

Relationship between fatigue severity and sleep hygiene of hospital cleaning staff

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Abstract

Aim: The aim of this study was to determine (1) severity of fatigue and sleep hygiene of shift workers in the hospital and (2) the relationship between the severity of fatigue and sleep hygiene.

Material and methods: The survey was conducted between March- April 2018 among cleaning staff members working at the Training and Research Hospital. In the survey, 342 housekeeping staff who agreed with the unscored survey were reached. After receiving the required permissions from the surveying institution, the Employee Information Form, Fatigue Severity Scale and Sleep Index were used. In the evaluation of the data, mean, percentage distribution, independent t test, variance analysis and correlation were applied.

Results: There was a statistically significant relationship between fatigue severity and sleep hygiene scale scores of the employees and socio-demographic characteristics of employees ($p < 0.05$).

Conclusions: When we look at the relationship between fatigue severity and sleep hygiene of the researchers; it is observed that there is a positive correlation between the severity of fatigue and sleep hygiene, ie, as the severity of fatigue increases, sleep hygiene deteriorates and negative sleep behaviors increase.

Keywords: Hospital Staff; Fatigue Severity; Sleep Hygiene; Sleep questionnaires; Daytime Sleepiness.

INTRODUCTION

Hospitals are labor-intensive institutions. They require community health care service and are operated by multiple professions with different education levels, knowledge and needs. The main determinants of service provision in these institutions are staff members (1).

The cleaning sector is one of the main service sector branches that is present in all kinds of industrial areas, indoor and outdoor areas, public areas and private companies. Cleaning involves many different tasks. Cleaning personnel are potentially exposed to a variety of chemical, physical, biological, ergonomic and psychosocial risks. Potential risks are dependent on the kind of work and the work place. The work hours of cleaning personnel are very different and are often done outside of normal working hours such as early mornings, late evenings after the work place closed, or as a combination of different shifts. In general, it requires intensive labor force and mostly solo work. In addition, salaries and socioeconomic status are low. Fear of losing the job, contract issues and low educational level constitute additional stress factors (2).

Hospital cleaning can be characterized by the use of a wide range of products. Disinfectant products are an important group in the general cleaning products. The purpose of hospital cleaning is to ensure hygienic conditions, to comply with sanitation standards, to avoid the presence of contagious microorganisms in risky patients and to protect the health of employee (3). Disinfectants with active compounds such as formaldehyde, sodium hypochlorite or benzalconium chloride are associated with various harmful corrosive that can lead to chronic health issues (4). Cleaning requires intense labor forces and physical power. Studies have shown that cleaning is associated with significant physical risks (5,6). Most cleaning workers perform different tasks within a single working day. Cleaning tasks are associated with exhausting, painful musculoskeletal system and cardiorespiratory systems problems. According to Woods and colleagues, the main ergonomic risk factor in cleaning jobs is the workload, which causes postural defect (6).

Cleaning staff usually performs tasks that required their back to bend forward. Furthermore, daily mopping, a task that is performed by cleaning staff, leads to high static

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and dynamic force exertion to the arm, which repeats frequently. This activity results in muscle fatigue and can lead to musculoskeletal disorders (7). In addition to working in the daytime, economic and social conditions may necessitate shift-work including night shifts.

Many sectors such as health care, security, factory, telecommunication, transport and entertainment have people working in a shift system. Shift workers are faced with many physical and mental problems due to the disruption of the sleep-wake cycle and the digression from the usual work and social life (8).

Sleep disorders lead to work accidents, gastrointestinal disorders, cardiovascular diseases, cerebrovascular diseases, hypertension, diabetes, depression, anxiety, sleepiness and fatigue as well as cognitive impairments such as attention and concentration disorders (8,9).

Sleep hygiene can be defined as good sleep habits i.e. sleep-facilitating behaviors (regular exercise, maintaining a regular sleep/wake-up schedule) and avoiding behaviors (cigarettes, alcohol or caffeine intake during the evening hours, daytime sleepiness). Good sleep hygiene is important to increase sleep quality. Inadequate sleep hygiene often causes deterioration of daily activities due to lack of sleep quality and daytime vigilance. Thus, it is very important to develop and maintain sleep hygiene in employees (8,10).

Fatigue is defined as a subjective sensation involving emotional, cognitive, and behavioral components. Fatigue is a condition that limits social, occupational, educational and mental functions of an individual (11). Studies have reported that cerebrovascular diseases, coronary artery diseases, hypertension, diabetes and other health problems are more frequent notice in individuals working during the nighttime than daytime (12,13). Shift work negatively affects the quality of life due to sleepiness, fatigue, physical symptoms, as well as the inability to fulfill the requirements of social life (14,15). Turkey is rather limited in occupational health studies in nursing. Especially the cleaning staff working in the hospital seems to be in the background. It is expected that this research will shed light on research in the field of occupational health.

MATERIAL and METHODS

Purpose

There are only a few studies that determine the risks on cleaning workers in Turkey. The aim of this study was to determine (1) severity of fatigue and sleep hygiene of shift workers in the hospital and (2) the relationship between the severity of fatigue and sleep hygiene.

Research method

Purpose and Type of Research

This research was conducted in descriptive relational type.

Location and time of the research

The study was conducted between February and April 2018 in a Training and Research Hospital. The hospital has 400

cleaning employees in a three-shift system (08:00-16:00; 16:00-24:00 and 24:00-08:00). All employees were asked to participate in this study. However, only 342 employees were enrolled in the study. Some employees did not agree to participate due to time off or maternity leave

Data Collection Tools

With permissions from the researcher's institution, the cleaning personnel were presented with the Introductory Information Form, Fatigue Severity Scale and Sleep Hygiene Index.

Fatigue Severity Scale

The Fatigue Severity Scale was developed by Krupp et al. (17) in 1989 to assess fatigue in patients with multiple sclerosis. Turkish validity and reliability of fatigue severity scale Armutlu et al. (16). The instrument is composed of nine items that addresses daily situations, correlating with the social aspects of the individual, quantifying, through a score, the intensity of fatigue. Each item is scored on a Likert scale of seven points, one being "strongly disagree" and seven "strongly agree". The sum of all items can range from 9 to 63. The total score is obtained by the sum of all items added, divided by the number of assertions of the instrument, i.e., nine. A final score equal to or greater than four indicates severe fatigue. The higher the score, the greater the severity of the symptom (17).

Sleep Hygiene Index

It was developed by Mastin et al. (18). The validity and reliability of Turkish version were determined by Özdemir et al. (19). The questionnaire consists of 13 questions and is in a five-point scale (none: 1, rarely 2, sometimes 3, often 4, always 5). The index aims to evaluate sleep hygiene by questioning how often the participant does sleep behaviors that make up sleep hygiene. The scores vary between 13 and 65, and high scores indicate poorer sleep hygiene of the participant. The substances that make up the Sleep Hygiene Index are derived from diagnostic criteria for insufficient sleep hygiene in the International Classification of Sleep Disorders. The Cronbach Alpha value of Sleep Hygiene Index was calculated to be 0.70 and valid and reliable. The Cronbach Alpha value was 0.74 in this study.

Collection of Data

Data were collected between February and April 2018. Data collection forms were given to each participant during their break and/or meal hours. Employees filled in the data collection forms with took between 15-20 minutes on average.

Ethics of research

In order to carry out the research, permission was obtained from the Inonu University Health Sciences Scientific Research and Publication Ethics Committee (No=2017/7-22). Legal permission was obtained from each institution where the research was conducted. All participants were informed about the purpose and content of the study. Informed written and verbal consents were received for each participant. All procedures performed in studies involving human participants were in accordance

with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Evaluation of Data

Data entry and evaluation procedures were performed with a Statistical Package for the Social Sciences (SPSS) for Windows. The Kruskal-Wallis test was used for non-parametric tests to assess the level of Education level which did not meet the parametric test hypothesis ($n < 30$). The Kruskal-Wallis test was used to compare the mean of three or more groups. The Bonferroni Adjusted Mann-Whitney test was used in multiple comparisons after the Kruskal-Wallis test.

Normal distribution fitness of variables was investigated using analytical methods (Kolmogorov-Smirnov / Shapiro-Wilk tests). The Kruskal-Wallis test was used to assess age, Marital status, Perceived income level, Perceived health status, Number of children, Working time which met the parametric test hypothesis but not the normal distribution ($p < 0.05$). The Bonferroni Adjusted Mann-Whitney test was used to determine the group from which the difference originated. Mann-Whitney test was used to determine the group from which the difference originated.

Two independent samples-tests (Mann-Whitney) were used to evaluate the gender, Spouse's work status that met the parametric test hypothesis but not the normal distribution. In this study, Spearman correlation was used to determine the relationship between fatigue severity and sleep scale scores.

RESULTS

The socio-demographic characteristics of our study population were as followed: 40.6% were between 28-37 years old, 58.5% males, 71.3% married, 65.8% middle-income class, 50.9% primary school graduates, 50.6% were healthy, 41.6% had children, 69.85% their partners were unemployed and 31% worked for 1-10 years.

A statistically significant difference was found (Table 1) between the ages of the employees and the severity of fatigue ($p < 0.05$). In the further analysis, the difference in fatigue severity scale level was found to be associated with the relationship between the ages of 18-27 and 38-49 and between 18-27 years and 38-49 years of age.

A statistically significant difference was found (Table 2) between the age of the workers and sleep hygiene ($p < 0.05$). In the further analysis, the difference in the level of sleep hygiene scale was related to the relationship between the ages of 28-37 and 38-49.

A statistically (Table 3) significant difference was found between the gender of the employees and the fatigue severity and sleep hygiene ($p < 0.05$). Accordingly, women's fatigue severity and sleep hygiene scale scores were found to be higher. (Table 2).

Table 1. Socio-demographic characteristics of employees

Demographic Characteristics	n	%
Age group		
18-27	70	20.5
28-37	139	40.6
38-49	133	38.9
Gender		
Female	142	41.5
Male	200	58.5
Marital status		
The married	244	71.3
Single	64	18.7
Divorced	34	11.0
Perceived income level		
Low	46	13.4
Middle	225	65.8
High	71	20.8
Education level		
Primary education	174	50.9
High school	149	43.6
University	19	5.6
Perceived health status		
Good	173	50.6
Middle	132	38.6
Bad	37	10.8
Number of children		
1	52	20.2
2	107	41.6
3	58	22.6
4 and above	40	15.6
Spouse's work status		
Working	76	30.15
Not working	176	69.85
Working time		
1-5 year	106	31.0
6-10 year	106	31.0
11- 15 year	93	27.2
16 year and above	37	10.8

There was no statistically significant difference between the marital status, fatigue severity and sleep hygiene scale scores ($p > 0.05$).

There was no statistically (Table 2 and Table 3). significant difference between the perceived income level of the employees and fatigue severity and sleep hygiene scale scores ($p > 0.05$).

There was no statistically significant difference (Table 2 and Table 3) between the education level of the employees and fatigue severity and sleep hygiene scale scores ($p > 0.05$).

There was a statistically significant (Table 2 and Table

3) difference between the perceived health level of the employees and the fatigue severity scale scores ($p < 0.05$). In the further analysis, it was determined that the difference in the level of fatigue severity scale was associated with the relationship between good and bad and moderate to bad.

There was no statistically significant (Table 2) difference between the perceived health level and sleep hygiene scale scores ($p > 0.05$). There was no statistically significant difference between the number of children, fatigue severity and sleep hygiene scores ($p > 0.05$).

In the study, there was no (Table 2 and Table 3) statistically significant difference between the working status of the cleaning personnel and the fatigue severity and sleep hygiene scale scores ($p > 0.05$). A statistically significant difference was found between the study duration and

fatigue severity scale scores ($p < 0.05$). In the advanced analysis, the difference in fatigue severity scale level was found to be related to the relationship between the study period 1-5 years and 16 years and above and between 6-10 years and 16 years and above.

There was (Table 2 and Table 3) no statistically significant difference between the working hours of the workers and sleep hygiene scale scores ($p > 0.05$).

When we assessed (Table 3) the relationship between fatigue severity and sleep hygiene of the personnel; it was observed that there was a positive correlation (Sperman correlation) between the severity of fatigue and sleep hygiene, in other words, as the severity of fatigue increased, sleep hygiene deteriorated and negative sleep behaviors increased (Table 4).

Table 2. Comparison of socio-demographic characteristics and fatigue severity scale scores of cleaning personnel

Demographic Characteristics	n	X \pm SD	Median	Min-Max	p
Age group					
18-27	70	36.47 \pm 16.2	37.50	13-54	KW=15.236 § p=0.001
28-37	139	38.08 \pm 17.5	41.80	9-63	
38-49	133	41.04 \pm 16.6	42.50	9-63	
Gender					
Female	142	41.23 \pm 18.5	42.89	9-63	Z=2.046
Male	200	37.19 \pm 17.5	39.00	9-63	p=0.041
Marital status					
The married	244	38.82 \pm 21.0	41.00	9-63	KW=0.296 p=0.862
Single	64	36.59 \pm 19.5	32.65	15-42	
Divorced	34	39.70 \pm 17.3	40.00	9-63	
Perceived income level					
Low	46	41.30 \pm 18.5	45.00	9-63	KW=0.676 p=0.536
Middle	225	38.73 \pm 18.3	42.00	30-62	
High	71	36.80 \pm 17.5	37.00	9-63	
Education level					
Primary education	174	38.98 \pm 18.5	42.00	9-63	KW=0.518 p=0.772
High school	149	38.28 \pm 18.4	42.00	9-63	
University	19	40.44 \pm 18.4	45.00	9-63	
Perceived health status					
Good	173	36.75 \pm 18.7	32.00	9-63	KW=13.567 § p=0.001
Middle	132	37.95 \pm 19.1	42.00	9-63	
Bad	37	45.24 \pm 16.6	43.00	26-57	
Number of children					
1	52	36.82 \pm 20.3	40.00	9-63	KW=2.243 p=0.326
2	107	39.72 \pm 18.3	40.00	9-63	
3	58	39.72 \pm 18.3	43.50	26-63	
4 and above	40	47.10 \pm 17.3	47.00	9-63	
Spouse's work status					
Working	76	36.26 \pm 19.5	45.00	9-63	Z=7075.500 p=0.726
Not working	176	37.69 \pm 18.7	37.00	9-47	
Working time					
1-5 year	106	36.26 \pm 19.5	37.50	13-54	KW=12.272 § p=0.007
6-10 year	106	37.69 \pm 18.7	38.00	21-59	
11- 15 year	93	41.02 \pm 17.9	45.00	9-58	
16 year and above	37	44.73 \pm 18.5	45.00	9-63	

§ Kruskal Wallis Test ve ileri analizde Benferoni Adjusted ManWithney

Table 3. Comparison of socio-demographic characteristics and sleep hygiene Index scores of cleaning personnel

Demographic Characteristics	n	X± SD	Median	Min-Max	p
Age group					
18-27	70	28.59±10.0	28.00	9-65	KW=6.265 § p=0.044
28-37	139	29.28±11.0	28.50	13-65	
38-49	133	32.41±10.2	30.00	13-65	
Gender					
Female	142	32.22±14.2	30.00	13-65	Z=2.655 p=0.008
Male	200	28.57±11.1	28.00	13-56	
Marital status					
The married	244	30.93±11.4	29.00	13-49	KW=3.435 p=0.180
Single	64	29.40±12.5	27.00	13-65	
Divorced	34	33.44±14.6	34.50	9-65	
Perceived income level					
Low	46	32.30±15.8	33.00	13-63	KW=3.012 p=0.222
Middle	225	30.24±12.5	29.00	13-63	
High	71	30.17±13.2	28.00	13-65	
Education level					
Primary education	174	31.68±14.4	29.00	13-65	KW=0.602 p=0.740
High school	149	30.01±12.3	29.00	14-45	
University	19	31.47±14.4	30.00	17-39	
Perceived health status					
Good	173	29.90±13.9	28.50	17-65	KW=5.405 p=0.067
Middle	132	32.64±14.8	31.50	14-45	
Bad	37	39.62±15.2	38.00	13-65	
Number of children					
1	52	29.68±15.2	24.00	15-49	KW=0.167 p=0.920
2	107	30.51±15.7	29.00	13-49	
3	58	31.70±15.1	28.50	17-50	
4 and above	40	32.50±14.6	28.00	9-65	
Spouse's work status					
Working	76	33.30±16.0	31.00	9-63	Z=7075.500 p=0.726
Not working	176	31.52±15.5	29.50	9-47	
Working time					
1-5 year	106	29.67±16.9	29.00	21-42	KW=2.329 § p=0.507
6-10 year	106	32.62±14.9	30.50	21-50	
11- 15 year	93	34.89±19.1	29.00	13-65	
16 year and above	37	38.97±17.3	38.00	9-65	

§ Kruskal Wallis Test ve ileri analizde Benferoni Adjusted ManWithney

Table 4. Relationship between fatigue severity and sleep hygiene of cleaning personnel

Scales	Mean	Median	Min-Max	Correlation
Fatigue Severity Scale	39.03±15.1	42.00	9-63	Rho =-0.184 p<0.001
Sleep Index	29.36±9.8	28.00	13-65	

DISCUSSION

This study showed a significant relationship between the ages of the cleaning staff and the severity of fatigue and sleep hygiene. We showed that the severity of fatigue was increased with age. Duman et al also showed that fatigue increased with age (20). However, Sayın did not found a significant relationship between the age of the employees and their fatigue level (21).

A significant relationship was also found between gender and severity of fatigue. Hence, fatigue severity was increased in females, which was also reported by Duman et al. (20).

In this study, the perceived health status of the cleaning staff was significant related to the fatigue severity. Employees, whom perceived their health condition as poor, had higher fatigue severity and negative sleep hygiene habits. Duman et al. reported that chronic fatigue syndromes were higher in individuals whom perceived their health condition poor (20).

Furthermore, a significant relationship between fatigue severity and working hours was found. The fatigue severity increased as the working time of the staff increased. Terzi and Altın found a significant relationship between chronic fatigue syndrome and working time in the hospital personnel (22).

Hospital personnel are exposed to many factors that can lead to back pain such as heavy lifting, bending forward, constant standing position, and psychological stress during their work. Interestingly, 46 to 65.8% of hospital personnel reported frequent back pain (23,24). The duration of the work is related with the physical and psychological traumas, which can lead to increased fatigue severity in the cleaning staff.

In this study, there was a significant correlation found between age and sleep hygiene. As the age of worker increased, the negative sleep hygiene habits increased. Fişkın et al. did not find a significant relationship between the nurses' ages and their sleep quality (25). Chung et al. reported that sleep quality and night-and-day sleep deprivation were directly influenced by the age, and they noted that the sleep quality was low in nurses (26).

We also found a significant relationship between the gender of the cleaning staff and the severity of fatigue and sleep hygiene. The fatigue severity and the negative sleep hygiene habits were increased in female staff.

In addition, there was a significant relationship between the service span, fatigue severity and sleep hygiene of the cleaning staff. As the span of the service increased, negative sleep hygiene behaviors were increased. Previous studies have demonstrated a significant relationship between the service span of nurses and their sleep quality. As the service span of the nurses increased, the sleep quality decreased accordingly and negative sleep behaviors were manifested (25-28).

When we considered the relationship between fatigue severity of personnel and their sleep hygiene, we observed a positive correlation between fatigue severity and sleep hygiene, that as sleep fatigue increased, sleep hygiene deteriorated and negative sleep behaviors increased. Günaydın et al. found that nurses whom felt tired had significantly poor sleep quality (28).

Kara et al. observed that the sleep quality of shift workers was poor, resulting in increased complaints on life quality and somatization problems (29). In the literature, experimental studies on hospital personnel were mainly comprised of behavioral programs for sleep quality, sleep hygiene and fatigue management at specific time intervals. After completion of the programs, the workers had increased sleep duration, sleep quality, sleep hygiene and had developed methods of coping with sleeping problems. Moreover, these programs provided significant improvements in fatigue management (10,34-35).

Limitations of the research

The current research is limited on cleaning staff working in one educational research hospital. The study can be repeated with personnel working at different hospitals. Thus, the results from this study cannot be universalized.

CONCLUSION

A statistically significant relationship was found between fatigue severity, sleep hygiene scale scores, age, gender, perceived health status, number of children and working time of the cleaning personnel. In addition, it was observed that the cleaning staff had a positive correlation in terms of fatigue severity and sleep hygiene, and as the severity of fatigue increased, sleep hygiene deteriorated and negative sleep behaviors increased. Based on our findings, we suggest the following recommendation for cleaning personnel: (1) regulation of the ergonomic conditions of the working environment; (2) providing cleaning personnel with training on protection against possible physical and psycho-social risks and ergonomics during working activities; (3) regular assessments of the physical and mental health; (4) helping to cope with stress, fatigue and burnout and (5) to explain the importance of sleep and sleep hygiene.

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