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RESEARCH ARTICLE / *ARAŞTIRMA MAKALESİ*

The Effect of Sleep Hygiene Education on Sleep Quality of Children with Intellectual Disabilities and Their Mothers According to The Health Promotion Model

Zihinsel Engelli Çocuk ve Annelerine Sağlığı Geliştirme Modeline Göre Verilen Uyku Hijyeni Eğitiminin Uyku Kalitesine Etkisi

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ABSTRACT

Objective: This study was conducted to investigate the effect of sleep hygiene education on sleep quality of children with intellectual disabilities and their mothers according to the health promotion model.
Materials and Methods: The study enrolled 80 children with intellectual disabilities ranging in age from 2 to 18 years and their mothers (intervention and control groups). The socio-demographic data form of the mother and child, Child Sleep Habits Questionnaire (CSHQ), Pittsburgh Sleep Quality Index (PSQI), and sleep sensor device were used for data collection. The SPSS 25.0 data analysis program was used in the statistical analysis of the data obtained in the study, and the chi-square test, t-test, Mann U Whitney test and Pearson correlation were used for data analysis.
Results: The children and mothers in the intervention and control groups were found to be homogeneous within their respective groups, and there was a statistically significant difference between the sleep data and the mean scores of children with intellectual disabilities in the intervention and control groups before and after sleep hygiene education ($p<0.05$). It was determined that there was a statistically significant difference between the sleep data and the mean scores of the mothers in the intervention group before and after the education ($p<0.05$).
Conclusion: Sleep hygiene education has been shown to enhance the development of regular sleep behaviours in children with intellectual disabilities and their mothers.

Keywords: child with intellectual disabilities, health promotion model, mother, sleep hygiene education

ÖZ

Amaç: Bu araştırma, sağlığı geliştirme modeline göre zihinsel engelli çocuklar ve annelerinin uyku hijyeni eğitiminin uyku kalitesine etkisini araştırmak amacıyla yapılmıştır.
Gereç ve Yöntem: Çalışmaya yaşları 2 ile 18 arasında olan zihinsel engelli 80 çocuk ve anneleri (deney ve kontrol grupları) dahil edilmiştir. Veri toplama aracı olarak anne ve çocuğun sosyo-demografik veri formu, Çocuk Uyku Alışkanlıkları Anketi (CSHQ), Pittsburg Uyku Kalitesi İndeksi (PSQI) ve uyku sensörü cihazı kullanılmıştır. Araştırmada elde edilen verilerin istatistiksel analizinde SPSS 25.0 veri analiz programı kullanılmıştır. Verilerin analizinde ki-kare testi, t-testi, Mann U Whitney testi ve Pearson korelasyonu kullanılmıştır.
Bulgular: Deney ve kontrol grubundaki çocuk ve annelerin kendi grupları içinde homojen olduğu, deney ve kontrol grubundaki zihinsel engelli çocukların uyku hijyeni eğitimi öncesi ve sonrası uyku verileri ile puan ortalamaları arasında istatistiksel olarak anlamlı bir fark olduğu görülmüştür ($p<0,05$). Deney grubundaki annelerin eğitim öncesi ve sonrası uyku verileri ile ortalama puanları arasında istatistiksel olarak anlamlı bir fark olduğu belirlenmiştir ($p<0,05$).
Sonuç: Uyku hijyeni eğitiminin zihinsel engelli çocuklarda ve annelerinde düzenli uyku davranışlarının gelişimini arttırdığı saptanmıştır.

Anahtar Kelimeler: zihinsel engelli çocuk, sağlığı geliştirme modeli, anne, uyku hijyeni eğitimi

*This study was conducted in the doctoral thesis (It is a quantitative work).

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INTRODUCTION

Children with intellectual disabilities are individuals who have deficiencies or limitations in social and daily life skills in terms of mental functions and need special education and supports (1). It has been stated that children with intellectual disabilities experience physical, psychological and social problems in addition to their own disabilities (2,3). The most common of these problems is sleep problems that occur as a result of disruption of sleep patterns that affect the quality of life of both the child and the family (4).

It has been determined that children with intellectual disabilities have sleep problems such as difficulty falling asleep, drowsiness, waking up frequently, having nightmares/ bad dreams, talking during sleep, teeth grinding, somnolence, snoring, temporary cessation of breathing during sleep apnea and involuntary awakening (4,5,6,7).

Sleep hygiene is a critical aspect of sleep health maintenance. Sleep hygiene is described as engaging in activities that promote sleep (maintaining regular sleep patterns) and abstaining from behaviors that disrupt sleep (watching movies, interesting conversations or consuming caffeine-containing products) (8). Therefore, it is essential for children with intellectual disabilities and their mothers to develop healthy sleep habits, routines, and behaviors (9). Providing sleep hygiene education to children and their parents who have such problems will improve their sleep quality (10).

Sleep hygiene education is a method for enhancing the quality of sleep (11). It is critical for preventing sleep problems and defects associated with sleep disorders (12). It has been established that research and programs focusing on sleep hygiene education are beneficial for treating sleep problems. Austin et al. (13) conducted a study in which six parents of children with developmental disabilities between the ages of 3-7 participated in sleep education. After 15 weeks of sleep education, it was discovered that children's sleep problems decreased. In another study conducted with parents of children with ASD (autism spectrum disorder) between the ages of 2-10 revealed that sleep education had a positive impact on sleep duration (14). The effectiveness of a sleep education program provided in a small group arrangement was examined in the study by Reed et al. (15). While the focus groups consisted of families of 3-5 individuals, the study enrolled a total of 20 families with ASD. The ages of the children ranged from 3 to 10. The research indicates that the sleep education program positively impacts children's sleep behaviors and daytime behavior and their families' stress levels.

Implementing health promotion practices for both children and mothers will help minimize the negative effects of sleep deprivation (5). Health promotion is a term that refers to the activities aimed at optimizing the health potential of individuals, families, society, community groups and enhancing the level of well-being, and also maximizing the individual's current health behavior (16). Nola J. Pender first developed the health promotion model was first in 1987 and was revised in 1996. The model's purpose is to describe the components of lifestyle-related health promotion behaviors, evaluate the factors that may influence an individual's experiences and perceptions of health behavior and aid health professionals in comprehending the determinants of healthy lifestyle behaviors (17). In addition, the model is capable of guiding health promotion practices (18). To minimize sleep problems, it is critical to provide sleep hygiene education to children with intellectual disabilities and their mothers according to a health promotion model.

This study was conducted to investigate the effect of sleep hygiene education on sleep quality of children with intellectual disabilities and their mothers according to the health promotion model.

MATERIALS AND METHODS

Design

This research is a quasi-inversion study with a pretest-post-test control group design.

Participants

Children with intellectual disabilities between the ages of 2-18 and their mothers who had sleep problems, were included in the study. It was calculated based on previous studies with the G. Power-3.1.9.2 program to determine the sample size (13,19,20). As a result of the analysis, the sample size of the intervention and control groups was calculated as 80, 40 in the intervention group and 40 in the control group, with a level of α= 0.05 and a theoretical power of 0.80, an effect size of 0.70. Children were randomly divided into 2 groups according to the calculated groups from the group they belonged to.

Inclusion and exclusion criteria for research

Sampling inclusion criteria mother's.

- Having a child with intellectual disability aged 2-18,
- Voluntary and willing to participate in the study
- Not using regular sleeping pills
- Mother's sleep routines irregularity *children.*
- 2-18 age group children with intellectual disability
- Consent from the family

Mother's sampling exclusion criteria

- Mother's refusal to voluntarily participate in the study.
- Mothers who use sleeping pills regularly
- Mothers with no sleep problems *children.*
- Children without intellectual disability
- Aged other than 2-18 years
- Without sleep problems.

Research questions

- Is there a relationship between the effect of sleep hygiene training given to mentally retarded children and their mothers according to the health promotion model on sleep quality?

Data collection

In data collection, Sociodemographic Data Form of mother and child, which includes questions about the sociodemographic characteristics of children with intellectual disabilities and their mothers, prepared by the researchers using the literature; Child Sleep Habits Questionnaire (CSHQ), Pittsburgh Sleep Quality Index (PSQI) and Sleep Sensor Device were used.

Sociodemographic data form for mother and child: It consists of 8 questions to determine the sociodemographic characteristics of mothers and children.

Child sleeping habits questionnaire (CSHQ): The Children's Sleep Habits Questionnaire (CSHQ) - Abbreviated Form, developed by Owens et al. in 2000 to investigate children's sleep habits and related problems, consists of 33 items in total (21). The Turkish validity and reliability study (22) of the scale was conducted by colleagues including bedtime resistance (1,3,4,5,6,8 items), delay in falling asleep (item 2), sleep duration (items 9,10,11).), sleep anxiety (items 5,7,8,21), night awakenings (items 16,24,25), para-somnias (12,13,14,15,17,22,23), sleep Eight subscales were defined, which can be listed as respiratory impairment (18,19,20 items), and waking up in the morning/daytime sleepiness (items 26,27,28,29,30,31,32,33). Internal consistency of the scale and subscales was calculated using the Cronbach's alpha coefficient. The Cronbach's alpha coefficient was found to be 0.78.

The Pittsburgh Sleep Quality Index (PSQI): PSQI was developed by Buysse et al. in 1989 and has been shown to have adequate internal consistency, Cronbach alpha = 0.80), test-retest reliability and validity (23). The validity and reliability study of PSQI (Pittsburgh *Sleep* Quality Index) in our country was performed by (24). In this study, the Cronbach's alpha value of the scale was found to be 0.79 (Cronbach's alpha = 0.79). PSQI is a self-report scale that assesses sleep quality and disturbance over a one-month period. In the scale consisting of 24 questions, 19 questions are answered by the person, while the last 5 questions are filled by the person's roommate or bed partner. With 19 questions answered by the individual, 7 sub-dimensions are evaluated, including subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping pills, and daytime dysfunction.

Sleep sensor device (Beurer): The sleep device (Beurer) was used to evaluate the pulse and breathing frequency, apnea status, sleep-wake process of the individual during sleep. Sleep Score recording. Here the application creates an index from the saved values (between 0 and 100). This index provides information on daily sleep quality. The higher the sleep score, the higher the sleep quality (25).

Intervention

Pre-test: In the pre-test of children with intellectual disabilities aged 2-18 and their mothers in the intervention and control groups, the data were obtained from the mothers by using the "Sociodemographic Data Form of the Mother and Child", the Child Sleep Habits Questionnaire (CSHQ), the Pittsburgh Sleep Quality Index (PSQI), and the Sleep Sensor Device. The data were collected through face-to-face interviews with mothers. As data collection tools, questionnaires and scales were applied to the mothers in the school environment in the form of 10 minutes, and the sleep sensor device was given to the mothers by teaching them to use the sleep sensor device for 1 week in such a way that they would put their children in their beds, at the time of going to bed in the evening and waking up in the morning.

Sleep hygiene education: In the first stage of the research, the content/module of sleep hygiene education to children with intellectual disabilities and their mothers according to the health promotion model was prepared according to the data obtained from in-depth data interviews. The content of the training was prepared by using the interviews with the mothers and the literature. The education was given to mothers (intervention groups, n=40) of children with intellectual disabilities ranging in age from 2 to 18 years. The researcher conducted the education for eight weeks, two hours each day and two days a week. Each session lasted approximately 60 minutes. The education was intended to be conducted in groups of five participants, but mothers were trained individually in the research due to the pandemic. The education process began with the establishment of regulations for the opening, introduction, and meeting (10 minutes). In addition, the presentation on sleep hygiene education for children with intellectual disabilities and their mothers (40 minutes) was given according to the health promotion model and included the distribution and explanation of written education material (general information about sleep, factors that hinder and facilitate sleep, and information to increase sleep hygiene) (10 minutes).

Post-test: In the post-tests, the Child Sleep Habits Questionnaire, the Pittsburgh Sleep Quality Index (PSQI), and the Sleep Sensor Device were re-administered to the children in the intervention and control groups. The data collection tools used before the training were applied to the mothers again in the form of questionnaires and scales after the training, in the form of 10 minutes in the school environment, and the sleep sensor device was given to the mothers to use the sleep sensor device for 1 week, in the form of putting them in their children's beds, for the timing of going to bed in the evening and waking up in the morning.

Variables of the study

Independent Variable: Mother's age, marital status, educational status, number of children, child's age, gender, diagnosis, mental disability, sleep hygiene education.

Dependent Variable: The Pittsburgh Sleep quality index mean score, child sleep habits questionnaire mean score (sleeping problem, sleep behavior, departure time, bedtime, wakefulness), sleep sensor device indicators (night sleep time, daytime sleep time, total sleep time, nighttime sleep time, morning wake-up time, number of sleep interruptions, time to fall asleep, time to wake up in the morning).

Ethics Committee Approval

Approval from Kıbrıs İlim University Ethics Committee (decision no: 09, Date: 26.12.2019) and the official permission of the schools where the research was conducted. Verbal and written consent was obtained from the mothers.

Statistical analysis

SPSS 25.0 data analysis software was used in the statistical analysis of the data obtained during the study. Parametric tests were used for statistical evaluations for data with normal distribution (t-test) and non-parametric tests (Mann Whitney U and Kruskal Wallis test, Wilcoxon test) were used when it was not suitable for normal distribution. Chi-square analysis was used to test the homogeneity between categorical variables. Pearson correlation was used to test the relationship between continuous variables.

RESULTS

Findings related to socio-demographic characteristics

Socio-demographic characteristics of the mothers are shown in Table 1. There was no statistically significant difference between sociodemographic characteristics (p>0.05), and the groups were homogeneous. Socio-demographic characteristics of Children are shown in Table 2. There was no statistically significant difference between the socio-demographic characteristics of the children (p>0.05), and the groups were homogenous.

Table 1: Distribution of mothers by sociodemographic characteristics

		Experiment		Control		
		n	%	n	%	p
Age	20-24	4	10.0	3	7.5	1.494 0.738
	25-29	6	15.0	7	17.5	
	30-34	8	20.0	12	30.0	
	35 and over	22	55.0	18	45.0	
Marital status	Maried	33	82.5	36	90.0	0.949 0.518
	Single	7	17.5	4	10.0	
Edcation status	No education	1	2.5	0	0.0	4.047 0.542
	Primary school	11	27.5	8	20.0	
	Middle school	8	20.0	10	25.0	
	High school	14	35.0	18	45.0	
	University	6	15.0	4	10	
Number of children	1	11	27.5	10	25.0	4.145 0.245
	2	20	50.0	19	47.5	
	3	6	15.0	11	27.5	
	4 and over	3	7.5	0	0.0	
Total		**40**	**100.0**	**40**	**100.0**	

*p<0.05

Table 2: Distribution of children according to their sociodemographic characteristics

		Experiment		Control		
		n	%	n	%	p
Age	2-6	9	22.5	7	17.5	0.587 0.941
	7-10	10	25.0	11	27.5	
	11-15	11	27.5	13	32.5	
	16-18	10	25.0	9	22.5	
Gender	Girl	24	60.0	20	50.0	0.808 0.500
	Boy	16	40.0	20	50.0	
Diagnosis	Autism	16	40.0	24	60.0	7.063 0.070
	Down syndrome	9	22.5	11	27.5	
	Asperger syndrome	1	2.5	0	0.0	
	Other	14	35.0	5	12.5	
Disability level	Very light	2	5.0	1	2.5	1.780 0.931
	Light	20	50.0	19	47.5	
	Middle	15	37.5	17	42.5	
	Severe	2	5.0	3	7.5	
	Very severe	1	2.5	0	0.0	
Total		**40**	**100.0**	**40**	**100.0**	

*p<0.05

Table 3: Comparison of PSQI score averages of mothers in the experimental and control groups

	Pre-Training					
Group	**Min**	**Max**	**$\bar{X}$**	**SS**	**Test Value**	**p**
Experiment	5.00	17.00	11.70	2.43	1.000**	0.321
Control	7.00	16.00	11.17	2.26		
	Post-Training					
	Min	**Max**	**$\bar{X}$**	**SS**	**Test Value**	**p**
Experiment	7.00	12.00	9.32	1.24	774.500***	0.801
Control	5.00	15.00	9.47	1.78		

*p<0.05, ** t test, ***Mann Whitney U test

Comparison of psqi score averages of mothers in the experimental and control groups

The data on the comparison of the mean PSQI scores of the mothers in the intervention group who received sleep hygiene education and the mothers in the control group are shown in Table 3. There was no statistically significant difference between the mean PSQI scores of the mothers in the intervention and control groups before education (p=0.321). And there was no statistically significant difference between the mean PSQI scores of mothers in the study and control groups (p=0.801).

Comparison of the sleep habits questionnaire mean scores of the children in the experimental and control groups

Table 4: Comparison of the sleep habits questionnaire mean scores of the children in the experimental and control groups

	Pre-Training						
	Group	**Min**	**Max**		**SS**	**Test Value**	**p**
Bedtime resistance	**Experiment**	7.00	15.00	10.82	2.29	-3.241**	**0.002***
	Control	10.00	14.00	12.10	0.95		
Delay in falling asleep	**Experiment**	1.00	3.00	1.95	0.78	-0.594**	0.556
	Control	2.00	3.00	2.02	0.15		
Sleep time	**Experiment**	3.00	9.00	6.17	1.17	-1.659**	0.101
	Control	4.00	8.00	6.55	0.81		
Sleep anxiety	**Experiment**	4.00	12.00	7.30	2.16	-1.535**	0.131
	Control	4.00	9.00	7.87	0.96		
Night awakenings	**Experiment**	3.00	9.00	5.17	1.75	-2.632**	**0.011***
	Control	3.00	7.00	6.02	1.04		
Parasomnias	**Experiment**	7.00	17.00	10.85	2.66	-6.571**	**0.000***
	Control	11.00	19.00	14.20	1.81		
Sleep disturbance	**Experiment**	3.00	9.00	4.70	1.78	-2.477**	**0.015***
	Control	3.00	9.00	5.65	1.64		
Daytime sleepiness	**Experiment**	6.00	20.00	12.97	3.73	-4.596**	**0.000***
	Control	12.00	18.00	15.80	1.09		
Total	**Experiment**	44.00	81.00	59.95	9.24	-6.288**	**0.000***
	Control	57.00	81.00	70.22	4.61		
	Post-Training						
	Group	**Min**	**Max**		**SS**	**Test Value**	**p**
Bedtime resistance	**Experiment**	6.00	10.00	7.40	1.29	-12.672**	**0.000***
	Control	6.00	14.00	11.42	1.53		
Delay in falling asleep	**Experiment**	1.00	2.00	1.30	0.46	-6.789**	**0.000***
	Control	1.00	3.00	1.95	0.38		
Sleep time	**Experiment**	3.00	6.00	3.87	0.93	-8.798**	**0.000***
	Control	3.00	8.00	5.60	0.81		
Sleep anxiety	**Experiment**	4.00	7.00	4.85	1.02	-13.842**	**0.000***
	Control	4.00	10.00	8.02	1.02		
Night awakenings	**Experiment**	3.00	5.00	3.50	0.67	-11.320**	**0.000***
	Control	3.00	7.00	5.80	1.09		
Parasomnias	**Experiment**	7.00	11.00	8.10	1.05	-17.462**	**0.000***
	Control	11.00	19.00	13.97	1.84		
Sleep disturbance	**Experiment**	3.00	6.00	3.67	0.82	297.500***	**0.000***
	Control	3.00	9.00	5.50	1.72		
Daytime sleepiness	**Experiment**	6.00	13.00	8.57	1.79	-18.311**	**0.000***
	Control	11.00	18.00	15.37	1.51		
Total	**Experiment**	33.00	50.00	41.27	3.43	1.000**	**0.000***
	Control	49.00	77.00	67.65	5.25		

*p<0.001, ** t test, ***Mann Whitney U test

The data regarding the comparison of the children's sleep habits questionnaire mean scores of children in the intervention and control groups are shown in Table 4. There was a statistically significant difference between the resistance to bedtime, waking at night, parasomnias, respiratory disturbances during sleep, and daytime drowsiness, and the total scores of the questionnaire compared to the groups before education ($p<0.01$). As a result, it negatively affects sleep quality. In addition, there was a statistically significant difference between the resistance to bedtime, waking at night, parasomnias, respiratory disturbances during sleep, and daytime drowsiness, and the total scores of the questionnaire compared to the groups after education ($p<0.01$). After the education, the study group has better scores (lower) more items than before treatment. This is an important result because it shows the effectiveness of the treatment.

Comparison of the sleep device data used by the children in the experimental and control groups before and after

The data on the comparison of the sleep tracker indicators of the children in the intervention and control groups before and after the education is shown in Table 5. Compared to the groups before the education, there was a statistically significant difference between the duration of daytime sleep, waking time

Table 5: Comparison of the sleep device data used by the children in the experimental and control groups before and after education

Pre-Training							
	Group	**Min**	**Max**		**SS**	**Test Value**	**p**
Sleep score	**Experiment**	20.00	89.00	65.12	16.61	697.500***	0.323
	Control	46.00	89.00	66.57	8.58		
Night sleep time	**Experiment**	2.00	8.00	4.70	1.36	-1.568**	0.121
	Control	2.00	8.00	5.25	1.75		
Daytime sleep time	**Experiment**	0.00	6.00	2.35	1.57	574.500***	**0.024***
	Control	0.00	3.00	1.55	0.90		
Total sleep time	**Experiment**	0.13	9.16	5.98	2.21	697.500***	0.324
	Control	3.21	8.54	6.16	1.15		
Night wake up time	**Experiment**	0.00	5.00	2.42	1.59	2.472**	**0.016***
	Control	1.00	4.00	1.70	0.93		
Morning wake up time	**Experiment**	0.30	10.08	6.38	2.43	731.000***	0.507
	Control	2.30	23.56	7.64	2.90		
Number of sleep splits	**Experiment**	0.00	5.00	3.00	1.24	298.000***	**0.000***
	Control	1.00	8.00	1.65	1.29		
Time to fall asleep	**Experiment**	2.00	25.00	8.97	5.80	746.000***	0.600
	Control	3.00	15.00	7.17	2.39		
Morning wake up time	**Experiment**	3.00	20.00	8.95	4.15	505.500***	**0.004***
	Control	1.00	10.00	6.42	2.28		
Post-Training							
	Group	**Min**	**Max**		**SS**	**Test Value**	**p**
Sleep score	**Experiment**	20.00	93.00	56.02	18.90	535.500***	**0.011***
	Control	47.00	84.00	66.72	10.22		
Night sleep time	**Experiment**	2.00	5.00	3.35	0.85	0.861**	0.392
	Control	1.20	6.50	3.17	1.00		
Daytime sleep time	**Experiment**	0.00	3.00	0.87	0.99	1.047**	0.298
	Control	0.00	3.00	0.65	0.86		
Total sleep time	**Experiment**	1.41	8.18	5.29	1.99	-3.305**	**0.001***
	Control	3.09	11.31	6.67	1.71		
Night wake up time	**Experiment**	0.30	23.46	3.07	3.41	753.000***	0.651
	Control	0.50	6.26	2.65	0.96		
Morning wake up time	**Experiment**	6.07	10.34	7.70	1.35	1.895**	0.062
	Control	3.58	10.50	7.14	1.30		
Number of sleep splits	**Experiment**	1.00	12.00	4.00	2.50	466.000***	**0.001***
	Control	0.00	4.00	2.22	1.07		
Time to fall asleep	**Experiment**	0.00	15.00	5.47	2.96	1.815**	0.073
	Control	0.00	10.00	4.27	2.95		
Morning wake up time	**Experiment**	1.00	10.00	4.30	2.58	-0.358**	0.721
	Control	0.00	12.00	4.52	3.02		

*p<0.05, ** t test, ***Mann Whitney U test

at night, the number of sleep interruptions, and the waking time in the morning (p<0.05). According to the scoring results, it was determined that sleep quality increased after sleep hygiene training.

Examination of the relationship between the sleep quality mean scores of mothers and children in the experimental group

The data on the examination of the relationship between the sleep quality mean scores of the mothers and children in the intervention group are shown in Table 6. There was a statistically significant difference between the sleep quality scores of the children (CSHQ) and mothers (PSQI) in the intervention group, and there was a strong positive correlation between the sleep quality scores after sleep hygiene education (p=.086, p=.072 p<0.05).

DISCUSSION

Table 6: Examination of the relationship between the sleep quality mean scores of mothers and children in the experimental group

	Child Sleeping Habit Questionnaire (CSHQ)	PSQI
Child Sleeping Habit Questionnaire	1.000	0.323
p	-	**0.042***
PSQI Scale		1.000
p		-
Sleep Hygiene Training		
p	**0.086***	**0.072***

*p<0.05 Pearson correlation

Age is a significant sociodemographic characteristic. In the study conducted (14) on the sleep of children with intellectual disabilities and mothers, 62% of the mothers were 30 years and older, 10% were 20-30 years old in the intervention group, and 21% of the mothers were 35 years and older, and 7% were 20-30 years old in the control group. The marital statuses of the mothers were discovered to be 82.5% married and 17.5% single in the intervention group, whereas 90% of the mothers were married and 10% were single in the control group. In a randomized parallel study evaluating the sleep problems of children with special needs, it was concluded that 81.4% of the mothers were married and 18.6% were single in the intervention group, whereas 72% of the mothers were married and 28% were single in the control group (26). In the data regarding the education status of the mothers, it was determined that 35% of the mothers were high school graduates, and 27.5% were primary school graduates in the intervention group, whereas 45% of the mothers were high school graduates and 25% were secondary school graduates in the control group.

In the study conducted on the sleep problems of preschool children with cerebral palsy and intellectual disability, it was stated that 65% of the children were 13 years old, 30% were 6 years old, and 5% were 1 year old (27). According to the gender data from the sociodemographic characteristics of the children, 60% of the children were girls, and 40% were boys in the intervention group included in our study, whereas 50% of the children were girls and 50% were boys in the control group. In the study conducted on children with intellectual disabilities studying at a primary special education school in Izmir and their families, 42.4% of the children were girls, and 57.6% were boys (28). According to the diagnosis status of the children included in the study, 40% of the children had ASD, and 2.5% had Asperger's syndrome in the intervention group, whereas the children in the control group had 60% ASD and 12.5% had other intellectual disabilities. When data on disability levels from the sociodemographic characteristics of the children with intellectual disabilities included in the study were analyzed, it was revealed that 50% of the children had mild, and 2.5% had very severe disability levels in the intervention group. In comparison, 47.5% of the control group had mild, and 2.5% had a very mild disability level.

Children with intellectual disabilities between the ages of 2-10 and their mothers were included in the study. Children's sleep was monitored with a child sleep habits questionnaire, sleep diaries, and actigraphy (14). Parents were provided with individualized sleep hygiene education for their children for 1 month. It was concluded that the children's sleep problems decreased after the education. In another study, children with intellectual disabilities between the ages of 5-15 and their mothers participated. They have stated that they experience sleep problems such as bedtime resistance, waking up at night, and spontaneous awakening at night. In addition, the child sleep habits questionnaire and the parent efficacy scale were used for evaluating the sleep quality of children and parents. The factors that prevent sleep were determined, and a 3-month sleep hygiene education was provided to the intervention group in a behavioral sleep program regarding these factors. After the education, measurements regarding the sleep of children were repeated, and the result indicated that the intervention group had greater sleep quality than the control group, which is consistent with the findings of the study (29). According to the results of the child sleep habits questionnaire and actigraphy after the education on sleep hygiene, it was established that the children's sleep problems decreased.

The findings indicated that there were differences in the mean sleep quality scores of mothers and children in the intervention group before and after the sleep hygiene education given in line with the health promotion model. Behavioral treatment for sleep problems in children with severe intellectual disability had similar results with the study regarding the treatment's effect on mothers and fathers (30). Discovered that children with ASD and learning difficulties and their mothers had sleep problems such as resistance to sleep and waking up at night (31). Children's sleep was recorded using a child sleep habits questionnaire, and mothers were handed a picture booklet. It was determined that they followed the instructions in the

sleep booklets and the methods for resolving sleep problems, and that sleep problems in children and mothers decreased, and there was a relationship between the mean sleep quality scores. Study on the sleep problems of children and families with ASD (32), according to the feedback received from the parents after the education, it was stated that there were positive effects on sleep levels by 32%, the sleep quality of children increased, and accordingly, there was a relationship between the average sleep quality scores of mothers.

Limitations of the study

The results of the research can be generalized to the children with intellectual disabilities in the age group of 2-18 and their mothers who have participated in the study.

CONCLUSION

Sleep hygiene education has been shown to aid in the development of regular sleep behaviors in children with intellectual disabilities and their mothers. Based on Pender's Health Promotion Model, a nurse education concept was created to improve sleep patterns through sleep hygiene education. In conclusion, the health promotion model developed to improve sleep patterns was found to be a viable guide for enhancing the sleep patterns and habits of children with intellectual disabilities and their mothers. In addition, it is recommended to evaluate the sleep quality of children with intellectual disabilities and their mothers on a regular basis, to provide education on sleep hygiene (physiological, psychological, and environmental factors), and to conduct studies examining the effectiveness of education and counseling programs applied by pediatric nurses to children with intellectual disabilities and their mothers in improving sleep quality.

Ethics Committee Approval: This study was approved by the ethics committee of Cyprus Science University Ethics Committee (decision no: 09, Date: 26.12.2019).

Informed Consent: Written consent was obtained from the participants.

Peer Review: Externally peer-reviewed.

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REFERENCES

1. Avşaroğlu, S., Okutan, H. Investigation of life satisfaction, optimism and psychological symptom levels of families children with intellectuel disabilities. Manas Journal of Social Research. 2018; 7(1) :59-76.
2. Caliskan, Z. & Bayat, M. The effect of education and group interaction on the family burden and support in the mothers of intellectually disabled children. Anatolian Journal of Psychiatry.2016; 17: 214–222.
3. Devnani, PA. & Hedge, AU. Autism and sleep disorders. Journal of Pediatric Neurosciences. 2018; 10(4): 304-307.
4. Richdale AA. Descriptive analysis of sleep behavior in children with fragile X". Journal of Intellectual & Developmental Disability. 2003; 28: 135-144.
5 Angriman, M., Caravale, B., Novelli, L., Ferri, R., Bruni, O. Sleep in children with neurodevelopmental disabilities. 2015; Neuropediatrics, 46(03): 199-210.
6. Jin, C. S., Hanley, G. P., & Beaulieu, L. An individualized and comprehensive approach to treating sleep problems in young children. Journal of Applied Behavior Analysis. 2013; 46(1): 161-180.
7. Liu, JP., Li, AC., Xu, KH., Velozzi, DM., Yang, ZS., Milliman, JD., & DeMaster, DJ. Sedimentary features of the Yangtze River-derived along-shelf clinoform deposit in the East China Sea. Continental Shelf Research. 2006; 26(17-18):2141-2156.
8. Odabaşıoğlu, ME., Dedeoğlu, T., Kasirga, Z., Sünbül, F. Üniversite öğrencilerinde uyku hijyeni. Gümüşhane Üniversitesi Sağlık Bilimleri Dergisi. 2017; 6(4): 204-212.
9. Lukowski, AF. ve Milojevich HM. Sleep problems and temperament in young children with down syndrome and typically developing controls. Journal of Intellectual Disability Research. 2017; 61(3): 222.
10. Jan, JE., Owens, JA., Weiss, MD., Johnson, KP., Ipsiroglu, OS. Sleep hygiene in children with neurodevelopmental disabilities. Pediatrics. 2008; 122: 1343–1350.
11. Geiger-Brown, JM., Rogers, VE., Liu, W., Ludeman, EM., Downton, KD., Diaz-Abad, M. Cognitive-behavioral therapy in persons with comorbid insomnia: a meta-analysis. Sleep Med Rev. 2015; 23: 54-67.
12. Güneş, Z. Uyku Sağlığının Korunmasında Uyku Hijyenin Rolü ve Stratejileri. Arşiv Kaynak Tarama Dergisi. 2018; 27(2): 188-198.
13. Austin, KL., Gordon, JE., O'Connell, M. Preliminary evaluation of a sleep-wise program for children with sleep disturbance and developmental disabilities. Child and Family Behavior Therapy. 2013; 35(3): 195-211.

14. Malow, BA., Adkins, KW., Reynolds, A., Weiss, SK., Loh, A., Fawkes, D., Clemons, T. Parent-based sleep education for children with autism spectrum disorders. Journal of Autism and Developmental Disorders. 2014; 44: 216–228.
15. Reed, HE., McGrew, SG., Artibee, K., Surdkya, K., Goldman, SE., Frank, K. Parent based sleep education workshops in Autism. Journal of Child Neurology; 2009; 24(8): 936-945.
16. Edelman, CL., Mandle, CL., Kudzma, EC. Health promotion throughout the life span-e-book. Elsevier Health Sciences. 2017.
17. Bahar, Z., Açıl, D. Sağlığı geliştirme modeli: kavramsal yapı. Dokuz Eylül Üniversitesi Hemşirelik Yüksekokulu Dergisi. 2014; 7(1): 59-67.
18. Çalık, A. ve Kapucu, S. Diyabetli hastalarda sağlıklı yaşam biçimi davranışlarını geliştirme: Pender'in sağlığı geliştirme modeli (Developing healthy life style behaviors in diabetic patients: Pender's health promotion model). Hacettepe Üniversitesi Hemşirelik Fakültesi Dergisi. 2017; 4(2): 62-75.
19. Malow, BA., Adkins, KW., Reynolds, A., Weiss, S. K., Loh, A., Fawkes, D., Clemons, T. Parent-based sleep education for children with autism spectrum disorders. Journal of autism and developmental disorders. 2014; 44; 216-228.
20. Weiskop, S., Richdale, A., Matthews, J. Behavioral treatment to reduce sleep problems in children with autism and fragile x syndrome. Developmental Medicine & Child Neurology. 2005; 47(2): 94-104.
21. Owens, JA ve Witmans, M. Sleep problems. Curr Probl Pediatr Adolesc Health Care. 2004; 34: 154-179.
22. Perdahlı Fiş, NP., Arman, A., Ay, P., Topuzoğlu, A., Güler, AS., Gökçe İmren, S., Berkem, M. Çocuk uyku alışkanlıkları anketinin Türkçe geçerliliği ve güvenilirliği. Anadolu Psikiyatri Dergisi. 2010; 11(2):151-60.
23. Buysse, DJ., Reynolds, CF., Monk, TH., Berman SR., Kupfer DJ. (1989). The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry research. 1989; 28(2): 193-213.
24. Ağargün, MY., Kara H., Anlar, O. Pittsburgh uyku kalitesi indeksinin geçerliği ve güvenirliği. Türk Psikiyatri Dergisi. 1996; 7: 107-115.
25. Beurer SE 80 Sleep Expert User Manual. 42; 2020.
26. Mehri, M., Chehrzad, MM., Mardani, A., Maleki, M., Dianatinasab, M., Kousha, M., Assari, S. The effect of behavioral parent education on sleep problems of school-age children with ADHD: A parallel randomized controlled trial. Archives of Psychiatric Nursing. 2020; 34(4): 261-267.
27. Kelmanson, IA. Sleep disturbances and behavioral and emotional problems in preschool children with bilateral cerebral palsy. Somnology. 2018; 22(1): 18-26.
28. Sarı, H. Sleep problems in children with intellectual disability. New Medical Journal. 2010; 27:151-155.
29. Stuttard, L., Beresford, B., Clarke, S., Beecham, J., Curtis, J. A preliminary investigation into the effectiveness of a group-delivered sleep management intervention for parents of children with intellectual disabilities. Journal of Intellectual Disabilities. 2015; 19(4) 342-355.
30. Wiggs L., Stores G. Behavioural treatment for sleep problems in children with severe intellectual disabilities and daytime challenging behaviour: Effect on mothers and fathers. Br J Health Psychol. 2001; 6: 257–269.
31. Montgomery, P., Stores, G., Wiggs, L. The relative efficacy of two brief treatments for sleep problems in young learning disabled (mentally retarded) children: A randomized controlled trial. Archives of Disease in Childhood. 2004; 89(2): 125-130.
32. Pertiwi, S. M. H., Irwanto, I. The Quality of Life of Mothers Who Have Children with Autism Spectrum Disorder. IJDS: Indonesıan Journal Of Dısabılıty Studıes. 2020; 7(2): 141-150