

# The Factors Affecting the Quality of Sleep in Shift-Working Nurses

Tae-Kyung Kim\*<sup>1</sup>, Hwa-Jung Kang<sup>2</sup>

*\*1* Professor, Department of Nursing, Dong-Eui Institute of Technology, 54, Yangji-ro, Busanjin-gu,  
Busan, 47230, South Korea

*2* Professor, Department of Nursing, Busan Women's College, 506 Jinnamro, Busanjin-gu, Busan, 47228, South  
Korea

phoebetk@sit.ac.kr\*<sup>1</sup>, olive111@hanmailnet<sup>2</sup>

## **Abstract**

**Background/Objectives:** This is descriptive research aimed at identifying the factors affecting the quality of sleep in nurses working on shifts at a general hospital.

**Methods/Statistical analysis:** Research was conducted in 141 nurses with at least 3 years of career in work on shifts at a local general hospital by using a self-administered, structured questionnaire concerning the quality of sleep, job satisfaction, and organizational commitment. Data analysis was performed through t-test, one-way ANOVA, Pearson correlation coefficient, and step wise multiple regression by using SPSS/WIN 23.0.

**Findings:** They scored 3.55+.54 out of 5 for job satisfaction, 3.28+.56 for organizational commitment, and 1.26+.87 out of 4 for the quality of sleep; the lower score, the higher quality of sleep. Job satisfaction was positively correlated with organizational commitment and was negatively correlated with the quality of sleep. Controlling the general characteristics, job satisfaction and organizational commitment significantly affected the lower quality of sleep (Odds Ratio [OR]=4.56, 95% Confidence interval [CI]=1.02-20.49; OR=0.97, 95% CI=0.94-0.99, respectively). This model accounted for 19.5% of the quality of sleep.

**Improvements/Applications:** It is necessary to develop a nursing intervention strategy for improving the quality of sleep and, consequently, job satisfaction and organizational commitment, and to develop, apply, and evaluate the effectiveness of a psychological intervention training reinforcement program that can contribute to the improvement in the quality of sleep for shift-working nurses.

**Keywords:** Work on shifts, nurse, quality of sleep, job satisfaction, organizational commitment

---

## **1. INTRODUCTION**

The hospital setting requires manpower in charge of patient nursing around the clock. In a hospital organization, nurses form the largest part of the entire manpower and provide a large portion of healthcare service. Most of them work on shifts, which characterizes the job and disturbs the regular circadian rhythm and adversely affects their physical and mental health [1]. Most of the nurses working on shifts failed to have sufficient sleep [2,3] and their sleep disturbance can not only worsen their own health status but also affect the quality of nursing and patients' safety. Sleep is a life phenomenon that occupies one third of life and is a changed state of consciousness that reduces the perception and response to stimuli as a basic life factor. Sleep is

absolutely necessary to maintain homeostasis both physically and mentally by providing rest and stability for humans. In normal adults, a 24-hour biological clock forms a drowsy activity cycle at night and an awakening in the morning. In shift work, the rhythm is broken by not being able to sleep by artificial and forced force at the time of sleep.

In particular, nurses' lack of sleep and quality of sleep reduced their commitment to the job. In addition, it can lower the quality of nursing for patients and result in higher risk of several accidents, including medication errors, wrong equipment operation, patient identification errors, and injuries with needles in nursing [4]. The lower quality of sleep can damage mental health and deteriorate commitment to nursing work. It causes nurses to become less satisfied with their work or organization, directly affecting the quality of healthcare and nursing service. As professionals significantly responsible for the quality of nursing for patients, nurses need to be satisfied with their own job with the objective of meeting the targets' needs for health effectively. Inevitably lowered quality of sleep due to working on three shifts affects their satisfaction with and commitment to the job. The most typical problem for workers on shifts is sleep disturbance. 59-76% of nurses working on three shifts experienced lowered quality of sleep [5]. The quality of sleep means the state of good or bad sleep; the former means sleeping well; the quality of sleep is evaluated on the basis of the difficulty in falling asleep and in continuing to sleep, the depth of sleep, the state after awakening, the effects on daily life, satisfaction with sleep, and so on. The poor quality of sleep affects daily areas, including workplace, home, and social life, and reduces concentration and satisfaction [6]. Job satisfaction refers to positive emotion of being satisfied with job or work and enables one to work effectively, contributing to better interpersonal relationships and higher productivity within an organization. Job dissatisfaction may lead to stress and be significantly correlated with the quality of sleep [7]. Failure to become satisfied with job can reduce personal commitment to job and lead to stress and demotivation. Organizational commitment affects work performance. In particular, the quality of sleep has negative effects. Organizational commitment affects work performance and negatively affects sleep quality. Organizational commitment is a distinction from organizational commitment and job satisfaction. Organizational b commitment is the degree to which an individual identifies his or her job, actively participates in the job, and performance is important to his self-worth. People with high organizational commitments prefer their jobs and do their best in their jobs[8,9]. In other words, organizational commitment is an important attitude variable that determines organizational performance as one of the factors of work performance along with organizational commitment and job satisfaction. In particular, the degree of organizational commitment is not simply a difference in attitudes for nurses who provide direct care to patients. Job involvement affects the quality of nursing, which in turn leads to patient safety issues[8,10]. Shift work nurses are compared with fixed workers due to changes in biorhythms due to shift work, which leads to lower job satisfaction, which can lead to organizational commitment and further affect the effectiveness of nursing work[11,12]. Nurses working on three shifts are expected to provide high-quality nursing service to patients through organizational commitment and make efficient nursing performance by managing the quality of sleep. This study aimed to determine the quality of sleep, examine the effects of organizational commitment and job satisfaction on the quality of sleep, and, ultimately, provide basic data that could help develop an intervention program to improve the quality of sleep in nurses working on shifts.

## **2. MATERIALS AND METHODS**

This is descriptive research aimed at determining the quality of sleep and at identifying its factors in nurses working on shifts at a general hospital.

### **2.1. Subjects and data collection**

This study was conducted from March 10 to April 9, 2019 and convenience sampling was performed among nurses working on shifts at a local general hospital in B City. The researcher personally gave the participants an explanation about the purport and objectives of the study and those consenting to help collect data were given an explanation about the contents of the self-administered questionnaire and were asked to complete it; then the researcher collected it immediately. The A survey was conducted in 150 nurses who understood the purpose of the study and consented to participation; a total of 141 questionnaires were analyzed, with the exception of 9 containing unanswered items.

### **2.2. Instrument**

#### **2.2.1. Job satisfaction**

Kim(2008) instrument was used to measure job satisfaction [13]. This instrument is composed of 18 items in four areas—satisfaction with job itself, wage, and bosses and colleagues and social satisfaction—and a higher score means a higher level of job satisfaction. In this study, it had Cronbach's  $\alpha = .80$  for reliability.

#### **2.2.2. Organizational commitment**

Kim (1987) translation of the organizational Commitment Questionnaire developed by Mowday et al. (1979) was used to measure organizational commitment[14]. This instrument has a five-point likert scale with 15 items; the higher score, the higher level of organizational commitment. In this study, it had Cronbach's  $\alpha = .83$  for reliability.

#### **2.2.3. Quality of sleep**

The quality of sleep inventory developed by Lee (2005) was used to measure the quality of sleep [15]. This instrument has a total of 28 items in such areas as daytime dysfunction, post-sleep recovery, difficulty in falling asleep and in awakening, sleep satisfaction, and difficulty in maintaining sleep; the higher score, the lower quality of sleep. In this study, it had Cronbach's  $\alpha = .90$  for reliability.

### **2.3. Data analysis**

The collected data were analyzed using an SPSS/WIN23.0 program. Descriptive statistics was used for the respondents' general characteristics, the quality of sleep, job satisfaction, and organizational commitment. T-test and one-way ANOVA were used for job satisfaction, organizational commitment, and the quality of sleep by the general characteristics. Pearson correlation coefficient was used for the associations among job satisfaction, organizational commitment, and the quality of sleep. Hierarchical logistic regression analysis was performed to identify the factors affecting the quality of sleep.

### 3. RESULTS AND DISCUSSION

#### 3.1. Differences in job satisfaction, organizational commitment, and quality of sleep by respondents' general characteristics

As for the respondents' general characteristics, job satisfaction of male nurses was  $3.48 \pm .55$  out of 5, and female nurses were  $3.19 \pm .54$ . The organizational commitment of male nurses was  $3.66 \pm .49$  and the female nurses was  $3.50 \pm .56$ . The sleep quality of male nurses was  $1.17 \pm .94$  and that of female nurses was  $1.30 \pm .85$ . Male nurses had higher job satisfaction and organizational commitment and better sleep quality than female nurses, but they were not statistically significant.

In the job satisfaction according to monthly income, the highest group was the highest with  $3.55 \pm .55$  points and the lowest group was the lowest with  $3.13 \pm 1.32$  points. In organizational commitment, the highest monthly income group was the highest with  $3.69 \pm .49$  points and the lowest group was the lowest with  $2.96 \pm .49$  points. The quality of sleep was the lowest in the middle group with  $1.27 \pm .91$  and the highest in the high group with  $.48 \pm .09$ . There was no statistically significant difference in job satisfaction, organizational commitment and sleep quality according to monthly income.

Employment workers' job satisfaction was  $3.25 \pm .52$  points, part-time workers were  $3.61 \pm .82$  points, and the organizational commitment was  $3.54 \pm .48$  points for the employment workers and  $3.61 \pm .82$  points for the part-time workers. The quality of sleep was  $1.28 \pm .88$  points for the employment workers and  $1.19 \pm .88$  points for the part-time workers. Employment workers showed lower job satisfaction and organizational commitment than part-time workers and poorer sleep quality, but there was no statistical difference.

No significant difference was found in job satisfaction, organizational commitment, or the quality of sleep by the respondents' general characteristics (Table 1).

**Table 1. Differences in Job Satisfaction, Organizational commitment and Sleep Quality According to Subject's General Characteristics**

	Categories	N	Job satisfaction	t or F(p)	organizational Commitment	t or F(p)	Sleep Quality	t or F(p)
Gender	Male	43	$3.48 \pm .55$	-3.029 (.063)	$3.66 \pm .49$	-1.644 (.102)	$1.17 \pm .94$	.85 (.40)
	Female	98	$3.19 \pm .54$		$3.50 \pm .56$		$1.30 \pm .85$	
Income	Low	2	$3.13 \pm 1.32$	.469 (.705)	$2.96 \pm .49$	1.972 (.121)	$.76 \pm .73$	2.275 (.083)
	Mid	26	$3.39 \pm .45$		$3.69 \pm .49$		$1.27 \pm .91$	
	High	29	$3.55 \pm .55$		$3.48 \pm .50$		$.48 \pm .09$	
	More than high	83	$3.27 \pm .58$		$3.55 \pm .55$		$.58 \pm .05$	
Employment Form	Full-time	121	$3.25 \pm .52$	-.552 (.582)	$3.54 \pm .48$	-1.616 (.108)	$1.28 \pm .88$	.420 (.675)
	Part-Time	20	$3.61 \pm .82$		$3.61 \pm .82$		$1.19 \pm .88$	

#### 3.2. Respondents' job satisfaction, organizational commitment, and quality of sleep

They scored an average of  $3.28 \pm .56$  for job satisfaction,  $3.56 \pm .54$  for organizational commitment, and  $1.26 \pm .88$  for the quality of sleep (Table 2).

**Table 2. Job Satisfaction, Organizational commitment and Sleep Quality of Subjects**

	M±SD	Min	Max
Job Satisfaction	3.28±.56	1.50	4.75
Organizational commitment	3.56±.54	2.00	5.00
Sleep Quality	1.26±.88	.00	3.86

### 3.3. Correlation among job satisfaction, job commitment, and quality of sleep

Job satisfaction was positively correlated with organizational commitment ( $r=.683$ ,  $p=.000$ ) and was negatively correlated with the quality of sleep ( $r=-.240$ ,  $p=.004$ ). Organizational commitment was negatively correlated with the quality of sleep ( $r=-.178$ ,  $p=.035$ ) (Table 3).

**Table 3. Relationship between Job Satisfaction, Organizational commitment and Sleep Quality**

	Job Satisfaction	Organizational commitment	Sleep Quality
Job Satisfaction	1		
Organizational commitment	.683(.000)	1	
Sleep Quality	-.240(.004)	-.178(.035)	1

### 3.4. Factors affecting respondents' quality of sleep

Hierarchical logistic regression analysis was performed for controlling with the order of a series of independent variable inputs to identify the factors affecting the respondents' quality of sleep (Table 4).

Controlling the general characteristics, job satisfaction and organizational commitment significantly affected the lower quality of sleep (Odds Ratio [OR]=4.56, 95% Confidence interval [CI]=1.02-20.49; OR=0.97, 95% CI=0.94-0.99, respectively). This model accounted for 19.5% of the quality of sleep.

**Table 4. Predictors Affecting Sleep Quality**

Variables	B	SE	Wald	OR	95%CI
Job Satisfaction	1.52	0.77	3.93	4.56	1.02~20.49
Organizational commitment	-0.03	0.01	5.47	0.97	0.94~0.99

#### 4. CONCLUSION

This study aimed to determine the quality of sleep, examine the effects of organizational commitment and job satisfaction on the quality of sleep, and, ultimately, provide basic data that could help develop an intervention program to improve the quality of sleep in nurses working on shifts. The quality of life was negatively correlated with organizational commitment. The results showed that male nurses had higher job satisfaction and organizational commitment than female nurses and had better sleep quality. Job satisfaction and organizational commitment of part-time workers were higher than those of employment workers, and the quality of sleep was better. There was no statistically significant difference in job satisfaction, organizational commitment and sleep quality according to general characteristics.

Job satisfaction and organizational commitment were found to be factors affecting the quality of sleep, accounting for 19.5%. On the basis of these results, it is necessary to develop a nursing intervention strategy for improving the quality of sleep and, consequently, job satisfaction and organizational commitment, and to develop, apply, and evaluate the effectiveness of a psychological intervention training reinforcement program that can contribute to the improvement in the quality of sleep for shift-working nurses.

#### REFERENCES

- [1] Lee SY, Lee JS, Kim SY, Lee JY. The effect of job stress and job satisfaction on professional self-concept in nurses. *Journal of Digital Convergence*. 2017 15(9): 273-281.
- [2] Bang BM, Lee SY, Cheong JO. Empirical study on the turn-over intention of university hospital nurses. *Journal of Digital Convergence*. 2015 13(2): 205-213. DOI:<http://dx.doi.org/10.14400/JDC>. 2015.13.2.20
- [3] Burgard SA, Alishire JA. Stressful experiences on the job and sleep quality. *Journal of Health Society Behavior*. 2009 50(4): 476-492.
- [4] Hwang EH, Kang JS. A study on Job Involvement according to working pattern and daytime sleepiness among hospital nurses. *Journal of East-West Nursing Research*. 2011 17(2): 81-86.
- [5] Kim HK, Nam CY. The effect of job stress, depression and psychological happiness on job satisfaction of office workers. *Journal of Korean Academy Society Nurses Education*. 2015 21(4): 490-498.
- [6] Kim HS, Choi KS, Eorn M, Joo EJ. Role of circadian types and depressive mood on sleep quality of shift work nurses. *The Korean Journal of Psychopharmacology*. 2011 22(2): 96-104.
- [7] Karagozoglu S, Bingol N. Sleep quality and job satisfaction on Turkish nurses. *Nursing Outlook*. 2008 56(6): 298-307.
- [8] Lee SY, Lee JS, Kim SY, Lee JY. The effect of job stress and job satisfaction on professional self-concept in nurses. *Journal of Digital Convergence*. 2017 15(9): 273-281.
- [9] Jung YJ, Kang SW. Differences in sleep, fatigue, and neurocognitive function between shift nurses and non-shift nurses. *Korean Journal of Adult Nursing*. 2017 29(2): 190-199.
- [10] Kim MS, Park YB. The influence of organizational justice on job involvement and organizational commitment perceived by nurses. *Journal of Korean Academy Nurses Administration*. 2006 12(1): 32-40.
- [11] Lee HJ, Cho YC. Relationship between job satisfaction and turnover intention among nurses in general hospitals. *Journal of the Korea Academia-Industrial*. 2014 15(7): 4404-4415.
- [12] Shim JY, Seo NS, Kim MA, Park JS. Influence of job stress, sleep quality and fatigue on work engagement

- in shift nurses. *The Korea Journal of Stress Research*. 2019 27(4) 344-352.
- [13] Kim MH. The effect of head nurse's emotional leadership on nurse's job satisfaction & organizational commitment. [master's thesis]. [Gyeong-Sang]: Gyeong-Sang National University, 2008
- [14] Kim JA. The Relationship between the Nurses' Reward Fit and Job Involvement, Organizational Commitment. *Journal of Korean Nursing Administration*. 1997 3(2) 41-58.
- [15] Ryeo YH. Development of the sleep quality scale [dissertation]. [Seoul]: Ewha Womens University. 2005