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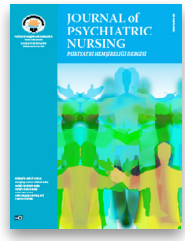

Original Article

A comparison of sleep quality, quality of life, and psychological complaints of nurses working shift work and not working shift work in a university hospital

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Abstract

Objectives: Inpatient health institutions provide continuous service. Nursing service in these institutions continues on a shift basis. The mental difficulties of working on the shift in maintaining the profession of nurse have been shown in the literature before. This study aims to emphasize the possible psychological effects of working on a shift basis and the factors that may affect the nurse's quality of life from a broad perspective.

Methods: A total of 114 nurses working on shift (n=51) and not working on change (n=63) at Tokat Gaziosmanpaşa University Hospital were included in the study. The sociodemographic data form, generalized anxiety disorder scale-7 (GAD-7), patient health questionnaire-9 (HSQ-9), Pittsburgh sleep quality index (PUKI), and Short Form-36 (SF) were filled out by the participants.

Results: No statistically significant difference existed between the GAD-7 and HSQ-9 scale mean scores and the PUKI and SF-36 subscale mean scores between the groups with and without a shift. In evaluating the PUKI total score results, it was determined that the sleep quality of the participants in both the shift-working and non-shift-working groups was poor. According to the results of the correlation analysis, the PUKI total score averages of the participants showed a positive correlation with the GAD-7 and HSQ-9 mean scores. It was determined that the mean score of the SF Mental Component (SFMC) and SF Physical Component (SFPC) showed a negative correlation with the mean score of GAD-7 and HSQ-9 for the SFPC scores of the HSA-9 scale mean scores. The GAD-7 scale mean scores were found to be predictive of SFMC scores.

Conclusion: On-shift working is ineffective on quality of life and sleep. It was determined that anxiety and depressive symptoms adversely affected the quality of life and sleep. With these results, studies on nurse quality of life and sleep quality need to be evaluated from a broader perspective.

Keywords: Anxiety; depression; life quality; nursing; sleep quality.

The total duration of sleep, the number of awakenings during the night, the depth of sleep, and the restful effect of sleep, defined as sleep quality, are affected by people who work on shift.[1] In this context, changes in sleep quality in people can lead to adverse cognitive and emotional effects. This can lead to various mental disorders such as anxiety, mood, and sleep disorders, leading to deterioration in social relations and the loss of a workforce. While sleep disorders may lead to emotional disorders, emotional disorders may also lead to sleep disturbances.[2,3] In this regard, emotional disorders may

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predispose to possible sleep disorders. Therefore, evaluating people with sleep problems, including mood symptoms, is essential.[4-6]

Due to shift work, the harmony between biological and social time is disrupted.[7] Biological disharmony may cause fluctuations in hormone levels, primarily cortisol and melatonin, which are regulated by the endogenous circadian rhythm, disruption in sleep and wakefulness cycles, and disruption in body temperature, heart rate, and blood pressure values.[8] In addition, disharmony in social rhythm may disrupt professional, family, and social life due to social isolation caused by increased daytime sleep time.[9]

Hospitals provide continuous service; therefore, it is essential to work on call. The effects of on-call work on individuals are frequently observed in nurses working in the health sector.[10] Studies conducted in Türkiye and abroad emphasize that nurses working shifts have decreased sleep quality. In these studies, it is suggested that shift work may cause many mental problems, especially mood disorders and anxiety disorders.[11-15]

In a study in which 775 nurses who worked on-call and 775 nurses who did not work on-call participated, it was found that sleep disturbance was more common in the group of nurses who worked shift work than in the group of nurses who did not work on-call work. It was determined that insomnia symptoms were more common in the on-call group and that these people had more problems falling asleep and maintaining sleep.[11]

In a study conducted in Japan, 4407 shift-based nurses were included, and the prevalence of daytime sleepiness was 26% in the study population. The relationship between daytime sleepiness and having an occupational accident in the last year was statistically significant. It was emphasized that these results are essential in showing the negative effect of daytime sleepiness on work efficiency and occupational accidents.[12]

A study conducted in a state hospital in Türkiye determined that the sleep quality of nurses working on shift was poor. It was determined that the sleep quality of nurses was affected by variables such as gender, shift change, difficulty in the night shift, and working time.[13]

In another study in Türkiye, the deterioration in sleep quality among nurses working in a university hospital was revealed. In the light of the results obtained from the study, it was concluded that gender, marital status, education level, clinic, years of work, and habits did not affect sleep quality, while older age, having children, increased years of work, and weekly working hours negatively affected sleep quality.[14]

This study aimed to investigate whether shift work affects sleep quality and quality of life, how sleep quality, depression and anxiety symptoms, and demographic characteristics are assumed to affect quality of life. The questions of the study were:

- Both sleep quality and quality of life are worse in the group of nurses working on call than in the group of nurses not working on call.
- Depression and anxiety symptom severity levels are higher in nurses working on call than in nurses not working on call.
- Depressive symptoms and anxiety symptoms have adverse effects on quality of life.

What is presently known on this subject?

- Shift work can have adverse effects on many professions, especially nursing. There are many studies in the literature on the impact of shift work, and these studies mostly point to increased anxiety and depressive symptoms and deterioration in sleep quality and quality of life.

What does this article add to the existing knowledge?

- This article broadly views the factors that may influence nurse quality of life. It draws attention to factors affecting different areas of quality of life.

What are the implications for practice?

- A study from Türkiye presents factors that may affect nurse quality of life and sleep quality. It is important because it emphasizes mental symptoms that may affect nurse quality of life and sleep.

Materials and Method

Type and Design

A cross-sectional explanatory research study was conducted.

Place and Time

The data collected by the researchers at Tokat Gaziosmanpaşa University Hospital between June 2019 and January 2020 was used.

Population and Sample

The study population consisted of 289 nurses working at Tokat Gaziosmanpaşa University Hospital. The G*Power program was used to calculate the sample size. While calculating the adequate sample size, it was concluded that 102 participants (51 per group) were required for a model with 80% statistical power, allowing 5% type-I error at a medium effect size of the mean difference between the two groups. In addition, it was calculated that 68 participants were required for a hierarchical linear regression model with a total of 6 variables and three variables as predictors, allowing 5% type-I error for a medium effect size and 80% statistical power. 114 nurses working on shift (n=51) and not working on shift (n=63) participated in the study.

Procedure

Inclusion Criteria

The inclusion criteria were completing the 1st year of the nursing career, completing at least 1 year in the same clinic, and volunteering to participate in the study.

Exclusion Criteria

Participants who received psychotropic medication with a mental disorder diagnosis and had a condition affecting work attendance for more than 2 months in the last year (such as postpartum leave) were excluded from the study.

Ethical Responsibility

With the letter numbered 22/06/2018-E.31811, permission was obtained from the Tokat Gaziosmanpaşa University Health Application Center. The study was approved by the Tokat Gaziosmanpaşa University Non-Interventional Clinical Research Ethics Committee (29.05.2019/83116987-384). Written informed consent form signatures were obtained from all participants. The study was conducted in accordance with the Declaration of Helsinki.

Data Measurement Tools

Demographic Data Form

This form was created by the researchers and consisted of questions about the participants' age, gender, department, marital status, educational status, whether they had been working on shift for the past 6 months, and years of service in the nursing profession.

Generalized Anxiety Disorder-7 Scale (GAD-7)

It was developed by Spitzer et al.[15] A Turkish validity and reliability study was performed by Konkan et al.[16] It is a self-report-based test that evaluates the symptoms of generalized anxiety disorder. It is a 7-item, four-point Likert-type scale. According to the total scores obtained from the scale, 5, 10, and 15 points are cut-off points indicating mild, moderate, and severe anxiety levels, respectively. The internal consistency coefficient in the Turkish validity study was 0.85. In our study, the internal consistency coefficient was found to be 0.89.

Patient Health Questionnaire-9

It was developed by Kroenke et al.[17] A Turkish validity and reliability study was conducted by Sari et al.[18] It consists of nine items questioning depression symptoms. Each item has a four-point Likert scale. Answers are scored with a minimum score of 0 and a maximum score of 3. A score of 1–4 is the minimum score. A score of 5–9 is interpreted as mild depression, 10–14 as moderate depression, 15–19 as moderately severe depression, and 20–27 as severe depression. In the Turkish validity study, the internal consistency coefficient was 0.84. In our study, the internal consistency coefficient was found to be 0.87.

Pittsburgh Sleep Quality Index (PUKI)

It was developed by Buysse et al.[19] to assess sleep quality during the last month. A Turkish validity and reliability study was conducted by Ağargün et al.[20] It includes a total of 24 questions. Nineteen of these are self-report questions. The partner or a roommate answers five questions, which are used only for clinical information and are not included in the scoring. The last of the self-report questions (question 19) is about the presence or absence of a roommate or partner and is not used in scoring. The total score has a value between 0 and 21. A total score higher than 5 indicates poor sleep quality. In the Turkish validity study, the internal consistency coefficient was 0.75. In our study, the internal consistency coefficient was found to be 0.78.

Short Form (SF)-36 Scale

It was developed to assess the quality of life.[21] Its Turkish validity and reliability were performed by Koçyiğit et al.[22] It consists of 8 subsections with 36 items on which patients evaluate themselves. These subsections are physical function, pain, general health, mental health, vitality, social function, and physical and emotional role limitation. The scores of all subsections range between 0 and 100 points, and low scores are associated with poor quality of life. In the Turkish validity study of the scale, the internal consistency coefficient for the scale and subscales ranged from 0.73 to 0.76. In our study, the internal consistency coefficient for the whole scale was found to be 0.89.

Data Analysis

The Shapiro–Wilk test was used to determine whether the data fit the normal distribution. The groups of nurses with and without shifts were compared regarding demographic and clinical data and the scores they obtained from the assessment tools using Student's t-test or Chi-square tests in independent groups. Bonferroni correction was applied in multiple group comparisons. The relationship between variables was examined by bivariate Pearson correlation analysis. Physical and mental health components of quality of life (SF-36) subscale scores were used as the dependent variable. In the first step of the model, demographic data (age, gender, department of employment, educational level, marital status, and length of work) were included in the model to exclude confounding effects. Depression (PHQ-9 total score) and anxiety (GAD-7 total score) levels and PUKI total score were entered as predictor variables in the second step of the model. MedCalc software was used for statistical analysis.

Results

Qualitative and quantitative data on the participants' sociodemographic characteristics according to shift work status are presented in Table 1. The mean age (35.27±6.73) in the group not working shift was found to be higher than the group working shift (27.11±3.68) ($p<0.001$). The number of female participants (n=47; 74.6%) in the group not working on shift was higher than the number of women (n=40; 78.4%) in the group working on shift ($p<0.001$). The number of married participants (n=37; 58.7%) in the group not working on shift was higher than the number of married participants (n=28; 54.9%) in the group not working on shift ($p=0.003$). The number of years of employment in the shift-working group (12.14±6.51) was higher than that in the non-shift-working group (5.83±2.86) ($p<0.001$). No significant difference was found between the groups in comparing the duration of edu-

Table 1. Comparison of sociodemographic characteristics, GAD-7, and PHQ-9 scale scores according to shift work status

		Shift work status			
	Total (n=114)	No (n=63)	Yes (n=51)	t/x²	p
Age (year±SD)	30.76±6.64	35.27±6.73	27.11±3.68	8.23	<0.001
Gender (n:female); %	87; 76.3	47; 74.6	40; 78.4	12.81	<0.001
Marital status (n: married); %	65; 57.0	37; 58.7	28; 54.9	9.08	0.003
Education (n: undergraduate); %	80; 70.2	40; 63.5	40; 78.4	3.01	0.083
Duration of study (years±SS)	8.65±5.76	12.14±6.51	5.83±2.86	6.92	<0.001
GAD-7	8.41± 5.32	8.68±5.75	8.16±5.02	0.51	0.608
PHQ-9	10.50±6.71	9.90±6.52	10.89±6.90	−0.78	0.442

GAD-7: Generalized anxiety disorder - 7 scale; PHQ-9: Patient health questionnaire - 9 scale, SD: Standard deviation, t: student t-test, χ^2: Chi-square test.

cation, PHQ-9, and GAD-7 scores according to working status with shift work (p>0.05).

Due to the multiple comparisons made regarding the Pittsburgh sleep quality index (PSQI) and SF-36 subscale mean scores of the participants according to shift work status, p<0.003 was accepted for statistical significance after Bonferroni correction. As a result, no statistically significant difference was found between the groups in any of the PSQI and SF-36 assessment scales and subscale mean scores (Table 2).

According to the results of the correlation analysis, the participants' PSQI total mean scores were positively correlated with the mean scores of GAD-7 and PHQ-9 (r=0.405; 0.408). The mean scores of the SF mental component (SFMC) were negatively correlated with the mean scores of GAD-7 and PHQ-9 (r=−0.439; −0.433). Again, SF physical component (SFPC) mean scores were negatively correlated with GAD-7 and PHQ-9 (r=−0.281; −0.378). No statistically significant correlation was found between the physical and mental component scales of quality of life and sleep quality and sociodemographic data (Table 3).

The multiple linear model for the role of variables in predicting the SFPC total score is presented in Table 4. When sociodemographic characteristics, GAD-7, PHQ-9, and PSQI

Table 2. Comparison of quality of life and quality of sleep scale and subscale scores according to shift work status

	Total (n=114)	Not shift working (n=63)	Shift working (n=51)	t	p
SF PF	77.07 (20.98)	71.77 (22.89)	81.29 (18.68)	−2.40	0.018
SF PRD	55.58 (42.28)	58.16 (41.89)	54.03 (42.99)	0.51	0.612
SF ERD	59.94 (41.64)	63.33 (41.10)	58.20 (41.89)	0.65	0.516
SF ECV	50.53 (9.64)	52.00 (10.20)	49.37 (9.27)	1.44	0.154
SF MH	53.12 (9.09)	52.40 (9.84)	53.59 (8.52)	−0.69	0.493
SF SoF	48.99 (14.80)	47.40 (15.25)	50.20 (14.58)	−0.98	0.329
SF P	38.50 (23.76)	43.25 (23.50)	34.40 (23.51)	1.98	0.050
SF GHP	53.72 (9.12)	54.85 (8.85)	52.84 (9.37)	1.15	0.253
SF PCS	56.17 (12.12)	57.00 (11.77)	55.50 (12.44)	0.64	0.526
SF MCS	53.03 (11.80)	53.22 (12.28)	52.87 (11.51)	0.16	0.877
PSQI SSQ	2.52 (0.98)	2.26 (0.69)	2.73 (1.12)	−2.59	0.011
PSQI SeD	1.06 (1.02)	1.06 (0.87)	1.05 (1.14)	0.05	0.959
PSQI HSE	0.90 (1.21)	0.74 (1.16)	1.05 (1.25)	−1.34	0.184
PSQI SDi	2.46 (0.61)	2.50 (0.58)	2.44 (0.64)	0.48	0.635
PSQI SMU	1.22 (0.58)	1.24 (0.62)	1.21 (0.54)	0.31	0.760
PSQI DD	2.15 (0.76)	2.04 (0.78)	2.24 (0.73)	−1.38	0.169
PSQI SL	2.02 (0.73)	1.90 (0.65)	2.11 (0.79)	−1.53	0.128
PSQI TIS	12.32 (3.30)	11.74 (3.12)	12.83 (3.41)	−1.74	0.128

Explanation. Results are given as mean (standard deviation). Due to multiple comparisons, p<0.003 was accepted for statistical significance after Bonferroni correction. SF: Short form 36; PF, Physical functioning; PRD: Physical role difficulty; ERD: Emotional role difficulty; MH: Mental health; SoF: Social functioning; P: Pain; GHP: General health perception; PCS: Physical component score; MCS: Mental component score; PSQI: Pittsburgh sleep quality index; SSQ: Subjective sleep quality; SeD: Sleep duration; HSE: Habitual sleep efficacy; SDi: Sleep disorder; SMU: Sleep medication use; DD: Daytime dysfunction; SL: Sleep latency; TIS: Total index score; t: student t-test.

Table 3. Correlation analysis between the quality of life components, sleep quality, anxiety symptom severity, depressive symptom severity, and sociodemographic characteristics

	SF MCS	SF PCS	PSQI TIS	GAD-7	PHQ-9	Age	Gender	Department worked in	Working time
SF MCS	1								
SF PCS	0.520**	1							
PSQI TIS	−0.185	−0.068	1						
GAD-7	−0.439**	−0.281**	0.405**	1					
PHQ-9	−0.433**	−0.378**	0.408**	0.715**	1				
Age	−0.096	−0.059	−0.117	−0.024	−0.061	1			
Gender	0.029	−0.067	0.036	0.054	0.104	−0.214*	1		
Department worked in	−0.015	−0.062	0.168	−0.053	0.065	−0.614**	0.335**	1	
Working time	−0.086	−0.029	−0.141	−0.044	−0.099	0.898**	−0.279**	−0.547**	1

Explanation. *p<0.05, **p<0.01. SF: Short form; MCS: Mental component score; PCS: Physical component score; PSQI TIP: Pittsburgh sleep quality index total index score; GAD-7: Generalized anxiety disorder - 7 scale; PHQ-9: Patient health questionnaire - 9 scale.

Table 4. Regression analysis on physical component determinants of quality of life

Conclusion	Predictors	B	SH	B	t	f	r^2
SF PCS	Constant	71.661	11.703		6.123***	2.548*	0.193
	Age	−0.453	0.490	−0.243	−0.925		
	Gender	0.242	2.894	0.008	0.084		
	Department Worked in	−3.833	2.979	−0.158	−1.286		
	Education level	2.771	2.669	0.106	1.038		
	Working time	0.156	0.491	0.075	0.317		
	Marital status	−0.716	2.518	−0.029	−0.284		
	GAD-7	−0.205	0.310	−0.090	−0.661		
	PHQ-9	−0.679	0.246	−0.375	−2.762**		
	PSQI TIS	0.549	0.391	0.148	0.164		

Explanation. *p<0.05, **p<0.01, ***p<0.001. SF: Short form - 36; PCS: Physical component score; MCS: Mental component score; GAD-7: Generalized anxiety disorder - 7 scale; PHQ-9: Patient health questionnaire - 9 scale; PSQI TIS: Pittsburgh sleep quality index total index score.

total scores were entered as independent variables for the dependent variable of SFPC total score, r^2:0.193 was found. In the regression model presented, only the mean score of the PHQ-9 scale (β:−0.375; p<0.001) made a statistically significant contribution, while sociodemographic characteristics, GAD-7, and PSQI mean scores did not make a statistically significant contribution to the regression model.

The multiple linear regression model for the role of variables in predicting the total score of SFMC is presented in Table 5. When sociodemographic characteristics, GAD-7, PHQ-9, and PSQI total scores were entered as independent variables for the dependent variable of the SFMC total score, r^2=0.25 was found. In the regression model presented, only GAD-7 scale mean scores (β:−0.293; p<0.05) made a statistically significant contribution to the model, while sociodemographic characteristics, PHQ-9, and PSQI total scores did not make a statistically significant contribution to the model.

Discussion

Shift work may have many negative repercussions on professional groups, especially nursing, such as deterioration in sleep quality, mood disorders, anxiety disorders, and a low quality of life. This study aimed to determine the effects of shift work on quality of life and sleep quality, as well as sociodemographic characteristics and mental complaints that may lead to deterioration in quality of life and sleep. In the study, the mean scores of the PSQI and SF-36 subscale scores of the groups with and without shift work were compared, and no statistically significant difference was found between the groups. PSQI total scores were higher than 5 in both shift and non-shift groups, and sleep quality was poor. According to the results of the correlation analysis, it was found that the participants' PSQI total mean scores were positively correlated with the mean scores of GAD-7 and PHQ-9. In contrast, the mean scores of SFMC and SFPC were negatively correlated with the mean scores of GAD-7 and PHQ-9. PHQ-9 scale mean scores

Table 5. Regression analysis on mental component determinants of quality of life

	Predictors	B	SE	B	t	f	r2
KF MCS	Constant	72.679	10.991		6.091***	3.736***	0.257
	Age	−0.376	0.423	−0.212	−0.887		
	Gender	2.471	2.706	0.088	0.913		
	Department worked in	−4.127	2.811	−0.173	−1.468		
	Education level	2.243	2.488	0.088	0.902		
	Working Time	0.22	0.435	0.011	0.050		
	Marital status	−1.052	2.378	−0.044	−0.442		
	GAD-7	−0.650	0.294	−0.293	−2.212*		
	PHQ-9	−0.447	0.234	−0.252	−1.910		
	PSQI TIS	0.221	0.363	0.061	0.608		

Explanation. *p<0.05, **p<0.01, ***p<0.001. SF: Short form - 36; PCS: Physical component score; MCS: Mental component score; GAD-7: Generalized anxiety disorder - 7 scale; PHQ-9: Patient health questionnaire - 9 scale; PSQI TIS: Pittsburgh sleep quality index total index score.

were found to be predictive of SFPC scores, and GAD-7 scale mean scores were found to be predictive of SFMC scores.

Studies conducted in Türkiye and other countries have emphasized that shift work in the nurse occupational group causes mental symptoms and deterioration in quality of life.[23-28] In a review of 24 studies on the effects of shift work, it was reported that it negatively affected nurses' sleep and quality of life.[29] However, studies in our country and abroad state that shift work does not lead to mental symptoms and deterioration in quality of life or that it leads to a decline in quality of life only in certain areas.[23,24,30] This study concluded that shift work did not affect quality of life, sleep quality, or depressive and anxiety symptoms. The inconsistency of the results obtained with most of the studies in the literature may be due to more years of working on shift and the marital status of the shift-working nurses in similar studies.[24,26,27] In our research, the shift-working nurses were younger and consisted of single women new to the profession. These demographic variables may be considered other factors affecting quality of life and sleep. The small number of samples in the groups in the study and the fact that the groups needed to improve caused different statistical results from other studies. However, the results obtained in this study may be a premise for focusing on other areas that may contribute to improving sleep and quality of life rather than a shift-based analysis.

The results obtained from our study suggest that the deterioration in sleep quality and quality of life will increase with the decline in emotional symptoms. Deterioration in sleep quality and quality of life may lead to damage in emotional symptoms, and deterioration in emotional symptoms may lead to deterioration in sleep and quality of life.[28-33] The factors affecting sleep and quality of life in nurses The relationship between emotional symptoms, sleep, and quality of life has also been conducted to determine factors.[34-36] In this context, as a result of the correlation analysis performed in our study, the fact that the worsening of emotional symptoms was associated with a deterioration in sleep quality and quality of life is consistent with the results of previous studies.

The last step of our study aimed to determine the predictors of the results obtained in the correlation analysis. In the regression model designed in this context, when confounding sociodemographic symptoms were excluded, it was determined that symptom severity and the severity of depressive symptoms were predictors of deterioration in quality of life. It was concluded that sociodemographic characteristics and sleep quality deterioration did not damage quality of life. Previous studies have shown that deterioration in sleep quality leads to a decline in quality of life.[34-37] Mood symptoms can lead to sleep disturbances, and sleep disturbances can lead to mood symptoms.[38-42] With our results, emotional symptoms can explain the deterioration in sleep quality. It would be appropriate to consider sleep disturbance as a part of emotional disturbance rather than an independent factor for impairment in quality of life. From this point of view, studies in the literature on the relationship between deterioration in sleep quality and decline in quality of life did not take into account an evaluation of the emotional state that may have led to this situation.[37,43-45] Again, the cross-sectional design of our study and the small number of participants in the study sample may have led to this situation.

Our study concluded that an increase in anxiety symptom severity predicted worsening in the mental component of quality of life, and an increase in depressive symptom severity was a predictor of worsening in the physical part of quality of life. The fact that the increase in the severity of anxiety and depressive symptoms is a predictor of a worsening in quality of life is consistent with the results of previous studies.[46-49] A recent review study in this field stated that different emotional symptoms might harm other areas of quality of life, such as social communication and physical deterioration.[40] This result shows that emotional symptoms may require closer and regular follow-up to increase the quality of life in the nurse professional group. The fact that the physical and mental components of quality of life may be affected by different mental symptoms may indicate that an individualized assessment

approach specific to individuals is appropriate in follow-up to improve quality of life.

Our study has some limitations. The limitations of the study include the relatively small sample size, the fact that data were collected from a single center, the fact that the data obtained from nurses were not compared with a healthy control group, the heterogeneous structure of the groups, and the fact that the data collection was cross-sectional and did not focus on a longitudinal evaluation or change after an intervention.

The fact that a study focusing on the quality of life of nurses was conducted is essential in terms of adding data on the results of nurses from Türkiye to the literature. Within a holistic approach to nurses' quality of life and sleep quality, it is noteworthy to show the relationship between sleep quality and quality of life and mental symptoms and that mental symptoms are more effective on quality of life than sleep quality. Again, the results that point out that different components of quality of life are affected by other mental symptoms are the study's strengths.

Conclusion

It was found that the deterioration in nurses' quality of life and sleep quality was associated with increased depression and anxiety severity rather than shift work. It has been shown that depressive symptom severity levels may predict impaired physical quality of life, and anxiety symptom severity levels may predict deficient mental quality of life. Therefore, focusing primarily on mood symptoms in interventions to improve nurses' quality of life and sleep may be appropriate. The results obtained from similar studies that will contribute to this study may guide the steps to be taken regarding nurses' quality of life.

Ethics Committee Approval: With the letter numbered 22/06/2018-E.31811, permission was obtained from the Tokat Gaziosmanpaşa University Health Application Center. The study was approved by the Tokat Gaziosmanpaşa University Non-Interventional Clinical Research Ethics Committee (29.05.2019/83116987-384).

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Authorship contributions: Concept – İ.G., S.A., E.A.A.; Design – İ.G., S.A., E.A.A., S.B.; Supervision – İ.G., S.B., E.A.A., S.G.; Data collection &/or processing – İ.G., S.A.; Analysis and/or interpretation – İ.G., S.A., E.A.A., S.B., S.Ç.; Literature search – İ.G., S.A., E.A.A., S.B., S.Ç.; Writing – İ.G., S.A., E.A.A.; Critical review – İ.G., E.A.A., S.B., S.Ç.

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