ORIGINAL ARTICLE

The Relationship Between Job Burnout and Occupational Cognitive Failures in Nurses at Educational Hospitals of Ardabil University of Medical Sciences, Iran

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ABSTRACT

Introduction: Job burnout is a common phenomenon in health care employees who need to deal with and witness people's problems and expectations. By definition, occupational cognitive failures appear as problems in performing daily tasks like forgetting them or having difficulty in focusing on them. The present study is an attempt to investigate the relationship between job burnout and occupation cognitive failures in nurses of educational hospitals. **Methods:** This descriptive-analytic study was done in 2018 and consisted of nurses from the Ardebil Hospital (n= 2,250). Using the Cochran formula, 328 hospital nurses were selected from different units by simple random sampling method. The data were collected by two professional health experts through interviewing and completing demographic questionnaires, job burnout questionnaire, and occupational cognitive failure questionnaire. Statistical analyses was performed in SPSS19. **Results:** A total of 328 nurses participated in the study. The mean age of the subjects was 34±8 years, varying from 22 years to 58 years. Occupational cognitive failures increased with the increase in emotional exhaustion and depersonalization; while it decreased with an increase in individual accomplishment. **Conclusion:** There was a significant relationship between occupational cognitive failure and different dimensions of job burnout. In addition, different dimensions of job burnout (Emotional Exhaustion, Depersonalization, and Personal accomplishment) could be associated with possible errors in information processing (memory, attention, and functioning).

Keywords: Job Burnout, Occupational Cognitive Failure, Nurses of Hospitals

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INTRODUCTION

Job Burnout (JB) is one of the major occupational problems seen commonly in employees in the form of reaction against occupational and organizational pressures. It is an indication of a reduction in one's adaptability to stressors in the workplace (1). The problem is one of the most significant work health and safety challenges in the health care system; so that all components of the job system are closely related to burnout (2). Burnout occurs in almost all occupational groups, mostly in the occupations that require face-to-face contact with the public and especially in health and medical care employees who face people's problems and expectations (3). The JB can have a negative effect on employees' efficacy and their focus on their tasks (4). It is common in physicians and affects the physical and mental health of physicians, their efficiency, and the quality of care they provide (5). Job burnout is a three-component psychological syndrome including emotional exhaustion (inability to communicate with others), depersonalization (negative attitude to people and violence) and personal accomplishment (a person feels progress in the job) (6). The risk of JB depends on individual and occupational factors (7). It is a psychological disorder featuring chronic fatigue, various physical symptoms, sleep disturbances, feeling guilt, seclusion, diminished work and daily activities, and negative and pessimistic tendencies towards colleagues and clients. Other symptoms of JB include occupational dissatisfaction, feelings of failure and disability, persistent sense of injustice and exploitation, and reduced job performance (8). JB is also hazardous to

the health of the employees along with its effect on the work conditions (9).

To assess JB, the Maslach burnout inventory (MBI) was used. It has been also used by Nantsupawat et al. to assess nursing burnout and nurse care quality in Thai hospitals (10). In another study conducted by Shanafelt, this questionnaire was used to assess the prevalence of JB and satisfaction with work/life balance in US physicians and workers in 2014 compared to 2011(11). Burnout in nurses is mainly a delayed response to job stress and chronic stressful situations in the workplace. It can influence the nurses with lack of enough emotional energy to cope the hardship and handle different patients. Sometimes, nurses come to the conclusion that they lack the needed capabilities for the job (12). Because of stressors, nurses feel a high demand on cognitive control so that it increases the risk of cognitive failures, which in turn increase the risk to patients' health. It is believed that task-related stressors are positively related to cognitive failure at work. On the other hand, job control is believed to have a negative effect on cognitive failure at work (13). Cognitive failures can be defined as cognitive errors in performing simple tasks that individuals can perform without errors. These errors may occur in one or all three stages of the information processing (memory, attention, and functioning) (14). Cognitive failures are simple mistakes in everyday activities, such as forgotten commitments and difficulty to focus (15). Cognitive Failure Questionnaire (CFQ) is designed to assess the frequency of these errors in everyday life (16). Chronic sleepiness and fatigue are among the factors affecting cognitive performance of nurses and a cause of negligence or delay in providing care to patients (17). Human error has many causes, while in all cases the human cognitive abilities and limitations play an important role (18). In order to assess cognitive failures, the Occupational Cognitive Failure (OCF) questionnaire was used; it was also used by Yousef Zade et al. (19). This questionnaire was designed by Hassanzadeh-Rangi to study the OCF and its relationship with the dangerous actions and accidents (20). Many studies have been done on the JB and OCF; however, none of them has focused on the relationship between these two cases in the hospital staff. Therefore, the present study is aimed at investigating the relationship between JB and OCF in the nurses at the educational hospitals of Ardabil University of Medical Sciences in Iran in 2018.

MATERIALS AND METHODS

This descriptive-analytic study was done in 2018 with a study population consisted of nurses in Ardabil-based educational hospitals. The inclusion criteria for participation in the research included being a hospital nurse and willingness to participate in the research. The exclusion criteria included mental and neurological disorders. The total number of nurses in the Ardebil Hospital was 2,250; using the Cochran formula, 328 hospital nurses were selected from different units using simple random sampling method. Data collection was done by two professional health experts through interviewing and completing the questionnaires. All selected individuals participated in the study. In order to prevent unrealistic answers in completing the questionnaire, it was emphasized that the plan was purely research based and would not have any benefits or consequences for the individuals.

Demographic variables (age, job experience, education, history of neuropsychiatric disorders), JB, and OCF were investigated. Various dimensions of JB as independent variables and OCF as dependent variable were analyzed. In addition to the demographic form (age, job experience, education, history of neuropsychiatric disorder), the following questionnaires were used:

Job Burnout (JB) Standard Questionnaire

The Maslach Job Burnout Questionnaire is comprised of 22 questions and measures three factors. Emotional exhaustion is covered by the first nine questions, personal accomplishment is covered by the next eight questions, and depersonalization is measured by the next five questions. This questionnaire is based on Likert's 5-point scale. The severity of the emotions is rated from 0 (never) to 6 (very high). The scores for each of the three factors are categorized into the lower, middle, and upper groups based on the reference score. Scores less than 25 "low intensity" are considered as Emotional Exhaustion, and scores at 26-39 range are considered as "Moderate intensity". In addition, scores greater than 40 are in "High intensity" category and scores less than 6 (low intensity) are considered as depersonalization. Moreover, scores at 7-14 range represent "Moderate intensity" and scores more than 15 represent "High intensity". As to personal accomplishment, scores more than 44 represent "Low intensity", scores at 37-43 range represent "Moderate intensity", and scores less than 36 represent "High intensity". In this questionnaire, a high score for emotional exhaustion and the depersonalization, and a low score of personal accomplishment reflect the job burnout. The overall score obtained from each of these subscales cannot be added. Maslach and Jackson calculated the internal consistency of the JB questionnaire equal to 0.83 using Cronbach's alpha (6). Maslach's JB tool has already been used by a number of Iranian scholars; according to available reports, its scientific validity and reliability are confirmed. Shahhosseini et al. (2017) reported the Cronbach's alpha coefficient of the questionnaire equal to 0.83 (21).

Occupational Cognitive Failure (OCF) Standard Questionnaire

Cognitive failures occur routinely in the process of processing information at the stages of perceiving, memorizing, and moving. Human errors caused by cognitive failures may occur at one or all of the three

stages (14). Cognitive failures can lead to human error and such errors that occur doing task that a person can usually do without error. These errors occur in different cognitive areas such as memory, attention and action. The purpose of this questionnaire is to measure cognitive failures in the workplace. The questionnaire of cognitive failures has 30 questions designed based on Likert's 5-point scale (1= completely disagree; disagree = 2; no opinion = 3; agree = 4; totally agree = 5). Based on this questionnaire, the scores are added and then judged based on the severity scores of the cognitive failures. Scores between 30 and 60 represent low cognitive failures; scores between 60 and 90 represent moderate cognitive failures, and scores higher than 90 represent the high cognitive failures. Hassanzadeh et al. (2010) calculated Cronbach's alpha coefficient of the questionnaire equal to 0.7 (22). To compare the mean of quantitative variables, Independent-Sample T Test and one-way ANOVA were used and to investigate the relationship between quantitative variables, Pearson correlation was used. To evaluate the effect of demographic and JB variables on the OCF, univariate logistic regression model was used. The significant variables in univariate statistical analysis ($p<0.05$) were added to multivariate analyses for simultaneous examination.

RESULTS

Socio-demographic

The mean age of the subjects was 34.44±8.06, varying from 22 years to 58 years. The mean age of male employees was higher than that of female employees. The average work experience of the subjects was 9.46±6.94 years, with a minimum work experience of 1 year and a maximum work experience of 29 years. The mean employment history of male employees was higher than that of female employees. In addition, 8.5% of the subjects had a high school diploma or less, 77.4% had undergraduate educations and the rest had higher educations. Only eight participants had a history of disease.

Job Burnout (JB)

The mean score of Emotional exhaustion was 38.88 ± 10.51; the high severity of emotional exhaustion was observed in 82.9% of the subjects and low emotional exhaustion was observed in 3.7%. The mean score of emotional exhaustion of female employees was higher than that of male employees.

The average depersonalization score was 23.6± 5.08; the high severity of depersonalization was observed in 97% of the subjects and moderate depersonalization severity was observed in 3%. The mean score of depersonalization in female employees was higher than that in male employees.

The average personal accomplishment score was 21.93±10.48; the high severity of personal accomplishment was observed in 86% of the subjects and moderate personal accomplishment severity was observed in 9%. The mean score of personal accomplishment in female employees was higher than that in male employees.

Occupational Cognitive Failure (OCF)

The mean of OCF was 63.38±18.82; a high level of cognitive failure was observed in 8.2% of the subjects, and moderate level of cognitive failure was observed in 35.1%. In addition, 56.7% of the subjects demonstrated a low level of cognitive failure. The mean score of OCF in male employees is almost equal to that in female employees (Table I).

The relationship between Socio-Demographic, OCF and JB

None of the factors of emotional exhaustion, depersonalization, personal accomplishment and

Table I : Demographic characteristics

	Male (91)	Female (237)	
Age [mean (SD)]	37.14(8.89)	33.41(71.48)	p-value <0.001
30	25(27.5)	96(40.5)	
30-40	38(41.8)	102(43)	p-value <0.008
40	28(30.8)	39(16.5)	
Job experience	11.27(7.95)	8.76(6.39)	p-value =0.008
Education			
Diploma and under diploma	13(14.3)	15(6.3)	
High school studies and undergraduate education	58(63.7)	196(82.7)	p-value =0.001
Higher education	20(22)	26(11)	
History of Neuropsychiatric			
Yes	2(2.2)	6(2.5)	p-value =0.609
No	89(97.8)	231(97.5)	
Emotional Exhaustion [mean (SD)]	38.47(10.37)	39.03(10.08)	p-value =0.657
Low	4(4.4)	8(3.8)	
medium	14(15.4)	30(12.7)	p-value =0.718
high	731(80.2)	199(84)	
Depersonalization [mean (SD)]	22.67(5.2)	23.96(5)	p-value =0.040
Low	0(0)	0(0)	
medium	2(2.2)	8(3.4)	p-value =0.443
high	89(87.8)	229(96.6)	
Personal accomplishment [mean (SD)]	22.27(9.41)	21.8(10.88)	p-value =0.715
Low	4(4.4)	12(5.1)	
medium	9(9.9)	21(8.9)	p-value =0.934
high	78(85.7)	204(86.1)	
Occupational Cognitive Failure (OCF) [mean (SD)]	63.18(18.47)	63.46(18.98)	p-value =0.901
Low	50(54.9)	136(57.4)	
medium	35(38.5)	80(33.8)	p-value =0.639
high	6(6.6)	21(8.9)	

OCF were significantly associated with age. Only depersonalization had a significant and direct relationship with the job experience. Emotional exhaustion had a significant and direct relationship with depersonalization and OCF. Moreover, personal accomplishment had a significant and inverse relationship with the OCF (Table II).

Table II: Relationship between the Job Burnout and Occupational Cognitive Failure and Demographic characteristics

	Age	Job experience	Emotional Exhaustion	Depersonalization	Personal Accomplishment Decreased	Occupational Cognitive Failure
Age	1	0.902 p-value <0.0001	NS	NS	NS	NS
Job experience		1	NS	0.12 p-value =0.03	NS	NS
Emotional Exhaustion			1	0.682 p-value <0.0001	NS	0.422 p-value <0.0001
Depersonalization				1	NS	0.408 p-value <0.0001
Personal accomplishment					1	-0.157 p-value =0.004
Occupational Cognitive Failure						1

The results of logistic regression model showed that by increasing the level of education, the probability of OCF decreased. Higher increased emotional exhaustion and depersonalization increased the chance of OCF. Personal accomplishment is known as a protective factor against the OCF, so that with the increase in Personal accomplishment, the chance of OCF decreases.

The significant variables in the univariate model (P<0.05) were added to the multivariate model. The multivariate model showed that "emotional exhaustion", "depersonalization," and "personal accomplishment" had a significant relationship with OCF. So that "emotional exhaustion" and "depersonalization" had a direct relationship with OCF and personal accomplishment had a negative relationship with OCF. Despite the univariate model, the variable "education" had no relationship with OCF in the multivariate model (Table III).

DISCUSSION

The results showed that the OCF increased with an increase in emotional exhaustion and depersonalization. In addition, the OCF decreased with an increase in Personal accomplishment. The present study also showed that different dimensions of JB (Emotional Exhaustion, Depersonalization, and Personal accomplishment) could be associated with possible errors in information processing (memory, attention, and functioning). A high percentage of the hospital nurses had high JB in terms of emotional exhaustion and depersonalization. This might be due to repetitive activity, excessive mental work load and responsibility to high number of patients. Consistently, Nantsupawat (2016) showed that JB was high in the subjects and had a significant negative effect on the quality of patient care so that it could be a threat to the patient's safety (23). Studies have shown that JB is effective in the desire to leave the job (24). Consistently, Khoo (2017) demonstrated that there was a relationship between emotional exhaustion sources of stress in the workplace, still there was no such a relationship with socio-demographic factors (25). Khamisa (2015) maintained that burnout explained the highest amount of variance in general health of nurses. The stress related to staff issues (including poor staff management, resource inadequacy and security risks) was the most important factor in determining burnout

Table III : Relationship between the Job Burnout and Occupational Cognitive Failure and Demographic characteristics by multivariate logistic regression model

				Univariate analysis		Multivariate analysis	
Variable	categorize	No(186)	Yes(142)	Or(95% CI)	p-value	Or(95% CI)	p-value
Gender	Male	50	41	1			
	Female	136	101	0.906(0.55-1.47)	0.69		
Education	Diploma and under diploma	10	18	1		1	
	High school studies and undergraduate education	145	109	0.41(0.18-0.94)	0.03	0.43(0.16-1.15	0.094
	Higher education	31	15	0.27(0.1-0.72)	0.009	0.31(0.-1.01)	0.052
History of Neuropsychiatric	Yes	3	5	1			
	No	183	137	1.66(0.1-1.91)	0.489		
Age	(SD)	34.71(8.27)	34.09(7.79)	0.99(0.96-1.01)	0.492		
Job experience	(SD)	9.68(7.24)	9.17(6.53)	0.99(0.95-1.02)	0.512		
Emotional Exhaustion	(SD)	34.08(10.6)	42.53(8.09)	1.11(1.7-1.13)	<0.001	1.06(1.03-1.07)	<0.001
Depersonalization	(SD)	21.26(5.95)	25.39(3.37)	1.21(1.14-1.28)	<0.001	1.13(1.06-1.21)	0.001
Personal accomplishment	(SD)	23.9(7.43)	20.43(12.12)	0.97(0.95-0.99)	0.003	0.96(0.93-0.99)	0.001

The significant variables in univariate statistical analysis (p<0.05) were added to multivariate analyses for simultaneous examination

and job satisfaction in nurses and probably other health professionals. Clearly, burnout affects the mental health and wellbeing of nurses and in turn it compromises productivity, performance, and the quality of care (26). Stressors felt by nurses causes a high demand on cognitive control. It therefore, may increase the risk of cognitive failures and cause higher risks to patients. It is believed that task-related stressors are positively associated with cognitive failure at work; while, job control is expected to have a negative relationship with cognitive failure at work. Elfering (2011) demonstrated the relationship between job characteristics and work-related cognitive failure (27). Moreover, the highest percentage of the nurses had a low severity of the OCF. Researches have revealed that emotional climate, work stress, and OCF are positively correlated (28). Studying the relationship between OCF and safety performance by Hassan zadeh (2013) indicated that it can be used to predict safe or unsafe behaviors (14). The study of the relationship between workload and cognitive failures in hospital personnel by Yousef Zade et al. (2016) revealed that mental workload and cognitive failures were significantly related to each other. Mental workload causes a higher cognitive failures (29). As the findings showed, the low level of OCF can be due to a low work experience. A study conducted by Rahimian Boogar et al. (2013) showed that high workload, sleep disturbances, and psychological distress together led to nursing errors (30). The present study was limited to a state hospital. Further studies may cover of private hospitals compare their results with the present study.

CONCLUSION

There was a significant relationship between OCF and different dimensions of JB (emotional exhaustion, depersonalization, and personal accomplishment). The present study also showed that the different dimensions of JB (Emotional Exhaustion, Depersonalization, and Personal accomplishment) could be associated with possible errors in the process of information processing (memory, attention, and functioning). To prevent JB in hospital nurses, we should promote social protection, improve nurses' self-efficacy, develop and implement workplace stress management programs, improve physical working conditions, and create promotion possibilities. These measures also prevent the future occurrence of OCF in nurses by reducing mental work load and improving sleep quality. Further research exploring particular strategies for managing JB and OCF may decrease the impact of JB and OCF on general health of nurses, while also underrating absenteeism and efficiency.

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