

# Evaluating the status of occupational stress and identifying its related risk factors among nurses in Babol City, Northern Iran: A cross-sectional study

SEYED EHSAN SAMAEE<sup>1</sup>, EBRAHIM TABAN<sup>2</sup>, SEYEDH SEDIGHEH SOLEIMANIAN<sup>3</sup>,  
MOHAMMAD HOSSEIN BEHESHTI<sup>4</sup>, OMRAN AHMADI<sup>4</sup>, MANDANA KALANTARI<sup>5</sup>,  
NADALI AKBARIAN<sup>5</sup>, MAHMOUD SADEGHI<sup>5</sup>, MINA GALESHI<sup>5\*</sup>

<sup>1</sup> *Mobility Impairment Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran;*

<sup>2</sup> *Department of Occupational Health Engineering, School of Public Health, Mashhad University of Medical Sciences, Mashhad, Iran;*

<sup>3</sup> *PhD Student of Educational Management, Babol Branch, Islamic Azad University, Babol, Iran;*

<sup>4</sup> *PhD Student of Occupational Health, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran;*

<sup>5</sup> *Clinical Research Development Center, Ayatollah Rohani Hospital, Babol University of Medical Sciences, Babol, Iran.*

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## ABSTRACT

The health of people is of great importance and stress is one of the factors affecting health. Stress affects people under different conditions and appears to be responsible for a significant number of illnesses and absenteeism among the workers of healthcare centers. The present study was performed to assess the occupational stress among the nurses working in the public hospitals of Babol City and identify the associated risk factors. This cross-sectional, descriptive-analytical study was conducted from October 2016 to April 2017 in the hospitals affiliated to Babol University of Medical Sciences (6 hospitals). A total number of 406 nurses working in the hospitals were selected by the simple random sampling method. The Occupational Stress Questionnaire-HSE was used to assess the nurses' stress and the demographic data of the participants were collected by a researcher-made form. According to the results, the lowest and highest scores were related to the communication ( $9.8 \pm 3.3$ ) and demand ( $23.1 \pm 5.1$ ) subscales, respectively. Based on the regression model, among the independent variables studied, only the variables of gender, weekly working hours, employment status, shift work system, and education level could predict the nurses' occupational stress.

**KEYWORDS:** *Health, Occupational stress, Nurse, Risk factors*

## INTRODUCTION

The people's health is of great importance and stress is one of the factors affecting health [1]. Stress is a common disease of the 21<sup>st</sup> Century, which affects humans under different conditions. It appears to be responsible for 30% of the illnesses and absence from work among the workers of healthcare centers [2]. Although anxiety and worry vary in different jobs, however some occupations, such as nursing are more stressful [3]. Studies have shown that 4.7% of nurses are absent from work per week due to stress-induced inability, which is 80% more than other professional groups [4, 5].

*Corresponding author: Mina Galeshi*  
*Email: [galeshi\\_m@yahoo.com](mailto:galeshi_m@yahoo.com)*

Amsterdam's National Institute for Occupational Safety and Health defines occupational stress as harmful emotional and physical responses, which occur if the occupational needs are not in coordination with the worker's capabilities, resources or needs [6]. Factors leading to occupational stress can be divided into two groups of individual-dependent and environment-dependent factors. Some stressors in work environments include "duty or job requirements" (such as workload, lack of task control, and ambiguity in duty), "organizational factors" (such as poor interpersonal communications and inappropriate managerial behaviors), "economic and financial issues", "contradiction between work

and family roles and responsibilities”, “aspects of career and education development (lack of opportunities for growth and promotion)”, and poor organizational atmosphere (manager's non-commitment to valuable forces, complex organizational communications, etc.) [7]. Important individual-dependent factors include character type, individuals' socioeconomic status, as well as demographic factors, such as age, gender, and marital status [8]. Studies have shown that constant dealing with patients, the responsibility of taking care of patients, conducting clinical processes, dealing with dying patients, facing emergency conditions, and shift work are among the stressors of the nursing profession. In addition, increasing demand for healthcare services, new medical diagnoses and therapies, and increased expectations of patients and their relatives are among the major changes in nursing job, which can reduce the quality of care for patients and cause occupational stress, job fatigue, and delay and absenteeism of nurses [9, 10]. In a study by Tyson and Pongruengphant, the major stressors for nurses were listed as workload, dealing with death and life situations, and performing tasks beyond capacity and ability. In a study by Sveindottir et al., the main sources of stress were reported as high workload, inadequate consultation and communication, inadequate feedback from performance, inadequate work sources, and work-life interference [11, 12]. The study of occupational stress and its consequences is very important from the perspective of industry and organization psychology. The first is concerned with the impact of occupational stress on individuals' quality of life, including a sense of satisfaction with life, physical, mental, and social health and deals with the emotional aspects of occupational stress. The second concerns with the wide-ranging outcomes that occupational stress creates in organizations and working environments [13].

Given the significant contribution of nurses to the healthcare structure and vulnerability of this occupation group to work-related factors, attention to the phenomenon of occupational stresses and the recognition of its related factors appear to be crucially important. In this regard, the present study was performed to assess occupational stress among the nurses working in the public hospitals of Babol City and identify its associated risk factors.

## MATERIALS AND METHODS

**Study design:** This cross-sectional, descriptive-analytical study was performed in the hospitals affiliated to Babol University of Medical Sciences (6 hospitals) from October 2016 to April 2017. The statistical population of this study included all nurses working in these hospitals during the mentioned period. The criteria for participating in the study included “having a bachelor's degree in nursing”, “having a full-time job”, “no mental and physical problems (according

to self-reports) and at least one year of experience in hospital wards. The exclusion criteria were the unwillingness to continue cooperating and incomplete answers to the questionnaires by the participants. The sample size was calculated to be 385 subjects by taking into account the occupational stress ratio ( $p = 0.5$ ) among nurses, type I error of 5%, and the confidence coefficient of 95% and based on the following equation:

$$n = \frac{z^2 p(1-p)}{d^2} = \left( \frac{(1.96)(0.5)}{0.05} \right)^2 = 385 \quad (1)$$

To ensure the minimum sample size, 406 nurses working in the hospitals were selected by the simple random sampling method. They were included in the study considering the proportion of the nurses in each hospital and the inclusion and exclusion criteria.

### Data collection tool:

A) Demographic and organizational information: A researcher-made form was used to collect the participants' demographic and organizational information, including gender, age, work experience, marital status, average weekly working hours, working ward, employment status, having a second job, type of work system, and education level.

B) Occupational Stress Questionnaire-HSE: The standard occupational stress questionnaire developed by the Britain Health and Safety Executive (HSE), consists of 35 questions and 7 subscales, including “demand (containing the topics, such as workload, features, and work environment)”, “control (i.e., how much the person is on the path to do his duties)”, “support from authorities (the amount of support a person receives from the management)”, “support from colleagues (the amount of support someone receives from his/her colleagues)”, “communications (enhancing positive traits to increase social connections and reduce workplace conflicts), role (proper understanding of the role of personnel in their organization)”, and changes (organization and its labor force). It also includes the 5-option Likert scale (never, rarely, sometimes, often, and always). The validity of the questionnaire has been examined by numerous international and domestic studies and their results suggest good validity of the questionnaire [14-16].

**Ethical considerations:** After obtaining the letter of permission from Babol University of Medical Sciences (Code of Ethics: MUBABOL, HRI REC 1395.254), the researchers referred to the hospitals under study during different shifts and days of the week (for more access to the nurses). After describing the objectives of the study to the participants, clarifying their rights, and taking their oral consent, they were given enough to fill out the questionnaires and deliver them to the researchers.

**Statistical analysis:** The mean and standard deviation indices were used to describe the variables in this study. The logistic regression model (Backward: LR) was also used to analyze and predict the individual-organizational factors affecting the participants' occupational stress. The level of significance in the statistical tests was considered to be as  $P < 0.05$ .

## RESULT

According to the results, 86.7% of the nurses (352) were female, and the age group of 30-39 was most frequent among them (58.6%). The nurses working in the inpatient wards comprised 36% of the participants (Table 1). According to the results from the analysis of the HSE questionnaire, the lowest and highest scores were related to the subscales of communication ( $9.8 \pm 3.3$ ) and

demand ( $23.1 \pm 5.1$ ), respectively. Based on the Pearson correlation coefficient, there was a significant positive correlation between all subscales of the questionnaire except for communication, which negatively correlated with the other subscales. The internal consistency of the 7 subscales and 35 questions of the HSE questionnaire were estimated to be within the range of 0.60-0.75. Among the subscales, demand and control obtained the highest and lowest level of Cronbach alpha, respectively (Table 2).

Based on the regression model, among the independent variables, only the variables of gender, weekly working hours, employment status, shift work system, and education level remained significant in the model. In better words, these variables were able to predict the occupational stress of the nurses (Table 3).

**Table 1** Employees' Demographic and occupational characteristics in the population under study

Variable	Category	Total	%
Gender	Female	352	86.7
	Male	54	13.3
Age (year)	20-29	92	22.7
	30-39	238	58.6
	$\geq 40$	76	18.7
Clinical experience (year)	$5 \geq$	107	26.4
	5-10	205	50.5
	$> 10$	94	23.2
Marital status	Married	302	74.4
	Unmarried	104	25.6
working hours per week (h)	$\leq 44$	308	75.9
	$> 44$	98	24.1
Ward	Emergency ward	21	5.2
	Critical care unit	84	20.7
	General ward	146	36
	Surgery ward	80	19.7
	Operating room	75	18.5
Employment status	Permanent	152	37.4
	Contractual	254	62.6
Secondary job	No	357	87.9
	Yes	49	12.1
Shift work	Fixed duty	79	19.5
	Shift duty	327	80.5
Educational level	BSN*	375	92.4
	MSN/PhD**	31	7.6

\* Bachelor of Science in Nursing

\*\* Master of Science in Nursing/ Doctor of Philosophy in Nursing

**Table 2.** Internal consistency and mean and standard deviation of the items in the HSE questionnaire (n=406)

Items	1	2	3	4	5	6	7	Total	M (SD)	$\alpha$
1	-								23.1(5.1)	0.75
2	0.288*	-							18.8(3.8)	0.60
3	0.277*	0.385*	-						18.2(3.5)	0.70
4	0.308*	0.341*	0.630*	-					14.8(2.7)	0.74
5	-0.529*	-0.165*	-0.390*	-0.440*	-				9.8(3.3)	0.72
6	0.141*	0.178*	0.3248	0.210*	-0.220*	-			21.3(2.8)	0.71
7	0.239*	0.481*	0.674*	0.476*	-0.287*	0.231*	-		10.2(2.3)	0.61
Total	0.593*	0.705*	0.766*	0.664*	-0.319*	0.464*	0.721*	-	116.4(12.2)	0.77

1= Demand, 2=Control, 3=Supervisor Support, 4= Peer Support, 5= Relationships, 6= Role, 7= Change,

\*\*Correlation is significant at the level of 0.05 (2-tailed)

**Table 3.** Predicting factors of the logistic regression model developed for the assessment of occupational stress among the nurses in Babol City in 2017 (n=406)

Variables	Occupational Stress		OR	95%CI (L-U)	P-value*	
	Yes	No				
<b>Gender</b>	Male	37(9.1)	17(4.2)	--	--	0.019
	Female	198(48.8)	163(37.9)	2.328	1.026-7.235	
<b>Weekly hours of work (h)</b>	≤44	197(48.5)	111(27.3)	--	--	0.009
	>44	72(17.7)	26(6.4)	3.265	1.478-11.212	
<b>Employment status</b>	Permanent	88 (21.7)	64(15.8)	--	--	0.035
	Contractual	135(33.3)	119(29.3)	1.372	1.026-3.894	
<b>Shift work</b>	Fixed shift	42(10.3)	37(9.1)	--	--	0.006
	Rotational shift	203(50)	124(30.5)	4.213	1.0981-9.697	
<b>Education level</b>	BSN*	192(47.3)	183(45.1)	--	--	0.031
	MSN/PhD**	11(2.4)	20(4.9)	0.549	0.167-0.921	

\*The significance level was considered to be as  $P < 0.05$

## DISCUSSION

Based on the results from the assessment of nurses' occupational stress, the demand subscale had the highest score among the different subscales of the HSE questionnaire. All expectations and aspirations of a nurse in job affairs, including those from colleagues, supervisors, organizations, and visitors (patients) are recognized as job demands [17, 18]. According to the Karasek theory, the job demand is one of the important components that need to be considered in the design of jobs. Whenever the job demand is high and the ability to make decisions and time to apply control over the work for doing it is low, then, the job will be a source of stress [19, 20]. Increasing job demands in nurses will impose psychological pressures on this job group, which continuation will lead to the emergence of psychological and physical disturbances among them. In other words, occupational stress is the result of the mismatch between the existing work demands and the resources that satisfy them [21].

**Relationship between gender and occupational stress:** According to the results of the regression model, there was a significant relationship between job stress and gender, so that the probability of job stress in female nurses was 2.32 times higher than the males. The results of a study by Yada et al. on nurses in Japan are consistent with the present study, in which, it was shown that women have higher occupational stress than men [22]. In addition, in a study by Hosseini et al. on nurses in Hamadan, it was found that there is a significant relationship between gender and occupational stress, implying a higher stress rate in female nurses than the males [23]. These results were also consistent with the present study. In addition, it can be suggested that in addition to performing duties in the hospital, female nurses are obliged to take care of their personal and family affairs for the rest of their working days. These work-related stresses and fatigue can interfere with their work and even in emotional behaviors with family members, which in turn reduces their quality

of life and their willingness to do their daily routines, such as exercise or other health-related activities. It should also be noted that chronic exposure to these conditions and the accumulation of occupational and family risk factors in female nurses play a crucial role in developing occupational stress in this vulnerable group [8, 24].

**Relationship between work hours and occupational stress:** In this study, the increased working hours of the nurses during the week was reported as a predictive variable in the development of occupational stress in this group. Thus, with the increase in working hours from 44 hours per week, the chances of job stress in these nurses are 3.26 times higher than those who work fewer hours per week. This finding is consistent with the results of the study by Willy et al. They reported increased working hours as one of the most important risk factors of mental disorders and stresses [25]. Udod also found a positive relationship between overtime hours and stress [26], which confirms the results of this study. Increased hours of work and mandatory and overtime work make nurses unable to take adequate rest and care for other aspects of their life. In addition, continuous activity during the holidays can lead to fatigue and drowsiness in nurses, resulting in burnout and reduced safety of patients [27, 28]. Increasing working hours increases the conflict between job and family responsibilities, which can lead to occupational stress. Most importantly, the stress in the nursing profession is associated with a qualitative and quantitative decline in health care services and this will have adverse effects on community health [28].

Accordingly, identifying nurses' stress levels and control of stress in their workplace may lead to measures for the mitigation of its complications, such as reduced quality of work.

**Relationship between employment status and occupational stress:** According to the regression model, the nurses' employment status was recognized as another predictor for occupational stress. The chance of occupational

stress in contractual nurses is 1.37 times higher than that of the official nurses. Nasiry et al. conducted a study on 940 nurses with the aim of assessing their quality of life and its relationship with occupational stress. The study found that the level of occupational stress in contractual nurses was higher than that of the official nurses. The reason may be due to uncertainty about job prospects, lower salary and benefits, fear of unemployment, and job change compared to the official nurses [29].

**Relationship between work system and occupational stress:** A significant relationship was found between the incidence of nurses' occupational stress and the types of work system in the present study so that the chance of developing occupational stress in the nurses with working shifts was about 4.4 times more than the nurses with fixed working shifts.

In a study by Mortaghy et al. on 155 nurses in Zanjan Province, no significant relationship was observed between work shift and occupational stress [30]. However, Cavalheiro et al. found a significant relationship between intermittent working shift and night shift with stress among the nurses in the Intensive Care Unit [31]. Hsu et al. reported the same about the nurses in Taiwan [32]. In addition, in a study by Khaghani-zadeh et al. on the nurses working in the selected hospitals of the armed forces, the work shift was reported as one of the effective factors in the incidence of stress among the staff [33]. Working in unusual shifts is one of the factors accelerating job burnout due to increased mental burdens, increased job demand, creation of contradictions, and increased occupational stress. Variable shift jobs disrupt the rhythm of the biological clock (circadian cycle) and cause physiological outcomes, including increased prevalence of digestive problems, sleep changes, persistent fatigue, cardiovascular problems, and behavioral changes such as reduced efficiency and irritability [34-35].

Nursing is among the jobs involved in the working shift. Therefore, providing an opportunity to relax between shifts and reducing working hours, especially at night and evening shifts, as well as giving breaks before and after the shift will help to reduce stress among the shift-working nurses.

**Relationship between education level and occupational stress:** Based on the regression model, a significant relationship was found between education level and occupational stress. The chance of occupational stress in the nurses with the education level beyond the bachelor's degree was 54.9% lower than those with a bachelor's degree. The results of the study by

Heidari et al. in Qom Province were in line with the present study [36]. According to the research, people with higher education levels had lower than average stress levels. This can be due to their greater awareness of the workplace and the duties they perform in the workplace [37].

The low prevalence of occupational stress factors in people with high education levels may be because of job security for these people and employment of the majority of this group in jobs with low mental and physical needs as well as receiving more rewards than the other nurses. They might have already received more training to cope with stressful occupational conditions and evaluate the same occupational stressors milder. This requires identifying vulnerable groups and focusing intervention measures on these groups.

**Limitations:** One limitation of this study was the use of a self-reporting questionnaire to collect data, whereas the psycho-emotional conditions of the individuals when completing the questionnaire are one of the determinants of how the questionnaires are answered. In addition, the variables examined in this study were designed based on the researchers' assessment, while there are other variables affecting nurses' occupational stress, which can be used in future studies.

## CONCLUSION

Based on the regression model, among the variables examined in the present study, the variables of gender, average weekly working hours, employment status, work system, and education level have the ability to predict the incidence of occupational stress in the studied nurses. In this regard, if the sources of occupational stress are not properly identified and controlled, nurses' health will be affected by physical, psychological, and psychological problems.

Since healthy and motivated nurses are vital for any healthcare systems, and because of the inevitability of some stressors in the nursing profession and the need to avoid the psychological and behavioral effects of stress, effective control and educational measures seem necessary to improve nurses' occupational stress and the quality of life.

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