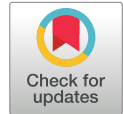**İSTANBUL UNIVERSITY PRESS**

CURARE
Journal of Nursing

Research Article

🔓 **Open Access**

Investigation of Sleep Hygiene and Quality of Life in Nursing Students

Betül Bayrak [1] 📧 & Beyza Alev [2]

[1] Ordu University, Faculty of Health Sciences, Department of Nursing, Ordu, Türkiye
[2] Ordu University, Institute of Health Sciences, Department of Nursing, Ordu, Türkiye

Abstract

Objective: To determine the level of sleep hygiene and quality of life in nursing students and to investigate the relationship between them.

Material and Methods: The descriptive and correlational type research was conducted between June 1 and July 1, 2023 with 324 students (N=475) from all classes of the nursing department of a university who agreed to participate in the research without any sample selection. Data were collected with the "Personal Information Form", "Sleep Hygiene Index (SHI)" and "SF-36 Quality of Life Scale". Data analysis was performed on the computer with the SPSS-26 statistical package program.

Results: The mean age of the students was 20.5 ± 1.7, 76.2% were female, 28.7% were first year students. The students' SHI score average was 33.6 ± 6.2, and the SF36 scale sub-dimensions score were; physical function 91.5±12.5, physical role difficulty 67.7±34.9, emotional role difficulty 50.1±42.2, vitality 47.1±17.0, social function 74.8±18.5, pain 64.1±21.6, mental health 57.5±16.7 and general health perception 57.2±16.2. It was found that a statistically significant difference between students' grade level, financial situation, general sleep patterns, general health status, general quality of life and SHI score averages (p<0.01). Between the students' SHI scores and the SF36 scale, all sub-dimensions except physical function were obtained a negative moderately significant relationship (p<0.01).

Conclusion: In the study, it was concluded that the sleep hygiene of the nursing students was at a moderate level, in the quality of life sub-dimensions physical function was the highest and vitality was the lowest, and a negative relationship between the quality of life sub-dimensions except for physical function, and sleep hygiene.

INTRODUCTION

Sleep, which accounts for about one-third of our lives, is a physiological process in which the interaction between the body and environment is interrupted for a certain period of time, its depth varies, and it can be reversed with stimuli (1). Sleep is a need just like eating and breathing. It affects conditions such as physical performance, metabolic order, memory, and perception (2). Sleep hygiene is about adopting good sleep habits and avoiding bad ones (3). The interventions that improve sleep quality can be counted as healthy and balanced eating habits, regular sleep habits, regular physical activity, peaceful family life, and good psychological health. In addition to these, habits that negatively affect sleep quality include the use of alcohol and tobacco products, consumption of products containing caffeine at late hours, and spending time with tools such as telephones (4). Adopting sleep-facilitating behaviours and postponing sleep-disturbing behaviours can improve sleep quality and thus quality of life (5). Life quality, a multidimensional concept, a factor affecting is sleep quality (6). The World Health Organisation defines 'Quality of Life' as 'how people perceive their situation within the whole of the culture and value judgements in which they live in relation to their goals, expectations, standards and interests' (4). Ensuring sleep hygiene is one of the healthy lifestyle behaviours that improve quality of life (7). It is widely believed that university students do not get enough sleep and their sleep quality is inefficient (7). Students who do not get enough sleep are probably negatively affected cognitively, physically and mentally. In addition, lack of sleep negatively affect academic success in students (8). Nursing students face challenges such as high academic demands with intensive coursework and excessive practice responsibilities. Therefore, they generally tend to sleep for shorter periods of time on weekdays and sleep longer on weekends, which may lead to health problems. These problems may negatively affect the quality of life (9). Nursing students are expected to use healthy lifestyle behaviours such as sleep hygiene to protect and improve their health since their academic education (10). The reason for this is that nursing students who provide health services should be careful and have an open mind because they come together with patients in practice, and it is extremely important that they themselves can lead a healthy life when they step into the profession (11).

In the literature, there are many studies in which sleep hygiene and quality of life were examined together and separately. Sleep hygiene and quality of life have been investigated in chronic patients such as COPD and haemodialysis patients (12, 13), and its effect on sleep

disorders and quality of life in shift workers has been investigated (14). In addition, studies have examined the effect of sleep hygiene on the quality of life in young individuals aged 14-18 years (4), and the relationship between sleep quality and quality of life and academic self-efficacy (6) and mental health (7) in university students. However, no study examining sleep hygiene and quality of life together in nursing students among these populations has been found. In this context; in nursing students, sleep hygiene habits and quality of life status were examined together in this study and it was aimed to contribute to the literature.

Aim of the Study

This study determined sleep hygiene and quality of life in nursing students and the relationship between them.

Research Questions;

1. What is the level of sleep hygiene of nursing students?
2. What is the level of quality of life of nursing students?
3. Is there a relationship between sleep hygiene and the quality of life of nursing students?

MATERIAL AND METHODS

Research Type

This research was conducted in the descriptive-correlational type.

Participation in the Study

The study population consisted of 475 nursing students studying in all grades at X University, Department of Nursing. Without any sample selection, it was completed with 324 nursing students who accepted in the study between 1 June and 1 July 2023. In the study, 68.2% of the population participated in the study.

Data Collection Tools

The data were collected with a questionnaire form including 'Personal Information Form', 'Sleep Hygiene Index' and 'SF-36 Quality of Life Scale'. **Personal Information Form:** The form included a total of 13 questions and was developed by the researchers in line with the literature (6). The questions about age, gender, marital status, educational grade, family type, financial status, class, current place of residence, place of living for the longest time, employment status, how the sleep pattern and health status is evaluated in general, and how the quality of life in general. **Sleep Hygiene Index (SHI):** The Index was developed by Mastin et al. in 2006 and

adapted into Turkish by Güzel Özdemir et al. in 2015. It was designed to determine and evaluate sleep behaviours that constitute sleep hygiene. The items in the SHI were derived from the diagnostic criteria for inadequate sleep hygiene in the International Classification of Sleep Disorders (15). This index, consisting of a total of 13 questions, is a five-point Likert-type ranging from Never to Always. The index ranges from a minimum of 13 to a maximum of 65 points. An increase in the score indicates a deterioration in sleep hygiene (16). In this study, the Cronbach's alpha value of the scale was calculated as 0.70. **SF-36 Quality of Life Scale:** The scale, which is used to assess satisfaction in each area of life related to health, was developed by Ware and Sherbourne in 1987 (17) and adapted into Turkish by Pınar in 1995 (18). It consists of 36 items, measuring 8 sub-dimensions (physical function, role difficulties to physical, role difficulties to emotional, mental health, social function, vitality, pain and general health perception). The scale provides an assessment of the health status over the last four weeks. The scale items can be evaluated on a three-point, five-point, and six-point Likert scale, and the fourth and fifth items are answered in a yes/no format. The total score of the scale is not calculated but evaluated on the basis of sub-dimensions. The sub-dimensions scores ranged from 0 to 100 (0 being the worst, 100 being the best). Using a positive scoring system in the scale, the higher the score of each health domain, the higher the health-related quality of life (18, 19). In this study, the Cronbach's alpha value was 0.87.

Data Collection

After obtaining the necessary institutional permission and ethics committee approval, the data of the study were conducted in all grades of nursing students at X University, Department of Nursing. After explaining the aim and scope of the study, the questionnaire form was used for the volunteer students who agreed to participate in the study. Due to the mixed education system at the time of the study, research data were collected using both face-to-face questionnaire forms and online Google Forms. Data collection took about 15 minutes.

Statistical Analysis

IBM SPSS 23.0 statistical package program (Armonk, NY), descriptive tests, Kolmogorov-Smirnov test, Kruskal-Wallis and Mann-Whitney U test, t test, one-way ANOVA, spearman correlation analysis, and Cronbach alpha reliability analysis were used in the analysis of the data. In the statistical analyses, the significance level was set as $p < 0.05$.

Ethical Consideration

First, permission for the use of the "Sleep Hygiene Index (SHI)" was obtained from the authors from e-mail. The "SF 36 Quality of Life Scale" used in the study is a scale that is approved for general use, provided that the source is cited and included in the references. Ethical approval (dated 26.05.2023 and decision no: 2023/151) was obtained from Ordu University Clinical Research Ethics Committee and institutional permission (dated 18.04.2023 and numbered E-70755926-900-0854593) from X University Faculty of Health Sciences to conduct the study in nursing students. At the time of data collection, students who volunteered to participate in the study gave written consent after receiving information. The consent form included explanations that participation in the study was voluntary and that there was no obligation/sanction, that the participant could withdraw from the study at any time, and that the answers to the survey questions would be kept confidential and would not be shared with anyone. This study adhered to the Helsinki Declaration of Human Rights and the principles of publication ethics.

RESULTS

The mean age of the nursing students in the study was 20.5 ± 1.7 years, 76.2% were female and 28.7% were first year students. 84.6% of the students had core families, 72.8% lived in state dormitories, and 70.7% stated that their income was equal to their expenses. 46.9% of the students evaluated their general sleep patterns as moderate, 47.5% evaluated their general health status as good, and 53.7% evaluated their general quality of life as moderate (Table 1).

Table 1. Data on the Demographic Characteristics of Nursing Students (N= 324)

Variables	n	%
Age	Mean ± SD (20.5 ± 1.7)	Min- max (18-30)
Gender		
Female	247	76.2
Male	77	23.8
Marital Status		
Married	-	-
Single	324	100
Grade Level		
Level 1	93	28.7
Level 2	81	25.0
Level 3	90	27.8
Level 4	60	18.5
Family Type		
Core family	274	84.6
Extended family	43	13.3

Variables	n	%
Fragmented family	7	2.2
Financial Status		
Income less than expenditure	49	15.1
Income equals expenditure	229	70.7
Income more than expenditure	46	14.2
Current place of residence/stay		
At home with family	46	14.2
At home with friends	24	7.4
State dormitory	236	72.8
Private dormitory	18	5.6
Diagnosed Chronic Disease		
No	290	89.5
Yes	34	10.5
Medication Use Continuously		
No	303	93.5
Yes	21	6.5
General Sleep Pattern		
Excellent	6	1.9
Good	84	25.9
Medium	152	46.9
Bad	67	20.7
Atrocious	15	4.6
General Health Status		
Excellent	12	3.7
Good	154	47.5
Medium	142	43.8
Bad	13	4.0
Atrocious	3	0.9
General Quality of Life		
Excellent	6	1.9
Good	112	34.6
Medium	174	53.7
Bad	27	8.3
Atrocious	5	1.5

Standard Deviation, Min: Minimum, Max: Maximum

It was found that the mean score of SHI was 33.6 ± 6.2 and sleep hygiene was at a moderate level of the nursing students. As seen in Table 2, the mean scores of the SF36 scale sub-dimensions (highest 91.54 ± 12.51 and lowest 47.11 ± 17.04) were in the medium-good level range, and it was observed that physical function was the highest and vitality the lowest mean score (Table 2). When analysed in the context of nursing students' SHI item mean scores, it was found that the highest item mean score was "I do something that increases my alertness before the time of bedtime, such as video games and internet use" with 3.48 ± 1.12 (Table 3). When the SHI and SF36 scale sub-dimensions were analysed according to the demographic characteristics of the nursing students, it was found that there was a statistically significant difference between grade level, financial status, general sleep patterns, general health status, general quality of life and SHI mean scores (p<0.01). It was observed that 1st year nursing students and those whose income was higher than their expenses had high SHI scores, and SHI scores increased as health status and quality of life worsened (p<0.01). It was found that there was a statistically significant difference between the mean scores of students' gender, chronic disease status, general sleep patterns, general health status, general quality of life and SF36 scale sub-dimensions (p<0.05). In the study, it was observed that the quality of life sub-dimension scores of female students and those with chronic diseases were lower, and the quality of life sub-dimensions increased significantly as sleep patterns and health status improved (p<0.05) (Table 4). A negative and moderately significant correlation was found between students' SHI scores and the SF36 scale for all sub-dimensions except physical functioning (p<0.01) (Table 5).

Table 2. Sleep Hygiene and Quality of Life Scale Scores of Nursing Students (N= 324)

Scales	Sub-Dimensions	Mean ± SD	Min - max	Cronbach alpha
Sleep Hygiene Index		33.69 ± 6.25	17-50	.70
SF 36 Quality of Life Scale				.87
SF 36 Quality of Life Scale	Physical Function (PF)	91.54 ± 12.51	10-100	
	Role Difficulties to Physical (RDP)	67.74 ± 34.93	0 –100	
	Pain	64.17 ± 21.66	10-100	
	General Health Perception (GHP)	57.27 ± 16.23	5-100	
	Vitality/Fatigue	47.11 ± 17.04	0- 100	
	Social Function (SF)	74.80 ± 18.51	12-100	
	Role Difficulties to Emotional (RDE)	50.10 ± 42.25	0-100	
	Mental Health (MH)	57.58 ± 16.70	8 –96	

SD: Standard Deviation, Min: Minimum, Max: Maximum

Table 3. Sleep Hygiene Index (SHI) Item Mean Scores of Nursing Students (N=324)

Sleep Hygiene Index Items	Mean ± SD
1. I take daytime naps for two hours or more during the day.	2.19 ± 0.94
2. The time I go to bed varies from day to day.	3.23 ± 1.01
3. The time I get out of bed varies from day to day.	3.00 ± 0.95
4. I exercise until I sweat in the hour before going to bed.	1.21 ± 0.51
5. Two or three times a week, I stay in bed longer than I should.	2.84 ± 0.96
6. I use alcohol, tobacco or caffeine in the 4 hours before or after going to bed.	2.12 ± 1.37
7. Before bedtime, I do something that increases my alertness (e.g. playing video games, using the internet or cleaning).	3.48 ± 1.12
8. I am stressed, angry, sad or tense when I go to bed.	2.28 ± 0.93
9. I use my bed for things other than sleeping (e.g. watching TV, reading, eating or studying).	3.45 ± 1.12
10. I sleep in an uncomfortable bed (e.g. I have a bad mattress or pillow, a duvet that is too thick or thin)	1.87 ± 1.01
11. I sleep in an uncomfortable bedroom (e.g. too much light, too stuffy, too hot, too cold or too noisy)	2.13 ± 1.13
12. I do important things before going to bed that need my attention (e.g. paying bills, making programmes or studying).	2.43 ± 1.06
13. I think, plan, or worry in bed.	3.42 ± 1.00

SD: Standard Deviation

DISCUSSION

Sleep hygiene refers to individuals maintaining certain behaviours to improve sleep quality. These behaviours include regular sleep hours, providing a comfortable sleep environment, avoiding stressful activities before bedtime, and limiting caffeine and alcohol consumption (20). Implementation of healthy lifestyle behaviours also improves the quality of life (10). It is important for nursing students to have quality sleep hygiene both for their own lives and for the people they care for (11). However, university students frequently restrict their sleep hours for reasons such as studying, social activities, and alcohol and caffeine consumption. These behaviours are not compatible with sleep hygiene rules that support sleep health (21). The moderate level of sleep hygiene of nursing students in this study is similar to studies conducted with university students in different groups in the literature (1, 3, 11). The health status and quality of life of individuals can be improved by following sleep hygiene rules and developing healthy sleep behaviours

(7). In fact, in our study, it was observed that the quality of life sub-dimensions of the students were in the good-medium level range, and the quality of life increased significantly as the sleep pattern and health status improved. Therefore, students should have good sleep hygiene to maintain a good quality of life. Literature emphasizes that the poor sleep quality of university students significantly affects their quality of life and that educational institutions should review their internal policies to improve students' health and lifestyles (7, 9).

Considering the literature, performing actions that promote sleep, such as maintaining a regular sleep-wake schedule and regular exercise, and avoiding actions that disrupt sleep, such as daytime naps, smoking, and caffeine and alcohol consumption in the evening, can improve sleep quality and therefore quality of life (5). However, when the habits of the students in our study were examined, it was seen that the rate of doing things that increase wakefulness especially before bedtime and the rate of using the bed for things other than sleeping were high, while the rate of exercising was low. By changing their habits, students can improve their sleep hygiene, which is currently considered to be moderate, and increase their quality of life in the same direction.

In the study, it was found that first-year nursing students and those with high income had high UHI scores, that is, they had poor sleep habits. In different studies conducted in university students in the literature, it was reported that there was no significant difference between class and income levels and sleep quality and sleep hygiene (8, 11). It is thought that nursing students who are in the first years of university may have more sleep problems due to reasons such as trying to get used to the department and courses, distancing from the family and adaptation problems to the new social environment, and inadequate stress management in the first years, which may cause high UHI scores. In addition, the fact that today's generation Z spends time with technology, such as using phones, tablets, and computers before sleeping, causes bad sleep habits. In this study, the high UHI score of students with high income can be interpreted as a result of the fact that they spend more time with the latest model technological products and unlimited internet before sleep.

Students' limited knowledge of sleep health can lead to poor sleep habits and therefore poor sleep health. Sleep health is critical not only for overall health and safety but also for academic success. Students who experience sleep deprivation can experience negative consequences such as poor concentration, missing classes, and low grade point averages (21).

Table 4. Mean Scores of Sleep Hygiene Index and Quality of Life Scale According to Demographic Characteristics of Nursing Students (N=324)

Variables	SHI	PF	RDP	Pain	GHP	Vitality	SF	RDE	MH
Gender									
Female	33.4 ± 6.0	95.0 (10-100)	75.0 (0-100)	67.5 (10-100)	55.0 (5-95)	45.0 (10- 80)	75.0 (12.5- 100)	33.3 (0- 100)	60.0 (8- 92)
Male	34.5 ± 6.8	100.0 (40-100)	100.0 (0- 100)	77.5 (12.5-100)	65.0 (20-100)	55.0 (0- 100)	75.0 (37.5- 100)	100.0 (0- 100)	56.0 (12-96)
Statistics	t= −1.365 p=0.173	U = 7102.500 p = 0.000**	U= 7526.000p=0.004**	U=6828.500 p=0.000**	U=6645.000 p=0.000**	U= 7204.000p=0.001**	U= 8211.000p=0.065	U= 7087.500 p=0.000**	U=9267.500 p=0.735
Grade Level									
Grade 1 [a]	35.5 ± 5.9	100.0 (50- 100)	75.0 (0-100)	67.5 (12.5- 100)	60.0 (5-100)	40.0 (10-85)	75.0 (25-100)	33.3 (0-100)	56.0 (8- 88)
Grade 2 [b]	33.5 ± 6.3	95.0 (10-100)	75.0 (0-100)	67.5 (10- 100)	60.0 (25-85)	50.0 (10-100)	75.0 (37.5-100)	66.6 (0- 100)	56.0 (16- 92)
Grade 3 [c]	32.4 ± 5.9	95.0 (50-100)	75.0 (0-100)	67.5 (12.5- 100)	60.0 (15-95)	50.0 (15-80)	75.0 (12.5-100)	33.3 (0- 100)	60.0 (12- 92)
Grade 4 [d]	32.9 ± 6.5	100.0 (40-100)	75.0 (0-100)	57.5 (10- 100)	60.0 (20-95)	50.0 (0-95)	75.0 (25-100)	66.6 (0- 100)	56.0 (12- 96)
Statistics	F=4.409 p=0.005**a>b, c, d	χ²=2.243 p=0.524	χ²=0.832 p=0.842	χ²=2.719 p=0.437	χ²=0.814 p=0.846	χ²=6.622 p=0.085	χ²=0.619 p=0.892	χ²=17.715 p=0.001**a, c< d, a<b	χ²=3.665 p=0.300
Family Type									
Core family	34.0 (17-50)	95.0 (10-100)	75.0 (0-100)	67.5 (10- 100)	60.0 (5-95)	45.0 (0- 95)	75.0 (12.5-100)	33.3 (0-100)	56.0 (12- 96)
Extended family	30.0 (18-48)	95.0 (65-100)	75.0 (0-100)	60.0 (12.5- 100)	60.0 (25-100)	50.0 (15- 100)	75.0 (37.5-100)	66.6 (0- 100)	64.0 (12- 92)
Fragmented family	42.0 (29-46)	100.0 (70-100)	75.0 (0-100)	55.0 (10- 100)	60.0 (30-90)	55.0 (10- 70)	50.0 (37.5-100)	33.3 (0- 100)	40.0 (8- 72)
Statistics	χ²= 5.733 p=0.057	χ²= 0.085 p=0.958	χ²= 0.409 p=0.815	χ²=2.141 p=0.343	χ²=0.704 p=0.703	χ²=1.994 p=0.369	χ²=5.742 p=0.057	χ²=1.306 p=0.520	χ²=9.165 p=0.010*
Financial Status									
Income less than expenditure [a]	34.4 ± 5.5	90.0 (40-100)	75.0 (0-100)	57.5 (12.5- 100)	60.0 (20-100)	45.0 (15- 95)	75.0 (12.5-100)	33.3 (0-100)	52.0 (12- 96)
Income equals expenditure [b]	33.0 ± 6.2	95.0 (50-100)	75.0 (0-100)	67.5 (10- 100)	60.0 (5-95)	45.0 (10- 100)	75.0 (25-100)	33.3 (0- 100)	60.0 (8- 92)
Income more than expenditure [c]	36.0 ± 6.1	100.0 (10-100)	75.0 (0-100)	67.5 (10- 100)	60.0 (20-95)	50.0 (0- 95)	75.0 (37.5-100)	33.3 (0- 100)	56.0 (12- 96)
Statistics	F=5.077 p=0.007**b<c	χ²= 9.743 p=0.008**a, b<c	χ²= 0.140 p=0.933	χ²=3.530 p=0.171	χ²=0.467 p=0.792	χ²=0.371 p=0.831	χ²=1.358 p=0.507	χ²=0.080 p=0.961	χ²=3.523 p=0.172
Current Place									
At home with family	31.6 ± 7.1	100.0 (55-100)	100.0 (0-100)	67.5 (12.5- 100)	60.0 (35-95)	52.5 (0- 100)	75.0 (12.5-100)	66.6 (0-100)	60.0 (24- 96)
At home with friends	34.7 ± 6.9	100.0 (40-100)	87.5 (0-100)	56.2 (10- 100)	60.0 (15-90)	45.0 (20-75)	75.0 (37.5-100)	50.0 (0- 100)	56.0 (20- 84)
State dormitory	34.1 ± 5.9	95.0 (10-100)	75.0 (0-100)	67.5 (10- 100)	60.0 (5-100)	45.0 (10-95)	75.0 (25-100)	33.3 (0- 100)	58.0 (8- 92)
Private dormitory	32.1 ± 5.7	95.0 (50-100)	62.5 (0-100)	50.0 (12.5- 100)	52.5 (25-85)	55.0 (25- 70)	62.5 (37.5-100)	0.0 (0-100)	60.0 (40- 76)
Statistics	F=2.613 p=0.051	χ²= 8.342 p=0.039	χ²= 5.132 p=0.162	χ²=2.424 p=0.489	χ²=5.798 p=0.122	χ²=3.209 p=0.361	χ²=3.998 p=0.262	χ²=3.829 p=0.281	χ²=1.264 p=0.738
Diagnosed Chronic Disease									
No	33.0 (17-50)	100.0 (10-100)	75.0 (0-100)	67.5 (10-100)	60.0 (5-100)	50.0 (0- 100)	75.0 (12.5-100)	33.3 (0- 100)	60.0 (8- 96)
Yes	35.0 (18-47)	90.0 (55-100)	62.5 (0-100)	57.5 (10-100)	50.0 (15-80)	40.0 (10- 80)	62.5 (37.5-100)	16.6 (0- 100)	58.0 (16- 88)
Statistics	U=4483.0 p=0.386	U=3007.500 p=0.000**	U=3726.500 p=0.015**	U=3802.500 p=0.028*	U=3098.000 p=0.000**	U=3816.500 p=0.030*	U=3613.000 p=0.009**	U=3942.500 p=0.045*	U=4518.000 p=0.424
Medication Use Continuously									
No	33.0 (17-50)	100.0 (10-100)	75.0 (0-100)	67.5 (10-100)	60.0 (5-100)	50.0 (0- 100)	75.0 (12.5-100)	33.3 (0- 100)	60.0 (8- 96)
Yes	36.0 (20-50)	95.0 (55-100)	75.0 (0-100)	57.5 (10-90)	55.0 (25-75)	35.0 (10- 80)	75.0 (37.5-100)	0.0 (0- 100)	56.0 (16- 84)
Statistics	U = 2440.5 p = 0.074	U=2391.500 p=0.043*	U=2690.500 p=0.215	U=2759.500 p=0.307	U=2374.500 p=0.053	U=2396.000 p=0.057	U=2895.000 p=0.481	U=2403.000 p=0.049*	U=2800.000 p=0.357
General Sleep Pattern									
Excellent [a]	25.5 (18-38)	100.0 (65-100)	87.5 (0-100)	75.0 (12.5- 100)	57.5 (20-85)	55.0 (20- 100)	62.5 (50- 75)	100.0 (0-100)	60.0 (32-88)

Variables	SHI	PF	RDP	Pain	GHP	Vitality	SF	RDE	MH
Good [b]	30.0 (17-46)	100.0 (40-100)	75.0 (0-100)	70.0 (12.5- 100)	65.0 (20-95)	55.0 (25- 95)	75.0 (12.5-100)	83.3 (0-100)	64.0 (24-92)
Medium [c]	32.0 (21-48)	95.0 (50-100)	75.0 (0-100)	67.5 (12.5- 100)	60.0 (25-100)	45.0 (10- 95)	75.0 (37.5- 100)	33.3 (0- 100)	60.0 (8- 96)
Bad [d]	38.0 (24-50)	95.0 (40-100)	75.0 (0-100)	65.0 (10- 100)	52.5 (5-95)	35.0 (0- 95)	75.0 (25- 100)	33.3 (0- 100)	56.0 (12- 96)
Atrocious [e]	42.0 (31-50)	90.0 (10-100)	100.0 (0-100)	45.0 (10- 90)	45.0 (20-75)	30.0 (15- 55)	62.5 (37.5- 100)	33.3 (0- 100)	36.0 (12- 60)
Statistics	χ^2=69.011 p=0.000[**]b, c<d, e	χ^2=4.194 p=0.380	χ^2=6.225 p=0.183	χ^2=16.282 p=0.003[**]e< b	χ^2=21.029 p=0.000[**]c, d < b	χ^2=44.845 p=0.000[**]d<c<b,e< b	χ^2=16.046 p=0.003[**]d < b	χ^2=15.298 p=0.004[**] c, d < b	χ^2=40.664 p=0.000[**]e<c, d<b
General Health Status									
Excellent [a]	30.5 (22-40)	100.0 (90-100)	100.0 (25-100)	85.0 (42.5- 100)	82.5 (65-95)	60.0 (15- 100)	81.2 (37.5- 100)	100.0 (0- 100)	68.0 (28-96)
Good [b]	31.0 (17-48)	100.0 (40-100)	100.0 (0-100)	68.7 (10- 100)	65.0 (20-100)	50.0 (0- 85)	75.0 (12.5-100)	66.6 (0- 100)	64.0 (8-92)
Medium [c]	35.0 (20-50)	95.0 (10-100)	75.0 (0-100)	57.5 (12.5- 100)	50.0 (15-90)	45.0 (10- 95)	75.0 (25- 100)	33.3 (0- 100)	56.0 (12- 96)
Bad [d]	36.0 (31-46)	95.0 (75-100)	75.0 (0-100)	55.0 (10- 80)	35.0 (15-80)	35.0 (20- 70)	75.0 (37.5- 100)	33.3 (0- 100)	56.0 (16- 80)
Atrocious [e]	40.0 (38-41)	80.0 (40-90)	25.0 (0-75)	45.0 (45- 87.5)	35.0 (5-70)	25.0 (15- 35)	50.0 (25- 50)	0.0 (0- 66.6)	12.0 (12- 56)
Statistics	χ^2=27.472 p=0.000[**]a<e,b<c, e	χ^2=27.018 p=0.000[**]a>b> c	χ^2=21.927 p=0.000[**]c< b	χ^2=29.818 p=0.000[**]c, d< a,c<b	χ^2=102.270 p=0.000[**]a>b>c, d	χ^2=26.981 p=0.000[**]c<b	χ^2=15.919 p=0.003[**]c< b	χ^2=10.429 p=0.034[*]	χ^2=25.271 p=0.000[**]c<b
General Quality of Life									
Excellent [a]	34.0 (25-41)	100.0 (100-100)	87.5 (50-100)	90.0 (80- 100)	92.5 (80-100)	80.0 (50- 100)	75.0 (62.5- 100)	83.3 (0- 100)	76.0 (44-96)
Good [b]	30.0 (17-46)	100.0 (40-100)	75.0 (0-100)	70.0 (10- 100)	65.0 (25-90)	55.0 (10- 85)	75.0 (12.5-100)	66.6 (0-100)	68.0 (24-92)
Medium [c]	34.0 (20-50)	95.0 (10-100)	75.0 (0-100)	65.0 (12.5- 100)	55.0 (15-90)	45.0 (0- 80)	75.0 (25- 100)	33.3 (0- 100)	56.0 (8- 92)
Bad [d]	36.0 (24-50)	95.0 (40-100)	75.0 (0-100)	57.5 (35- 100)	45.0 (5-85)	35.0 (10- 65)	75.0 (25- 100)	0.0 (0- 100)	48.0 (12- 76)
Atrocious [e]	45.0 (29-46)	100.0 (90-100)	100.0 (0-100)	67.5 (10- 90)	45.0 (25-90)	45.0 (30- 95)	75.0 (37.5- 100)	0.0 (0- 100)	48.0 (16- 96)
Statistics	χ^2=29.912 p=0.000[**]b<c, d	χ^2=13.261 p=0.010[**]a>b, c, d	χ^2=8.450 p=0.076	χ^2=19.871 p=0.001[**]c<b<a,d<a	χ^2=42.221 p=0.000[**]a>b>c, d	χ^2=39.586 p=0.000[**] c, d<b,d<a	χ^2=7.803 p=0.099	χ^2=18.792 p=0.001[**] c, d< b	χ^2=43.916 p=0.000[**]c, d<bs

t: Student t test, U:Mann–Whitney U test, F:ANOVA - post hoc test (LSD), χ2: Kruskal– Wallis test - post hoc test (Mann Withney U), *p<0,05, **p<0,01

Note: Mean and SD values for parametric tests, median and min-max values for nonparametric tests. SHI: Sleep Hygiene Index, PF: Physical Function, RDP: Role Difficulties to Physical, GHP: General Health Perception, SF: Social Function, RDE: Role Difficulties to Emotional, MH: Mental Health

Table 5. The Relationship Between the Sleep Hygiene Index and Quality of Life Scale Sub-Dimensions of Nursing Students (N= 324)

		SF 36 Quality of Life Scale Sub-Dimensions							
		PF	RDP	Pain	GHP	Vitality	SF	RDE	MH
SHI	r	−0.103	-0.248[**]	-0.217[**]	-0.258[**]	-0.397[**]	-0.238[**]	-0.323[**]	-0.404[**]
	p	0.065	0.000	0.000	0.000	0.000	0.000	0.000	0.000

** p<0.001, r: Spearman korelasyon analizi

PF: Physical Function, RDP: Role Difficulties to Physical, GHP: General Health Perception, SF: Social Function, RDE: Role Difficulties to Emotional, MH: Mental Health, SHI: Sleep Hygiene Index

Furthermore, inadequate sleep can increase the risk of sleep disorders in later life (22). In the study, when the quality of life sub-dimensions and demographic characteristics were examined, it was found that female gender, having chronic diseases, poor sleep patterns and poor health status were significantly lower in the quality of life sub-dimensions. As a matter of fact, it is expected that poor sleep patterns, chronic disease, and adverse health status negatively affect the quality of life such as pain, fitness, and physical and emotional status sub-dimensions. Similar to the study finding in the literature, in a study conducted in nursing students, it was observed that physical function, pain and general health perception were lower in women (10).

The results showed that students with good general sleep patterns, students with good general health status, and students who evaluated their quality of life as good had better sleep hygiene. From this point of view, it is essential for nursing students to maintain good sleep hygiene for their own general health and academic success and to provide quality and effective health services to the people they care for. At the same time, improvements in the quality of life will be seen in students who maintain their sleep hygiene quality. As a matter of fact, the moderate correlation between the sleep hygiene index and the quality of life sub-dimensions in our study result supports this situation in accordance with the literature (4, 6, 7, 14).

CONCLUSION

In the study, it was concluded that nursing students had a moderate level of sleep hygiene, the mean scores of quality of life sub-dimensions were in the range of moderate-good level, physical function was the highest and vitality was the lowest mean score in quality of life sub-dimensions, and there was a negative relationship between sleep hygiene and sub-dimensions of quality of life except physical function. The study also showed that sleep hygiene worsened as the quality of life and health status worsened, and the quality of life improved as the sleep patterns and health status improved. In addition, It was also revealed that 1st year nursing students and those whose income was higher than their expenses had worse sleep hygiene, and female students and those with chronic diseases had lower quality of life. It is recommended that;

· the nursing students' sleep hygiene habits should be accurately assessed and interventions should be made to help them develop these habits.
· the nursing students should be educated about healthy sleep hygiene,
· increase their awareness about quitting inadequate sleep hygiene habits to improve their quality of life,
· the study be conducted in a larger population.

Ethics Committee Approval	This study was approved by Ordu University Clinical Research Ethics Committee (Date: 26.05.2023 No: 2023/ 151).
Informed Consent	Written consent was obtained from the participants.
Peer Review	Externally peer-reviewed.
Author Contributions	Conception/Design of Study- BB, BA; Data Acquisition- ; BA, BB Data Analysis/Interpretation- BB; Drafting Manuscript- ; BA, BB Critical Revision of Manuscript- BA, BB; Final Approval and Accountability- BA, BB.
Conflict of Interest	The authors have no conflict of interest to declare.
Grant Support	The authors declared that this study has received no financial support.

Author Details

Betül Bayrak
¹ Ordu University, Faculty of Health Sciences, Department of Nursing, Ordu, Türkiye

0000-0003-1437-4057 ✉

Beyza Alev
² Ordu University, Institute of Health Sciences, Department of Nursing, Ordu, Türkiye

0000-0003-3580-7958

REFERENCES

1 Odabaşoğlu ME, Dedeoğlu T, Kasırga Z, Sünbül F. Sleep hygiene in university students. Gümüşhane University Journal of Health Sciences 2017; 6(4):204-212.

2 Güneş Z. Role and strategies of sleep hygiene in promoting sleep health. Archives Medical Review Journal 2018; 27(2):188-198. DOI:10.17827/aktd.351436.

3 Gümüştakım RŞ, Kuş C, Uzkar M. Daytime sleepiness and sleep hygiene in medical faculty students. Journal of Turkish Sleep Medicine 2020; 52-62. DOI: 10.4274/jtsm.galenos.2020.94940.

4 Akyol S. The Effect Of Sleep Hygiene To Life Quality For Youth. Arel University, Istanbul, Master's Thesis, 2019.

5 Lee SA, Han SH, No YJ, Jo KD, Kwon JH, Kim JY, Shin DJ. Sleep hygiene and its association with mood and quality of life in people with epilepsy. Epilepsy Behav. 2015 Nov;52(PtA):225-229. DOI: 10.1016/j.yebeh.2015.09.011. Epub 2015 Nov 6. PMID: 26469798.

6 Aydın F. The Relationship Between Sleep Quality, Quality Of Life And Academic Self-Efficacy Of University Students. Gelisim University, Istanbul, Master's Thesis, 2020.

7 İyigün G, Angın E, Kırmızıgil B, Öksüz S, Özdil A, Malkoç M. The relationship between sleep quality, mental health, physical health, and quality of life in university students. JETR-Journal of Exercise Therapy and Rehabilitation 2017; 4(3):125-133.

8 Aysan E, Karaköse S, Zaybak A, İsmailoğlu EG. Sleep quality among undregraduate students and influencing factors. E-Journal of Dokuz Eylul University Nursing Faculty 2014; 7(3):193-198.

9 Salvi CPP, Mendes SS, Martino MMF. Profile of nursing students: Quality of life, sleep and eating habits. *Rev Bras Enferm. 2020; 73*(Suppl 1): e20190365. DOI:10.1590/0034-7167-2019-0365.

10 Güneş K, Şahin G. Determination of the relationship between healthy lifestyle behaviours and quality of life of nursing students. Manisa Celal Bayar University Journal of Institute of Health Sciences 2019; 6(4):297-303. DOI: 10.34087/cbusbed.525733.

11 Molu B, Keskin AY, Baş MT. Investigation of sleep hygiene according to nursing students' chronotype. Journal of Turkish Sleep Medicine 2021; 8(2):105-111. DOI:10.4274/jtsm.galenos.2021.06025.

12 Menekşe B. The Effects of Sleep Hygiene and Deep Breathing- Cough Exercise Training on the Quality of Sleep and Life in COPD Diagnosed Patients. Celal Bayar University, Manisa, Master's Thesis, 2018.

13 Turgay G. The Effect of Sleep Hygiene Training and Progressive Relaxation Exercise on Sleep, Quality of Life and Depression in Hemodialysis Patients. Gazi University, Ankara, Unpublished PhD Thesis, 2018.

14 Hattatoğlu DG, Aydın Ş, Aydın C, Yıldız BP. The effect of sleep hygiene and sleep deterioration on quality of life in shiftworking healthcare professionals. Archives Neuropsychitry 2021; 58(1):11-15. DOI: 10.29399/npa.24827.

15 Mastin DF, Bryson J, Corwyn R. Assessment of sleep hygiene using the Sleep Hygiene Index. Journal of Behavioral Medicine 2006; 29: 223-227. DOI: 10.1007/s10865-006-9047-6.

16 Özdemir PG, Boysan M, Selvi Y, Yıldırım A, Yılmaz E. Psychometric properties of the Turkish version of The Sleep Hygiene Index in clinical and non-clinical samples. Comprehensive Psychiatry 2015; 59: 135-140. DOI: 10.1016/j.comppsych.2015.02.001.

17 Ware JE, Sherbourne CD. The MOS 36-Item Short-Form Health Survey (SF36): I. Conceptual Framework and Item Selection. Medical Care 1987; 26: 724-735.

18 Pınar R. A new concept in health research: Quality of Life - Testing the validity and reliability of a Quality of Life Scale in chronic patients. Florence Nightingale Journal of Nursing 1995; 9(38): 84-95.

19 Bülbül E. Quality of Life of Hemodialysis Patients According to Patients, Family Members and Healthcare Personnel. Haliç University, Istanbul, Master's thesis, 2010.

20 Tang Z, Li X, Zhang Y, Li X, Zhang X, Hu M, Wang J. Psychometric analysis of a Chinese version of the Sleep Hygiene Index in nursing students in China: A cross-sectional study. Sleep Medicine 2021; 81, 253–260. DOI: 10.1016/j.sleep.2021.02.050.

21 Ditrich SK, Francis- Jimenez CM, Knibbs MD, Umali IL, Truglio- Londrigan M. Effectiveness of sleep education pgograms to improve sleep hygiene and/or sleep quality in college students: A systematic review. The Jonna Briggs Institute 2016; 108-134. DOI: 10.11124/JBISRIR-2016-003088.

22 Sejbuk M, Mirończuk-Chodakowska I, Witkowska AM. Sleep Quality: A narrative review on nutrition, stimulants, and physical activity as ımportant factors. Nutrients 2022; 14(9), 1912. DOI: 10.3390/nu14091912.