it was found that the sentences of the tools were clear and relevant; however, few words had been modified. Following this pilot study, the tools were revised, reconstructed and made ready for use.

Second phase (Implementation phase):

- Data were collected over a period of 3 months, starting from the beginning of March 2021till the end of May 2021.
- Data was collected from 3rd year nursing students with primary Dysmenorrhea while attending midwifery course.
- Data were collected through an interview schedule which was conducted individually.
- The study group received two interactive sessions; the first session was about menstruation and its impact as well as sleep hygiene practice strategy and factors affecting quality of sleep. The second session was training and demonstrating how to apply sleep hygiene practice strategy, especially during stressful situation.

Third phase (Evaluation phase):

After completion of data collection, comparison between the two groups was done to identify the effect of sleep hygiene practices on quality of sleep pattern, insomnia and academic achievement.

Statistical analysis was done by the researchers as follows:

- The collected data were categorized, coded, computerized, tabulated and analyzed using Statistical Package for Social Sciences (SPSS) version 23 program.
- Statistical measures were used such as cross tabulation to describe and summarize categorical variables of the two groups.
- A descriptive and analytical statistics were used such as percentages, mean & SD; whereas Chi-square-test, Fisher Exact-test and t-test were used to find out the difference in the results at 0.05 (5%) level of significance.

Ethical Considerations:

- An ethical approval was obtained from head of woman's health and midwifery nursing department.
- An informed consent was obtained from each participant after explaining the aim of the study.
- Participants' data was coded and properly maintained to ensure their confidentiality.
- The participants were informed about their right to withdraw at any time or refuse to participate in the study.

Results:

Table (I) displays distribution of nursing students according to their socio-demographic characteristics and menstrual history. ***Mean age*** was 21.45 ± 0.539 years for the study group and 21.30 ± 0.503 years for control group. ***Residence*** also clarified that a sizeable proportion of the study and the control groups (77.4% &71.7%) respectively were urban residents. In addition, ***marital status*** showed that the vast majority the study and the control groups (90.6% &83.1%) respectively were single. Moreover, ***mean duration of menstruation*** was 4.28±1.166 days & 4.51± 1.103 days for the former and the latter group respectively. Furthermore, ***regular menstruation*** was reported by the majority of study and control groups (84.9% & 83.1%) respectively. However, the two groups' socio-demographic characteristics and menstrual history were almost similar, where no statistically significant differences were found between them.

Table (II) illustrates the mean distribution of nursing students according to their sleep quality and disturbances using PSQI.

No statistically significant difference was found between the two groups before intervention. However, a highly statistically significant difference (P=<0.0001) was observed between the two groups after intervention, where the mean sleep quality and disturbances was5.019 ± 0.500for the study group, compared to13.811 ± 2.410for the control one.

Table (III) displays the number and percent distribution of nursing students according to their insomnia severity index. The relationship between the two groups was not statistically significant before intervention. Whereas it was highly statistically significant (P=0.000) between them after intervention, where mild insomnia was found among 69.8% of the study group, compared to 37.7% of the control group. On the contrary, moderate insomnia was found among 20.8% of the former group, compared to 50.9% of the latter group.

Table (IV) elucidates the mean distribution of nursing students according to their subjective feelings of well-being and ill-being using SPANE. No statistically significant difference was detected between the two groups' positive and negative experiences before intervention. But, a highly statistically significant difference (P=<0.0001) was noted between the two groups' positive experience after intervention, where the mean positive experience was 25.60 ± 2.706 for the study group, compared to 20.60 ± 0.906 for the control group. A statistically significant difference (P=0.010) was also recognized between the two groups' negative experience after intervention, where the mean negative experiences was13.55 ± 3.598 for the former group, compared to 15.53 ± 4.149 for the latter group.

Table (V) demonstrates the mean distribution of nursing students according to their psychological well-being using Flourishing Scale. The relationship between the two groups was not statistically significant before intervention. Yet, it was highly statistically significant (P=<0.0001) between them after intervention, where the mean psychological well-being was45.83 ± 5.536 for the study group, compared to36.75 ± 6.776 for the control group.

Table (VI) manifests the mean distribution of nursing students according to their academic achievement. No statistically significant difference was found between the two groups before intervention. Nevertheless, a highly statistically significant difference (P=<0.0001) was realized between them after intervention, where the mean academic achievement was18.11± 1.684 for the study group, compared to 13.13 ± 1.942 for the control group.

Table (VIII) explains the number, percent and mean distribution of nursing students according to their total score of sleep hygiene practices after intervention. The relationship between the two groups was highly statistically significant (P for χ^2 Test = 0.000) & (P for t-test = <0.0001), where good total score was obtained by the vast majority of the study group (86.8%), compared to a minority of the control group (5.7%). On the other hand, fair and poor total score was attained by 50.9% & 43.4% respectively of the latter group, compared to 13.2% & 0% respectively of the former group. The mean total score was 20.40 ± 1.864 for the study group, compared to 13.40 ± 2.537 for the control one.

Table (I): Distribution of nursing students according to their socio - demographic characteristics and menstrual history

Socio - demographic characteristics and menstrual history	Study group (n=53)		Control group (n=53)		t-test (P) F / χ^2 (P)
	No	%	No	%	
Mean Age (years):	21.45 ± 0.539		21.30 ± 0.503		1.481(0. 0.142)
Residence					
- Rural	12	22.6	15	28.3	0.447 (0.504)
- Urban	41	77.4	38	71.7	
Marital status:					
- Married	5	09.4	9	16.9	1.317 (0.251)
- Single	48	90.6	44	83.1	
Mean duration of menstruation (days)	4.28 ± 1.166		4.51 ± 1.103		1.043(0.299)
Regularity of menstruation:					
- Regular	45	84.9	44	83.1	0.07(0.791)
- Irregular	8	15.1	9	16.9	

χ^2 (P): Chi-Square Test &P for χ^2 Test
F (P): Fisher Exact test &P for F Test
*: Significant at P ≤0.05

Table (II): Mean distribution of nursing students according to their sleep quality and disturbances using PSQI

Sleep quality and disturbances	Study group (n=53)	Control group (n=53)	t-test (P)
	M & SD	M & SD	
Before intervention	13.151 ± 3.053	13.208 ± 2.865	0.099 (0.921)
After intervention	5.019 ± 0.500	13.811 ± 2.410	26.005 (<0.0001)**

*: Significant at P ≤0.05
**: Highly Significant at P ≤0.05

Table (III): Number and percent distribution of nursing students according to their insomnia severity index

Insomnia Severity Index	Study group (n=53)				Control group (n=53)				F / χ^2 (P)
	Before intervention		After intervention		Before intervention		After intervention		
	No	%	No	%	No	%	No	%	
No insomnia (0–7)	0	00.0	4	07.5	0	00.0	0	00.0	
Mild (8-14)	9	17.0	37	69.8	5	09.4	20	37.7	Before: 3.929 (0.140)
Moderate (15–21)	21	39.6	11	20.8	15	28.3	27	50.9	After :19.378 (0.000)**
Severe (22-28)	23	43.4	1	01.9	33	62.3	6	11.3	

χ^2 (P): Chi-Square Test &P for χ^2 Test
F (P): Fisher Exact test &P for F Test
*: Significant at P ≤0.05
**: Highly Significant at P ≤0.05

Table (IV): Mean distribution of nursing students according to their subjective feelings of well-being and ill-being using SPANE

SPANE	Study group (n=53)		Control group (n=53)		t-test (P)
	Before intervention	After intervention	Before intervention	After intervention	
	M & SD	M & SD	M & SD	M & SD	
Positive experience	17.49 ± 3.544	25.60 ± 2.706	16.98 ± 3.703	20.60 ± 0.906	Before: 0.7244 (0.471) After : 12.756(<0.0001)**
Negative experience	19.83 ± 4.219	13.55 ± 3.598	20.89 ± 2.391	15.53 ± 4.149	Before: 1.591 (0.115) After : 2.625 (0.010)*

*: Significant at P ≤0.05
**: Highly Significant at P ≤0.05

Table (V): Mean distribution of nursing students according to their psychological well-being usingFlourishing Scale

Psychological well-being	Study group (n=53)	Control group (n=53)	t-test (P)
	M & SD	M & SD	
Before intervention	28.26 ± 6.386	27.36 ± 6.978	0.693 (0.490)
After intervention	45.83 ± 5.536	36.75 ± 6.776	7.555(<0.0001)**

*: Significant at P ≤0.05
**: Highly Significant at P ≤0.05

Table (VI): Mean distribution of participants according to their academic achievement

Academic achievement	Study group (n=53)	Control group (n=53)	t-test (P)
	M & SD	M & SD	
Before intervention	13.25 ± 1.890	13.32 ± 1.795	0.196 (0.845)
After intervention	18.11 ± 1.684	13.13 ± 1.942	14.105 (<0.0001)**

*: Significant at P ≤0.05
**: Highly Significant at P ≤0.05

Table (VII): Distribution of nursing students according to their total score of sleep hygiene practices after intervention

Total score of sleep hygiene practices	Study group (n=53)		Control group (n=53)		F / χ^2 (P)
	No	%	No	%	
Good(18-24)	46	86.8	3	05.7	72.499 (0.000)**
Fair (13-<18)	7	13.2	27	50.9	
Poor (8-<13)	0	00.0	23	43.4	
M & SD	20.40 ± 1.864		13.40 ± 2.537		t-test: 16.188 (P=<0.0001)**

χ^2 (P): Chi-Square Test & P for χ^2 Test
F (P): Fisher Exact test &P for F Test
*: Significant at P ≤0.05
**: Highly Significant at P ≤0.05

Discussion:

Dysmenorrhea affects negatively young people's daytime functionality and nighttime sleep quality, leading to interruption of daily living activities, decreased concentration, lower performance, increased mistakes, school absenteeism, psychological, and physiological changes, and immune system failure [(11)]. Due to the impact of sleep quality on students' health, and their academic achievements, determining the relation between Dysmenorrhea and sleep quality is thought to be important. However, previous evidence has been limited; therefore, this study was conducted to determine the effect of receiving sessions about sleep hygiene practices on quality of sleep pattern, insomnia and academic achievement among nursing students with primary Dysmenorrhea.

The results of present study revealed significantly better sleep quality among the study group than the control one after intervention (Table II). This may be due to the effect of the sessions given to the study group about sleep hygiene practice. This finding corresponds with a study conducted in Turkey, where it was concluded that Dysmenorrhea is an important health problem in young women because it affects their sleep quality negatively (Sahin et al, 2014). It also relatively agrees with a study performed in Turkey, where it was found that sleep quality was poorer among university students who suffered from Dysmenorrhea than among those who did not (Unver et al, 2021).

Severity of insomnia was also decreased among the study group than the control one after intervention in the current study (Table III). This may reflect the effect of intervention given to them. This conforms to a study achieved in Upper Egypt, where it was reported that insomnia is significantly associated with Dysmenorrhea, therefore health awareness programs about sleep hygiene practice improved girls' knowledge regarding Dysmenorrhea and focused on the adaptive techniques used by them to avoid its negative consequences (Arafa et al, 2020). It is also accords with a study carried out in Turkey, where it was emphasized that the severity of insomnia was increased as the severity of dysmenorrheal pain increased (Unver et al, 2021).

On investigating subjective feelings of well-being and ill-being using SPANE and psychological well-being using Flourishing Scale, the present study demonstrated significantly more positive experience and less negative experience as well as more psychological well-being among the study group than the control one after intervention (Tables IV& V). This may result from giving sessions about sleep hygiene practices to the study group. These sessions may help improve their practices, which in turn let them have more psychological well-being and positive experience.

The current finding is conformable with a doctorate theses executed in Iowa City, IA, USA, where it was found that sleep deprivation is negatively correlated with psychological well-being within a university student population (Richter, 2015). It also matches an online survey implemented in Germany, UK & Netherlands, where it was discovered that sleep disturbances were related to decreased levels of psychological well-being (Freitag et al, 2017). In addition, the present finding suits a survey accomplished in china, where it was reported that poor sleep quality is associated with high levels of negative psychological well-being (Zhai et al, 2018). Moreover, it is similar to a study fulfilled in China, where it was detected that both poor sleep quality and insufficient sleep were associated with depression in university students (Li et al, 2020). Furthermore, the current finding tallies with a study achieved in Singapore, where significant associations was found between the overall sleep quality and psychological well-being (Armand et al, 2021).

Academic achievement was found to be statistically higher among the study group than the control one after intervention in the present study (Table VI). This was expected since their quality of sleep was improved after receiving sessions about sleep hygiene practices. In the last decade, a number of studies on the interaction between subjective sleep and academic achievement of university students have emerged. A study done in Cambridge, USA clarified that both objective sleep quantity

and quality before a test, positively correlated with academic grades (Okano et al, 2019). A study carried out in Spain also reported a positive relationship between sleep quality and academic scores (Toscano-Hermoso et al, 2020). In addition, a study performed in Riyadh, Saudi Arabia revealed that all indicators of poor academic performance were predicted by moderate/severe pain of primary Dysmenorrhea, including absenteeism, reduced concentration, reduced physical activity, submitting incomplete homework, impaired relationships with friends, getting low exam grades, and falling asleep during lectures (Dahlawi et al, 2021).

On the contrary, there are nevertheless a few studies that reported no association between sleep and academic achievement. For example, an objective sleep study executed in Texas, USA reported no difference in project grades between students who averaged at least 8 hours of sleep for five nights, leading up to the projects due date and those who did not (King et al, 2018). A Cohort Russian panel study also reported that high academic performance to be associated with shorter sleep among young adults between 20 and 21 years of age including university students (Dokula & Smirov, 2020). In addition, a study implemented in Iran revealed no significant difference in sleep quality between students with high grades and those with low grades (Jalali et al 2020). The difference between the findings of the previous studies and the current one may be due to different research design and participants.

Finally, total score of sleep hygiene practices was significantly higher among the study group than the control one after intervention in the present study (Table VII). This may reflect the effect of sessions given to them as mentioned before. These sessions improved nursing students' knowledge on the importance of adopting healthy sleep hygiene practices for better sleep quality and enhanced academic performance. This finding is relatively in harmony with a study accomplished in Canada, where it was promising to find that most students reported meeting the basic needs of sleep hours and used some strategies to help their sleep (Qin & Brown, 2017). In contrast, it is incongruent with a study fulfilled in Louisiana, USA, where it was found that improving or increasing sleep hygiene knowledge is not an intervention that would be effective in improving sleep hygiene practices (Felix et al, 2017). The disparity between the finding of this study and the current one is attributed to different sample size and method of data collection.

Conclusion:

Based on the findings of the present study, it can be concluded that receiving sessions about sleep hygiene practices has a greater significant impact on experiencing good sleep quality, less insomnia, more positive feelings of well-being and less negative feelings of ill-being, more psychological wellbeing, better academic achievement, and better sleep hygiene practices among nursing students with primary Dysmenorrhea. So the study aim and hypothesis were achieved within the framework of the present study.

Recommendation:

Based on the findings of the present study, the following recommendations are suggested:

- The development of sleep hygiene education program as an intervention and prevention strategy is recommended because it is a low-cost, accessible and practical method, which can be implemented within a short period of time.
- Health awareness programs should be encouraged to improve girls' knowledge regarding Dysmenorrhea.
- Sleep hygiene practices should be used by students during any stressful situation.

Further Researches should be performed to:

- Focus on the adaptive techniques used by girls to avoid the negative consequences of primary Dysmenorrhea.
- Study the impact of sleep hygiene practice strategies on working, pregnant, infertile and postoperative women.

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Conflict of Interest Disclosure

Researchers declared that there is no conflict of interest in the research.

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