

# Work-Related Fatigue and the Effective Factors in the Iranian Nurses

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## A-R-T-I-C-L-E-I-N-F-O

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## A-B-S-T-R-A-C-T

**Background & Aims of the Study:** Nursing is one of the highly stressful jobs. Nurses have to provide health service, in many cases, to the patients with incurable disease. Working in such environment induces severe and permanent mental pressures, which in long-run can create fatigue and negative effects on performance of the nurses. The main objective of the present study is to survey effects of occupational fatigue and the pertinent factors on the nurses working in Kermanshah hospitals.

**Materials & Methods:** The study is a cross-sectional study conducted on 112 nurses in Kermanshah-based hospitals in 2015. Data gathering was performed using job information and demographics questionnaire and Sweden occupational fatigue inventory (SOFI). The collected data was analyzed in SPSS-16.

**Results:** The results showed that 67.9% of the nurses suffered from low and moderate fatigue, 23.2% suffered from high fatigue, and 8.9% suffered from very high fatigue. The highest mean scores of fatigue symptoms in the nurses were obtained by burnout, inability, drowsiness, yawning, and disinterest. The results showed significant relationship between occupational fatigue and its aspects. Fatigue in men was higher than that of women and it was more evident in married participants comparing with unmarried participants. In addition, nurses with masters' degree, those in evening and overnight shifts, nurses with a second job, and the participants who expressed dissatisfaction with their job and their colleagues showed more occupational fatigue.

**Conclusions:** The results showed that work-related fatigue was moderate to high in the participants. Therefore, it is recommended that nurses can consider some items to manage fatigue like reducing overworking, sleeping enough, using good nutrition and enough rest to improve the work system.

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## Background

Fatigue is a normal phenomenon that is an outcome of physical and mental activities or emotional stresses. The extent of fatigue depends on the environmental and personal

factors. Recently, a great deal of attention has been drawn to fatigue due to its unwanted consequences on people and their performance. Fatigue might be developed in a specific work period and make the individual unable and reluctant to do physical and mental works. When this condition happens, the individual's

functions will slow down, jobs will be performed slower, and performance reduces to a great deal (1,2). Fatigue is a natural issue and a function of circadian rhyme of the body; it happens in specific hours of the day and after specific activities and it is solved after having enough rest (3). The main reasons of fatigue include lack of enough sleep, changes in biological clock of the body (circadian cycle), long work hours, doing routine jobs for a long time (lack of variety and activity), and personal characteristics such as physical and mental conditions (4). Among the negative outcomes of occupational fatigue, higher rates of human error (5,6), accidents (7), damage to memory, reasoning, and decision making ability (5, 8), higher risk of anxiety, depression, mental problems (5), absence from work and inabilities are highlighted (9). Work-related fatigue is of a great importance to preserve a good relationship among nurses and patients and ensure satisfaction and safety of patients in health and medical services system (10). Generally, fatigue and stress provided by the clinical health care atmosphere are correlated (11). Job stress effect on mental health such as anxiety, depression and job satisfaction in nurses (12), Fatigue might cause improper behavior (13), absence from work (14), indifference to the patients, decrease of self-confidence, reduction of job satisfaction, and leaving the work (15). Shapiro (2004) stated that work shifts and sleep problems were effective factors to increase fatigue (16). Disorders of shift work and sleepiness (17,18), according to Rhomert, fatigue caused by doing job increases when heavy assignments are a constant part of the job. Changing rest-work schedules are inevitable and the extent of fatigue felt by the employee depends on the work load and time and rest periods (19). Lewis et al. carried out a study titled “epidemiology of fatigue in the public” and reported the range of fatigue to be between 7-45% (20). Najafi Ghazanji et al. reported that nurses under study suffered from moderate fatigue (21). Rasouli et

al. showed in their surveys that nurses of oncology and hematology wards experienced high to moderate levels of fatigue (22). In addition, Raftopoulos et al. indicated that prevalence of fatigue in nurses was 91.9% (11). Previous studies carried out in patients with chronic diseases such as cancer, MS, cardiovascular diseases, and psychological disorder, showed that fatigue is inevitable in the modern life and many people keep nagging about fatigue and some individuals have accepted fatigue as a simple and unimportant issue. (23).

#### **Aims of the study:**

Therefore, as mentioned with regard to the prevalence of fatigue and its importance, unknown aspects and effects of fatigue on the health and performance life in hospital staff, the purpose of the present study was to investigate about work-related fatigue and its effective factors on nurses working in Kermanshah hospitals.

#### **Materials & Methods**

The study was carried out as a cross-sectional study in Kermanshah hospitals in 2015. One hundred and twelve nurses working in Kermanshah hospitals were randomly selected. A demographic and job information questionnaire and SOFI (20 questionnaire) were used for data gathering. SOFI is a multi-aspect inventory to measure quality and severity of perceived severe fatigue (24,25). The questions were designed based on Likert's 11-point scale (0 = never, 10= highly agree). It consists of 5 aspects of lack of energy, physical endeavor, physical problems, lack of motivation, and drowsiness. Each aspect was examined with four questions and obtainable score in each aspect ranges from 0 to 40. Total fatigue score ranges from 0 to 200 and the higher the score of fatigue, the higher the work-related fatigue. Several surveys on different occupations have been carried out using SOFI so that the tool was considered as a reliable and standard tool (26,

27). The collected data was analyzed in SPSS-16.

## Results

Totally, 112 nurses took part in the study; mean score and standard deviation of age of women and men were  $24.8 \pm 4.86$  and  $26.18 \pm 5.6$  respectively. In addition, men and women constituted 43.8% and 56.2% of the study group; while 71.4% were unmarried and 28.6% were married (Table 1). Mean score and standard deviation of fatigue in nurses were listed in Table 2. Mean score and standard deviation of fatigue and its aspects on nurses were demonstrated in Table 3. Highest mean scores were obtained by the aspects in terms of lack of energy and drowsiness.

The analysis of situation mean score of nurse's fatigue by one – sample T-test showed, according 0.05 error level, fatigue of the nurses and aspects of them are less than average ( $p_{\text{value}} < 0.001$ ) (Table 3).

As listed in table 4, mean score and standard deviation of fatigue were higher in men and married comparing with women and unmarried respectively. Moreover, nurses with master's degree, those in evening and overnight shifts, those who had a second job, and those who were dissatisfied with their work and colleagues experienced higher fatigue.

As you can see in Table 4, the results of Mann-Whitney test showed, there was a significant difference between the genders in terms of physical effort. Also, a significant difference was seen in the lack of energy between different shifts. Average score of the energy loss during the evening shift was more than other shifts. Also in the health problems and job satisfaction with Mann-Whitney test was also a

significant difference. The findings of independent t-test showed, in the absence of motivation, there was no significant difference between second job motivation of nurses ( $P_{\text{value}} < 0.05$ ). Between demographic variables and other aspects not found significant relationship.

**Table 1) Demographics and job information of the nurses (n = 112)**

Variable	Value	F	%
Gender	M	49	43.8
	F	63	56.2
Marital status	Married	80	71.4
	Unmarried	32	28.6
Education	Associates' degree	2	1.8
	Bachelors' degree	105	93.8
	Masters' degree	4	3.6
Work-shift	Morning	29	25.9`
	Evening	8	7.14
	Overnight	14	12.5
	Rotating	61	54.46
Satisfaction with job	Positive	77	68.8
	Negative	35	31.2
Satisfaction with colleague	Positive	75	67
	Negative	37	33
Second job	Positive	25	22.3
	Negative	87	77.7

**Table 2) Occupational fatigue in the nurses (n = 112)**

Fatigue level	Fatigue score	F	%
Low	0-49	20	17.9
Moderate	50-99	56	50
High	100-149	26	23.2
Very high	150-200	10	8.9
		112	100%

**Table 3) Mean score and SD of occupational fatigue and its aspect in the nurses (n = 112)**

Aspects	Min	Max	Basis on the comparison	Mean± SD	t	P-value
Lack of energy	2	40	25	20.18±9.54	-5.33	<0.001
Physical endeavor	·	40	25	12.97±9.15	-13.90	<0.001
Physical problem	·	40	25	15.94±10.25	-9.33	<0.001
Lack of motivation	·	40	25	16.85±9.20	-9.36	<0.001
Drowsiness	3	40	25	19.34±9.61	-6.22	<0.001
Total fatigue	14	200	100	85.31±41.72	-3.72	<0.001

**Table 4) Mean score and SD of occupational fatigue and its aspects based on occupational and demographic information (n=112)**

Variable	Mode	Lack of energy	Physical endeavor	Physical problems	Lack of motivation	Drowsiness	Total fatigue
Gender	Male	20.59±10.10	15.02±8.57	17.34±10.23	18.38±9.44	20.77±9.91	92.12±41.57
	Female	19.87±9.15	11.38±9.33	14.85±10.22	15.66±8.91	18.23±9.29	80.01±41.38
	P <sub>value</sub>	0.694	0.014	0.180	0.121	0.148	0.128
Marital status	Married	20.05±8.90	12.17±8.23	17.71±12.75	17.87±11.82	20.18±11.98	82.92±35.11
	Unmarried	20.53±11.12	14.96±11.00	15.23±9.07	16.45±7.97	19.01±8.55	91.28±55.13
	P <sub>value</sub>	0.828	0.304	0.461	0.534	0.869	0.431
Education	Associates' degree	20.33±10.01	19.33±8.50	21.33±14.04	21±14.37	22.66±8.32	104.66±55
	Bachelors' degree	20.11±9.52	16.50±16.30	15.69±10.14	16.76±9.06	19.20±9.57	84.43±40.95
	Masters' degree	22±12.43	12.65±9	18.50±12.39	16.25±11.02	20.50±13.52	93.75±61.19
	P <sub>value</sub>	0.928	0.364	0.636	0.731	0.765	0.656
Work-shift	Morning	19.61±8.81	14.69±8.06	16.73±10.58	18.57±8.44	20.07±9.61	89.69±38.63
	Evening	31.50±8.10	16.25±12.57	21.25±11.29	19.25±9.91	22.25±11.26	110.50±40.26
	Overnight	24.30±9.68	15.70±4.66	16.40±7.73	19.90±7.59	23.40±7.33	99.70±1.15
	Rotating	19.19±9.46	11.79±9.71	15.94±10.25	15.68±9.57	18.36±9.78	80.33±44.15
	P <sub>value</sub>	0.037	0.081	0.606	0.331	0.279	0.268
Satisfaction with job	Positive	19.63±8.80	11.93±8.70	14.70±10.22	16.57±9.06	18.93±9.1	81.77±39.76
	Negative	21.40±11.04	15.25±9.81	18.68±9.28	17.48±9.61	20.25±10.31	93.08±45.36
	P <sub>value</sub>	0.409	0.081	0.044	0.628	0.449	0.185
Satisfaction with colleague	Positive	19.13±8.99	11.97±8.29	14.54±9.45	16.02±8.65	18.09±9.06	79.77±
	Negative	22.32±10.36	15±10.51	18.78±11.32	18.54±10.14	21.89±10.31	96.54±46.97
	P <sub>value</sub>	0.096	0.611	0.081	0.175	0.449	0.064
Second job	Positive	18.40±9.84	12±9.27	13.60±9.96	13.32±9.45	16.88±10.12	74.20±42.20
	Negative	20.70±9.45	13.25±9.15	16.62±10.29	17.87±8.92	20.05±9.40	88.50±41.27
	P <sub>value</sub>	0.290	0.478	0.171	0.029	0.104	0.131

## Discussion

Fatigue is a serious issue at work, which deserve accurate survey and examination. Since, fatigue appears to be in different forms, it cannot be evaluated by one test or based on one variable. A clear picture of physiological

feature of fatigue will be needed to measure occupational fatigue. However, the problem is that fatigue cannot be measured directly, while its symptoms are detectable. Therefore, the physiological and psychological factors that can affect on fatigue are measured (28). In the present study fatigue and the pertinent factors in the nurses working in Kermanshah hospitals

were measured. The results showed different levels of fatigue in the participants so that 67.9% of the nurses expressed low to moderate levels of fatigue, 23.2% expressed high level of fatigue, and 8.9% expressed very high level of fatigue (Table 2). Najafi Ghezljeh *et al.* reported moderate level of fatigue in the nurses (21). Rasouli *et al.* showed in their study that nurses in oncology and hematology wards suffered from moderate to high level of fatigues (22). In addition, Raftopoulos *et al.* showed that level of fatigue in nurses was 91.9% (11). In addition, long overtime hours were the cause of fatigue in the participants. Overtime work, long work shift not only increase the work load but also reduce sleep and rest time, which are the main causes of occupational fatigue and burnout (28). A study by Iida *et al.* on the employees of a Japanese productive company showed that the main factors in fatigue among the subjects were, on a descending order, high work load, changes in assignments, fear of losing job, and job accidents (29).

Results of the present study showed that mean score of occupational fatigue and its aspects were higher in nurses with a second job (Table 4). One reason for this result can be considered as increasing workloads on these nurses. Our results showed that mean scores of energy loss and drowsiness were at high level (Table 3). Najafi Ghezljeh *et al.* reported that more than two-third of the nurses did not have acceptable sleep quality (21). In addition, results of a study by Sadeghniat *et al.* showed that 75.1% of the nurses suffered from insomnia (30). Rahimpour *et al.* showed that quality of sleep of 65.7% of the participating nurses was not in good condition (31). Nazatul *et al.* reported that 58% of the nurses working in public hospitals of Malaysia suffered from low quality sleep (32). Our results indicated that the nurses who were not satisfied with their work and colleagues experienced more occupational fatigue (Table 4). Detecting the risk factors of fatigue in nurses could be effective on preventing or reducing occupational fatigue and its different

aspects, which in turn results in increasing satisfaction with the job (22). The results showed that mean scores of occupational fatigue and its aspects were higher in the nurses of the evening and overnight shifts comparing with nurses in the morning and rotating shifts. Among the factors associated with fatigue, being in the evening and overnight shifts, lack of occupational satisfaction, dissatisfaction with colleagues and having a second job are notable. Different studies have shown that psychological factors are considered as the main factors associated with occupational fatigue in more than 50% of the cases (33).

A direct statistical correlation was found between occupational fatigue and all its aspects (Table 5); so that increase in occupational fatigue results in increasing loss of energy, higher physical endeavor, higher physical problems, less motivation, and more drowsiness. A study by Hosis *et al.* showed that there was a significant relationship between occupational stress, physical and psychological problems (e.g. fatigue, insomnia, and anxiety) (34). In general and taking into account that participants were young on average, occupational fatigue in participating nurses in this study was high; which can be reason for development of occupational depression and loss of performance. Occupational fatigue should be solved by having enough rest time during the work hours because of preserving energy in long-run. Therefore, it is essential to devise proper rest time during work hours and also to pay attention to employee's needs. When natural needs of the employee are not satisfied, decrease of energy at work is expectable. In addition, individuals are supposed to feel fatigue when they are not satisfied with their work; these individuals tend to have bad temper and feel anxiety and disinterest. To deal with the problem of occupational fatigue, reducing work hours, reforming work shifts, and promoting physical exercise at work has been recommended by the Canadian Association of Safety. (4)

## Conclusion

The results showed that work-related fatigue was moderate in nurses working in Kermanshah hospitals. Therefore, it is recommended to take measures like reducing overworking and workloads, ensuring that nurses manage to sleep enough, ensuring good nutrition and job satisfaction, devising enough rest and exercising time, respective natural needs of the nurses, and improving the work system.

## Footnotes

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### Conflict of Interest:

The authors declared no conflict of interest.

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