Original Article

Examining Occupational Stress and its Related Factors in Nurses Working in the Educational Hospitals of Kashan University of Medical Sciences

Abstract

Background: Long-term occupational stress can lead to an increase in clinical errors and negative effects on nurses' health. This study aims to investigate occupational stress and its related factors in nurses working in the educational hospitals of Kashan University of Medical Sciences. **Materials and Methods:** This cross-sectional study was conducted at Kashan University of Medical Sciences in 2019, in which 350 nurses were selected by stratified random sampling. Demographic information and Hospital job Stress Assessment questionnaire (HSS) were two parts of the questionnaire. The data were analyzed using the SPSS 22 software. For statistical analysis, background variables were described first. Independent *t*-tests, ANOVA, and their nonparametric equivalents or regression models were used to investigate the relationship between the occupational stress and background variables. The correlation coefficient was then used to assess the relationship between the quantitative variables. **Results:** The results showed that the stress level of 87.71% of the nurses was at a severe level, while 12.30% of at the nurses experienced a moderate level. The total stress score was higher among women than among men, and the difference was statistically significant (t_{348}= -3.39, p = 0.001). A weak and nonsignificant negative correlation was observed between the total stress score with age (r = -.0.06, p = 0.26) and work experience (r = -0.076, p = 0.15). **Conclusions:** Considering that most of the nurses had a high level of stress, and while occupational stress plays an important part in people's life, it seems necessary to plan to reduce the level of the occupational stress in the nurses.

Keywords: *Hospitals, nurses, occupational stress*

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Introduction

Occupational stress is the stress that a person experiences due to a certain job in which he/she cannot handle the pressures related to the work environment due to working conditions and personal characteristics of the employee.[1] Today, occupational stress is a well-known problem among health care workers.[2] Nurses are on the front lines of health care providers[3] and in jobs where there is human contact where there is more stress due to unpredictable circumstances.[4] Therefore, nurses are constantly exposed to stress due to the nature of their profession[5] that challenges their career. Out of 130 stressful jobs, nursing was ranked 27th due to its effects on mental health according to Nourbala *et al.*[6]

The risk of disease transmission from patients, dealing with dying patients, heavy work responsibilities, insufficient time, high workload, long working hours, irregular shifts, insufficient salaries, lack of workplace control, poor supervision, conflicts with colleagues and patients, frequent demands, overtime,[7] and weak relationships with supervisors, colleagues, and doctors[8] have all been identified as sources of occupational stress among the nurses.

Long-term occupational stress can lead to fatigue, pessimism, inefficiency, personal failure, reduced organizational commitment, absenteeism, and ultimately poor productivity. Occupational stress reduces attention, concentration, decision-making, and judgment skills and is more likely to increase possibility of clinical errors.[5] It seriously disrupts provision of quality health care and the effectiveness of health services.[9,10]

Various studies have been conducted on the occupational stress among nurses. Baye *et al.*[11] reported a prevalence of 66.2% for

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work-related stress in a public hospital in Harar, Eastern Ethiopia. They revealed that nurses in the pediatric wards and intensive care units and those working on rotations or facing any chronic medical conditions were all suffering from significant job stress. These researchers recommended designing a strategy to implement necessary measures such as increasing the number of nurses to alleviate workload and reorganize work shifts with the aim of reducing the work-related stress among the nurses. Also, Werke *et al.*'s[12] study in an identical field demonstrated that 198 (47.8%) of the nurses were experiencing occupational stress. Notably, factors such as having children and engaging in shift work were identified as significant contributors to the nurses' stress levels. Therefore, government policymakers, stakeholders, and hospitals should collaborate to develop and implement strategies so as to alleviate the occupational stress among the nurses.

The results of the study by Yousefi *et al.*[13] in Bandar Abbas showed that nurses may be constantly exposed to high-risk behaviors due to their stressful job. To relieve the stress, policymakers should plan to deal with these kinds of pressures. Therefore, identifying the stressful factors of the environment and implementing strategies to reduce these stresses are among the most important factors that can be effective in this regard.[14] According to the importance of the issue, this study aims to investigate the occupational stress and its related factors among the nurses working in the educational hospitals of Kashan University of Medical Sciences.

Materials and Methods

This cross-sectional descriptive study was conducted in 2019 with a research population of nurses working in the hospitals affiliated to Kashan University of Medical Sciences. The sample size included 350 people using the sample size formula. The sample size was calculated using a formula for estimating a quality attribute within a finite population in respect to the following parameters: a maximum acceptable error of 0.05, a confidence level of 0.95, and a prevalence of job stress in general departments obtained from Kakemam's study found to be 0.3.[2]

Also, we used the stratified random sampling method in our study. Three hospitals affiliated with Kashan University of Medical Sciences were investigated. After obtaining approval for the implement of the plan from the Vice President of research, the total number of the nurses in the hospitals was first calculated. Then, the number of the nurses in each hospital was determined based on their proportion in each hospital. In the next step, the number of samples related to each department was determined according to the proportion of nurses working in each department according to the total number of nurses in the hospital.

The questionnaire included two parts of demographic information and its related variables and the questions derived from the hospital occupational stress assessment questionnaire. This questionnaire consisted of 35 questions including 10 subscales as follows: role overload, role underload, role incompatibility, role ambiguity, relationship with superiors and colleagues, shift work, physical factors, chemical factors, biological factors, and ergonomic factors. The questions were based on a 5-point Likert scale including a five-level response scale of never, rarely, sometimes, often, and always with a rating scale of 1 to 5. A score of 35–69 indicated low stress, 70–104 was considered as moderate stress, and 105–175 indicated severe stress. In order to compare the fields of the occupational stress and obtain the standard scores of each field, a total sum of the scores in the same field was divided by the number of questions in that field. In Tavakoli *et al.*'s[15] study, the questionnaire's validity was assessed with a reliability of 0.84 using the Cronbach's alpha method.

Our inclusion criteria included at least a bachelor of nursing with a 6-month clinical experience who has consented to participate in the project while working in the hospital at the time of the project. The exclusion criteria were composed of lack of consent to continue participating in the project and incomplete questionnaires.

For statistical analysis, background variables were first described. Quantitative variables were described with central and dispersion indices, whereas qualitative variables were described with frequency distribution tables. Independent *t*-tests and ANOVA and its nonparametric equivalents or regression models were used to investigate the relationship between the occupational stress and background variables. The correlation coefficient was used to assess the relationship between the quantitative variables.

Ethical consideration

The study was approved by the Ethics Committee of Kashan University of Medical Sciences, Kashan, Iran (approval code: IR.KAUMS.REC.1394.125). Before completing the questionnaire, informed consent was obtained from the nurses.

Results

In this study, 350 nurses were covered. The majority of the participants were female (74.32%) and married (78.91%), while 64.32% of them were officially employed. The mean age and work experience were 36.36 and 8.7 years, respectively [Table 1].

The standardized scores for the occupational stress and its range are presented in Table 2. The highest mean score of occupational stress was recorded for role ambiguity, whereas role incompatibility was registered as the lowest score.

The standard scores of each field were obtained from the sum of the scores of the questions in the same field divided by the number of the questions in that field.

Table 1: Frequency distribution of the demographic variables among the nurses

Variable	Variable levels	Number (%)
Gender	Male	90 (25.71)
	Female	260 (74.32)
Type of employment	Official-contractual	225 (64.32)
	Temporary	65 (18.63)
	Non-official	60 (17.12)
Marital status	Single	74 (21.14)
	Married	276 (78.91)
Age (year)	(SD) Mean	36.36 (6.51)
Work experience (year)	(SD) Mean	8.7 (6.23)

Table 2: The central distribution indices of the standardized scores of occupational stress and its fields

Field	Mean (SD)	Minimum	Maximum
Role overload	3.68 (0.49)	1.2	5
Role underload	3.25 (0.71)	1	5
Role incompatibility	2.78 (0.48)	1.25	4
Role ambiguity	3.70 (0.58)	1.25	5
Relationship with superiors	2.9 (1.01)	1	5
Relationship with colleagues	3.66 (0.69)	1.33	5
Shift work	3.21 (1.05)	1	5
Physical factors	3.27 (0.55)	1.67	4.67
Chemical factors	3.34 (1.08)	1	5
Biological factors	3.99 (0.91)	1	5
Ergonomic factors	3.29 (0.62)	1.67	5
Total stress score	3.39 (0.35)	2.26	4.54

In this study, 307 (87.71%) nurses had a severe stress level and 43 (12.31%) ones showed a moderate stress level. 91.20% of the female nurses and 77.80% of the male nurses reported severe stress. The difference was statistically significant (x^2_1 = 11.100, p = 0.001). The difference in total stress level according to the marital status (x^2_1 = 0.131, p = 0.72) and type of employment was not significant (x^2_2 = 4.31, p = 0.12).

In examining the relationship between the demographic variables and the occupational stress, no significant correlation was observed between the total stress scores with age (r = -0.06, p = 0.26) and work experience (r = -0.076. p = 0.26). The relationship between the occupational stress score and its fields with the categorical variables is presented in Table 3.

The total stress score was higher among the females than that in the males where the difference was statistically significant (t_{348}= -3.39, p = 0.001). The scores for the role overload, role underload, role ambiguity, and shift work were higher in the females than in the males, and the difference was statistically significant. The relationship between marital status and the type of employment with the total stress score was not statistically significant; however, the total stress score was slightly higher among the temporary employees.

To investigate the relationship between several variables (the total occupational stress score with background variables), linear regression model was performed, where the total model turned up to be significant (p = 0.03). Among the background variables, only gender was significant (p = 0.002) and variables such as age, type of employment, and work experience did not reveal a significant difference. Results pertained to the regression model are presented in Table 4.

Discussion

In this study, a significant majority of nurses were found to have high stress levels, while only a small percentage reported moderate stress levels. In a study conducted in Zabul, 1.70% of the nurses had mild occupational stress, while 46.70% and 50.70% showed moderate and severe occupational stress, respectively, which is consistent with the present study.[16] However, in a study conducted in Qazvin, the level of occupational stress was moderate among most of the nurses (74.10%).[17] Also, Yousefi *et al.*[13] conducted a study in Bandar Abbas city and reported a moderate stress level among the nurses. Factors such as high workload and dealing with the death of the patients can be main causes of severe stress among the nurses.[16] Based on the results of their study, stress has affected a significant part of the employees' lives at work and organizational environment. If this situation continues for a long time, the person will gradually get tired and experience a reduction in their physical and mental energy, endanger their general health, weaken their ability, and finally will result in the employees' performance.[18]

The results indicated that the level of severe stress among the female nurses was significantly higher than that for the male nurses (x^2_1 = 11.100, p = 0.001). The observed difference was statistically meaningful (p = 0.001). In the studies conducted in Bandar Abbas[13] and Shiraz,[17] the amount of occupational stress in the female nurses was reported to be higher than that among the males. But in a study conducted in Qazvin, there was no significant relationship between the occupational stress and gender.[17] The reason for the high level of stress in the female nurses compared to that among the males may be due to the social and cultural situation, work–family conflict, and dual duties at home as a housewife and as an employee at workplace, which cause them to be exposed to stressful factors.[18]

According to the results of the study, there was no significant relationship between the total stress score and the marital status. However, in the study conducted by Yousefi *et al.*,[13] the level of occupational stress among the married was significantly lower than that among the single. Also, Samadirad *et al.*[18] reported that there was a statistically significant relationship between marriage as a safe haven for an individual and the occupational

Table 3: Relationship between occupational stress score and categorical variables

Field Variable		Role overload	Role underload	Role incompatibility	Role ambiguity	Relationship with superiors	Relationship with colleagues	Shift work	Physical factors	Chemical factors	Biological factors	Ergonomic factors	Total occupational stress score
Gender	Male (90)	3.53 (0.51)	3.12 (0.81)	2.78 (0.5)	3.49 (0.57)	2.78 (1)	3.69 (0.79)	2.89 (1)	3.31 (0.61)	3.42 (1.22)	4 (0.89)	3.22 (0.61)	3.29 (0.42)
	Female (260)	3.70 (0.50)	3.30 (0.70)	2.88 (0.49)	3.78 (0.59)	3.01 (1)	3.70 (0.71)	3.29 (1.11)	3.31 (0.49)	3.31 (1.22)	4 (0.5)	3.33 (0.61)	3.42 (0.33)
t		-3.46	-2.37	-1.08	-3.19	-1.93	0.40	-3.11	0.29	0.73	-0.55	-1.87	-3.39
df		348	348	348	347	348	348	348	348	348	348	348	348
*p**		0.001	0.018	0.278	0.002	0.055	0.687	0.002	0.767	0.463	0.583	0.062	0.001
Type of employment	Official (225)	3.70 (0.50)	3.21 (0.71)	2.79 (0.49)	3.70 (0.62)	2.89 (1)	3.70 (0.70)	3.21 (1)	3.31 (0.49)	3.38 (1.11)	4 (0.89)	3.31 (0.61)	3.38 (0.33)
	Temporary (65)	3.70 (0.50)	3.51 (0.62)	3 (0.41)	3.70 (0.59)	3.10 (0.88)	3.70 (0.70)	3.31 (0.89)	3.29 (0.61)	3.31 (0.89)	4.11 (0.78)	3.29 (0.61)	3.45 (0.31)
	Non-official (60)	3.61 (0.59)	3.12 (0.81)	2.88 (0.39)	3.70 (0.60)	3.21 (1)	3.61 (0.68)	3.21 (1.22)	3.22 (0.61)	3.28 (1.31)	3.79 (1.11)	3.40 (0.71)	3.36 (0.51)
F		1.56-2	2.58-2	5.16-2	0.34	2.37-2	1.08	0.05	0.41	0.19-2	3.24	1.36-2	2.64
df		0.211	0.077	0.006	2	0.095	2	2	2	0.826	2	0.258	2
*p***					0.713		0.342	0.954	0.665		0.04		0.073
Marital status	Single (74)	3.70 (0.50)	3.21 (0.69)	2.28 (0.49)	3.58 (0.63)	3.12 (0.89)	3.60 (0.70)	3.31 (1.11)	3.21 (0.49)	3.48 (1)	7.18 (0.82)	3.12 (0.62)	3.61 (0.4)
	Married (276)	3.70 (0.50)	3.29 (0.68)	2.78 (0.49)	3.70 (0.60)	2.91 (1)	3.70 (0.70)	3.22 (1)	3.31 (0.62)	3.31 (1.11)	3.89 (0.88)	3.31 (0.62)	3.37 (0.3)
t		-0.54-348	0.86	2.54	-2.05	0.88	-1.31	0.55	-0.81	1.14	2.77	-2.50	0.65
df		0.588	348	248	347	348	348	348	348	348	348	348	348
*p**			0.389	0.011	0.041	0.379	0.192	0.580	0.418	0.256	0.006	0.013	0.515

*=Independent samples *t*-test; **=One-way analysis of variance. Values are presented as Mean (SD)

Table 4: Linear regression results of the relationship between occupational stress score and background variables

Variable	Coefficient	Standard error	*t*	*p*	95% CI	
Age	0.11	0.28	0.37	0.71	-0.46	0.67
Gender (female)	4.66	1.48	3.14	0.002	1.74	7.59
Type of employment (temporary)	2.49	2.15	1.16	0.25	-1.74	6.72
Type of employment (nonofficial)	0.066	1.89	0.04	0.97	-3.64	3.78
Work experience	-0.12	0.29	-0.42	0.68	-0.71	0.46
Marital status (married)	-0.04	1.67	-0.02	0.98	-3.32	3.25
Fixed coefficient	112.19	7.27	15.43	0	97.89	126.49

stress caused by work activities. The lack of a significant relationship between the total stress score and the marital status might be attributed to the relatively small number of single participants in the study compared to their married counterparts.

A weak and nonsignificant negative correlation was observed between the total stress score and the age. However, Yousefi *et al.*[13] and Heydariyeh *et al.*[19] found that there was a significant difference between different age groups in terms of the mean score of occupational stress, which is not in line with the present study. The results of the study by Bahrami *et al.*[20] also revealed that demographic variables, such as age, affect the occupational stress and that young people are more exposed to stress, which can be due to the ability of the elderly to deal with stressful situations. It seems that increasing rate of age may be associated with increased experience, which could potentially contribute to reduced job stress.

According to the results, a weak and nonsignificant negative correlation was observed between the total stress score and work experience. In the study conducted in Qazvin, no significant relationship was found between the work experience and the intensity of the occupational stress, which turns up to be consistent with the current study.[17] Moreover, Phuke *et al.*[21] found a statistically significant relationship between the stress levels and years of experience where more experienced individuals showed higher stress levels. They argued that, despite the comprehensive clinical skills training provided in the nursing curricula, little emphasis is placed on stress reduction techniques. Of course, stress reduction techniques may create a work environment that fosters healthy interactions.

A significant relationship was seen between the role incompatibility and the employment type. The mean score of this field was higher for the temporary nurses, which could be due to the incompatibility of the work environment with their skills. Mahdizadeh *et al.*[22] reported that when nurses feel that the needs of their work environment are incompatible with their skills and education, they are less able to control and manage stressful situations. The situation then causes concern, frustration, and discouragement among the nurses.[23] As a limitation of the study, we should consider the possibility of conservative views among some participants.

Conclusion

Considering the high level of occupational stress among the nurses, it is necessary to develop a plan to reduce this stress. It is required to improve the quality of nurses' services by creating suitable working environment conditions and controlling and correcting the effective factors in creating occupational stress. It is also very important to pay attention to women due to their higher occupational stress.

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Conflicts of interest

Nothing to declare.

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