

# The Relationship between Sleep Disorders and Job Stress: A Case Study among 160 Nurses

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## Abstract

**Background:** The purpose of this study was to investigate the relationship between sleep disorders and job stress among nurses working in educational hospitals in Sanandaj. **Methods:** This cross-sectional descriptive-analytical study was conducted on 160 nurses working in educational hospitals of Kurdistan University of Medical Sciences in Sanandaj in 2014. A quotient sampling method was used to select nurses. Data were gathered using two questionnaires: Expanded Nursing Stress Scale (ENSS) and Pittsburgh Sleep Quality Index (PSQI). Then, the results were analyzed by using SPSS 16 software, independent t-test, and Spearman correlation. **Results:** 56 of the nurses (35%) were male and 104 nurses were female (65%). The results of Spearman correlation test showed that nurses' sleep quality was significantly correlated with nurses' job stress. Also, the findings of this study showed that nurses' sleep quality was significantly different in terms of working and age groups. However, nurses' job stress did not show any significant difference between different work experience and age groups. **Conclusion:** The study showed that there is a direct relationship between job stress and sleep quality in nurses. Therefore, it is necessary to identify the underlying factors that cause stress and sleep disorders and in addition to precisely planning the work shifts, preventing the increase of the volume and duration of work should be designed to eliminate them.

**Keywords:** Job stress; Sleep quality; Nurses

## Introduction

Job stress and sleep disorders are one of the most important causes of physical and psychological complications in the workplace.<sup>1-3</sup> The factors affecting job stress and sleep disorders include gender, personality differences, age, work experience, and mental status.<sup>2,4</sup> Low sleep quality and job stress reduce caution and precision at work, and therefore increase the potential risk of injury, and finally reduce time and loss of productivity.<sup>5,6</sup> According to the latest UK health and safety statistics, the prevalence of job stress in all of its various service sectors has been 1220 cases per

100,000 jobs. The results of this institute in 2014/2015 studies showed that job stress was the cause of 35% of occupational diseases and 43% of the leaves.<sup>7</sup> According to World Health Organization statistics, about 25% of worldwide workers suffer from high work stress.<sup>8</sup> Nursing is known as a stressful occupation; the prevalence of job stress in nurses is high and requires attention and reduction. In a study conducted among nurses in one of the hospitals in India, the prevalence of job stress was 87.40% in nurses.<sup>9</sup> In a study done on nurses of Hamedan Hospital, about 40% of nurses had

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psychiatric stress more than moderate, 51.50% had moderate stress and 5.90% had severe stress.<sup>10</sup> The majority of studies on nurse's quality of sleep have examined the role of work shift due to individual perception of sleep quality and the results showed that more than 57% of shift nurses have poor sleep quality.<sup>11</sup>

Sleep disorders in nurses are important because of its effect on the safety and health of the patient, and on the other hand, the effect of risk factors of nursing occupation on sleep disorders and its complications.<sup>12</sup> Irregular shifts of daytime work are one of the causes of sleep disorders in nurses, which makes them more susceptible to these disorders and complications.<sup>13</sup> The sleep quality of nurses working at hospitals is a very important issue in the health care system, long work shifts and resulting fatigue in nurses lead to lower work performance and also increase risk of medical errors that may endanger the safety of patients.<sup>14</sup> Nurses, as health providers, have to work around the clock to meet patient needs. In nursing, due to the nature of the occupation, sleep disorders and job stress can be important to the mental health and safety of both the patients and the nurses. Considering the importance of job stress and sleep disorders on the performance of nurses and in view of the above mentioned, the present study was conducted to determine the relationship between sleep disorders and job stress among nurses working at educational hospitals in Sanandaj province.

## Methods

This cross-sectional descriptive-analytic study was performed on 160 nurses working at different educational hospitals of Kurdistan University of Medical Sciences in Sanandaj in 2014. A quotient sampling method was used to select the number of samples. The criteria for entering the study were nurses working in educational hospitals affiliated to Sanandaj University of Medical Sciences with more than six months of work experience. Exclusion criteria included nurses with a history of mental illness and those who

had severe stress during the past six months, such as the death of a close relationship or divorce. Expanded Nursing Stress Scale (ENSS) questionnaire was used to collect information. The reliability of the Persian version of this questionnaire was obtained by Ghannei et al.<sup>15</sup> Pittsburgh Sleep Quality Index Questionnaire (PSQI) was used to determine sleep disorders. Validity and reliability of this study tool were studied in the study of Moghadam et al., which was obtained 72.2% for validity coefficient and 93.60% for reliability coefficient.<sup>16</sup>

Expanded Nursing Stress Scale (ENSS) Questionnaire: This questionnaire consists of 54 questions about the stress of nurses, first designed by Taft and Anderson in 1981, and then revised by Fench et al. The questionnaire consists of 9 sub-scales in the six-point Likert scale, which include death and dying, conflict with physicians, insufficient exuberance, problems with partners, problems with head nurses, workload, uncertainty about treatments, patients, and their families, and discrimination. The Cronbach's alpha coefficient for the subscales of this questionnaire was between 0.65 and 0.96.<sup>17</sup>

Pittsburgh Sleep Quality Index Questionnaire (PSQI): This questionnaire contains 9 questions about the quality of nurses' sleep, which was designed by Buysse et al. in 1989. PSQI questionnaire includes 7 sub-scales: individual sleep quality, sleep period, real-life sleep, useful sleep, sleep disorders, drug use, and bad performance throughout the day. The minimum and maximum score that can be obtained for each component is respectively zero (no problem) and three (very serious problem). It should also be noted that the overall score of sleep quality is obtained from the total score of the subscales mentioned above. A score of above 5 means poor quality and a score of less than or equal to 5 means a good state of sleep quality.<sup>18</sup>

It should be noted that questions about the demographic information of nurses such as gender, age, marital status, and work experience were also

used. The results of the study were analyzed using SPSS 16 software, independent t-test, and Spearman correlation.

**Results**

The results of this study showed that 56 were male (35%) respondents and 104 were female (65%) nurses. It is worth mentioning that 60 of respondents were single (37.50%) and 100 were married (62.50%). The results of the study also showed that 35 of the participants (21.90%) in the study were in the age group of below 26 years old, 52 (32.50%) were in the age group of 26-29 years old, 41 (25.60%) were in the age group of 30-33 and 32 (20.00%) were in the age group of above 33 years. From the work experience perspective, 69 (43.10%) of the participants in the study group had less than 5 years, 51 (31.90%) were in the group of 5-8 years, 17 (10.60%) were in the group of 9-12 years and 23 (14.40%) were in the group of more than 12 years

The results of Spearman correlation test showed that nurses' sleep quality was significantly correlated with nurses' job stress at 5% error level (P-value <0.01). Also apart from the subscales of discrimination and patients and families, the quality of nurses' sleep with other subscales of job stress was significant at the level of 5% error, and the relationship of other subscales with each other is presented in Table 2.

**Table 1.** Frequency of qualitative demographic variables in the study

Variable	Status	frequency	percentage
Age group	Lower than 26	35	21.90
	26-29	52	32.50
	30-33	41	25.60
	More than 33	32	20.00
Gender	male	56	35.00
	female	104	65.00
Marital status	single	60	37.50
	married	100	62.50
Work experience	Lower than 5	69	43.10
	5-8	51	31.90
	9-12	17	10.60
	More than 12	23	14.40

**Table 2.** Relationship between job stress variables with sleep quality and its subscales

variable	individual sleep quality	sleep period	real-life sleep	useful sleep	sleep disorders	Drug use	bad performance throughout the day	overall sleep quality
death and dying	0.10 0.18	0.10 0.21	0.06 0.42	*0.17 0.03	0.02 0.76	0.11 0.16	0.10 0.21	0.16 0.04
Conflict with physicians	0.15 0.06	*0.17 0.03	0.08 0.29	*0.18 0.02	0.11 0.16	*0.19 0.01	0.13 0.10	**0.21 0.01
insufficient exuberance	0.11 0.16	0.08 0.30	0.08 0.30	0.28** <0.01	*0.19 0.01	**0.21 0.01	0.11 0.16	**0.25 0.01
problems with partners	0.10 0.18	0.08 0.30	**0.21 0.01	0.30** <0.01	**0.21 0.01	0.30** <0.01	0.13 0.10	0.30** <0.01
problems with head nurses	0.13 0.10	0.13 0.10	0.10 0.18	**0.22 0.01	**0.22 0.01	0.14 0.06	0.18 0.02	0.24 0.01
workload	0.09 0.27	0.14 0.07	0.15 0.06	0.30** <0.01	*0.18 0.02	*0.18 0.02	*0.18 0.02	0.37** <0.01
uncertainty about Treatments	0.13 0.10	0.14 0.07	0.08 0.30	0.21** 0.01	0.13 0.10	0.13 0.10	0.15 0.05	**0.22 0.01
patients and their families	0.03 0.70	0.06 0.46	0.03 0.70	0.15 0.05	0.11 0.16	0.14 0.07	*0.16 0.01	0.15 0.05
discrimination	-0.03 0.66	-0.01 0.95	-0.08 0.34	0.04 0.65	0.05 0.52	0.06 0.44	-0.25 0.75	-0.17 0.83
Overall job stress	0.10 0.18	0.12 0.11	0.12 0.11	**0.25 0.01	0.13 0.09	*0.18 0.02	0.15 0.05	**0.24 0.01

\* Significant at an error level of 5%

\*\* Significant at an error level of 1%

**Table 3.** Comparison of occupational stress and sleep quality in different age groups

Variable	Age group	Mean(SD)	P-Value
Sleep quality	Lower than 26 (n=35)	8.14(4.08)	0.03
	26-29(n=52)	6.94(2.97)	
	30-33(n=41)	7.80(3.10)	
	More than 33(n=32)	5.90(3.23)	
Job stress	Lower than 26(n=35)	140.51(45.07)	0.26
	26-29(n=52)	141.42(37.14)	
	30-33(n=41)	146.36(35.70)	
	More than 33(n=32)	128.25(38.73)	

\* Significant at a level of 5% error

**Table 4.** Comparison of job stress and sleep quality in different work experience groups

Variable	Work experience	Mean(SD)	P-Value
Sleep quality	Lower than 5 (n=69)	7.39(3.59)	0.01
	5-8 (n=51)	7.28(3.14)	
	9-12 (n=17)	7.12(3.24)	
	More than 12 (n=22)	5.41(3.17)	
Job stress	Lower than 5 (n=69)	140.88(41.88)	0.34
	5-8(n=51)	142.61(30.41)	
	9-12(n=17)	143.64(47.01)	
	More than 12 (n=22)	127.86(41.66)	

\* Significant at a level of 5% error

**Table 5.** Comparison of job stress and sleep quality between male and female

variable	gender	Mean(SD)	P-Value
Sleep quality	Male (n=56)	6.61(3.43)	0.16
	Female (n=104)	7.56(3.38)	
Job stress	Male (n=56)	134.05(41.37)	0.17
	Female (n=104)	142.98(37.65)	

\* Significant at a level of 5% error

**Table 6.** Comparison of job stress and sleep quality between single and married

Variable	Marital status	Mean(SD)	P-Value
Sleep quality	Single (n=60)	7.70(3.69)	0.28
	Married (n=100)	6.94(3.21)	
Job stress	Single (n=60)	134.80(36.09)	0.21
	Married (n=100)	142.89(40.67)	

\* Significant at a level of 5% error

In the study, the quality of sleep in different age groups was significantly different. The quality of sleep for under-26-year-olds group was in the best condition and for the age group more than 33 years it was in the worst case. There was no significant difference in job stress among different age groups Table 3.

In this study, we compared the job stress and sleep quality in groups with different work

experience. The findings of this study showed that the quality of sleep in different groups of work experience had a significant difference. The best quality sleep status was for a group with the work experience of 5 to 8 years and the worst status was for the group with more than 12 years of experience. However, there was no significant difference between the job stresses among different groups of work experience Table 4.

In comparing the job stress and sleep quality between men and women, the results of statistical tests showed that there was no significant difference in sleep quality between men and women. However, the average quality of sleep was better for women than men. Despite the fact that job stress was higher for women than men, no significant differences were found Table 5.

Also, the findings showed that there was no significant difference in sleep quality between single and married nurses. However, the average sleep quality for single nurses was higher than married ones. Despite the fact that job stress for married people was higher than singles, there were no significant differences Table 6.

## Discussion

The aim of this study was to determine the relationship between sleep disorders with the prevalence of job stress and to identify the influential factors among 160 nurses working at educational hospitals in Sanandaj. The results of the study showed that there is a significant relationship between the qualities of nurses' sleep in comparison to nurses' job stress. Also, the results of the study showed that sleep disorders in nurses with work experience and average age of nurses had a meaningful relationship, but there was no significant difference between job stress and work experience and mean age of nurses. In a study that examined the relationship between sleep, stress, and behavioral moderation among Australian nurses, sleep difficulties and job stress were common among nurses and midwives, resulting in occupational

dissatisfaction.<sup>19</sup> A study by Jafari Rudbandi et al. in 2015 that examined the quality of sleep of nurses and shift workers at Kerman hospitals revealed that 83.20% of nurses and staff suffer from low quality of sleep, and job stress and sleepiness are the factors affecting sleeping quality of shift nurses.<sup>20</sup> A study done by Razmpa et al., aimed at investigating sleep disorders on nurses, showed that 87.7% of nurses had sleep disorders and there was a significant relationship between sleep disorders and mean age of nurses so that sleep disorders were found more in nurses under 40 years old. The results of Razmpa study were consistent with this study, and the results of this study showed that there is a significant relationship between sleep disorders and workload.<sup>12</sup> In a study titled 'the relationship between quality of sleep with mental health and medical errors in nurses' conducted in one of the hospitals in Japan, there was a significant relationship between sleep deprivation and high daily workload with overall sleep quality and increased medical errors.<sup>21</sup> In a study by Pei-Li Chien in 2013 on the quality of sleep in female nurses, those with lower educational qualifications due to occupational discrimination were at increased risk of sleeping more than nurses with higher qualifications.<sup>22</sup> In a study by Osmon et al. in 2012 on the effect of the physical factors of the work environment on the quality of sleep, there was a significant relationship between age and sleep quality, so the findings of this study were similar to those study.<sup>23</sup> In a study by Parvin et al. (2005) regarding the relationship between job stress factors and general health of nursing staff; conflict with physicians was mostly related to job stress in nurses. Moreover, marital status and working hours were significantly correlated with the severity of job stress in nurses. Therefore, the findings of the study are consistent with the findings of this study.<sup>24</sup> A study by Sahraeian et al. in 2013 entitled "Study of job stress in different parts of the hospital" showed that internal and external nurses had a significantly higher

job stress level, and there was a significant relationship among job stress, gender, and educational level.<sup>25</sup>

### Conclusion

The findings of this study showed that there is a significant relationship between sleep disorders and job stress. Therefore, according to the existing scales in the study, behavioral interventions and appropriate control strategies should be done to prevent and reduce job stress and sleep disorders, and consequently, improve the quality of services delivered to patients including the precise planning of shift work, the avoidance of increased volume and duration of work, non-discrimination in the workplace, the holding of workshops related to effective communication at work and stress management.

### Conflict of interest

No conflict of interest was reported

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