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## The effect of using of Ergonomics Knowledge in Preventing Occupational Hazards of Medical Emergency Personnel, and Nurses Working in Intensive Care Units in Teaching Hospitals of Hamedan.

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### ABSTRACT

Musculoskeletal problems are the major source of morbidity, disability and related costs, so it is important to pay attention to this important and knowledge of this important study called ergonomics. The aim of this study was to investigate the application of ergonomics in the prevention of occupational hazards of emergency medicine personnel and nurses working in intensive care units in the teaching hospitals of Hamedan. In this cross-sectional study, Nordic standardized questionnaire of all emergency personnel, doctors and nurses in Hamadan intensive care unit were distributed. The collected data were analyzed using SPSS version 16 were used to compare the frequency of occupational injuries inferential statistics and chi-square test and Fisher's exact test was used. The difference between the two groups in terms of emergency medicine personnel and nurses were familiar with the principles of ergonomics ( $p = 0.012$ ). There was no significant relationship between the number of accidents and ergonomics knowledge. No significant relationship was found between nurses and emergency medicine personnel and knowledge of ergonomics. Increased ergonomics and application of knowledge of health care workers have an important role in reducing the incidence and occupational injuries and the inclusion of this knowledge in specific subjects curriculum medical personnel can impose heavy costs on the treatment system, fatigue and bodily harm medical personnel prevented.

**Keywords:** Occupational injuries, ergonomics, health personnel.

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## INTRODUCTION

Due to the nature of the employment of personnel and healthcare workers caring for patients as well as work at different hours of the day and especially night work shifts jobs than any other occupational hazards will be involved (1). The common occupational injuries can be injuries, fractures and dislocations and sprains, burns types, types of amputations and named poisoning (2). The main source of pathogenic musculoskeletal problems, disability and related costs, so it is important to pay attention to this important and the science of ergonomics to consider this issue (3). In other words ergonomics is the science of modification and optimization of the environment, jobs and equipment in a manner that is consistent with human limitations and capabilities (4). The application of ergonomics principles, including consideration of many factors that affect how people react effectively to the environment include the following: Its spatial distance between equipment and personnel movements in the environment, health and the status of the worker's body size, type and number of moves required to perform the task, hand tools and methods used for the application environment, including temperature and lighting conditions (5). Among the injuries and conditions that threaten the health workforce are some of the diseases are work-related diseases and one of the most important work-related musculoskeletal side effects can be noted and the complication generally occurs when the job requirements exceed the capabilities of the individual. So with the help of the principles of ergonomics can be found through reducing muscle activity and control mechanical factors significantly reduce the incidence of these disorders (6). Risk factors for musculoskeletal injuries, including acts of excessive force, awkward postures, contact stress, individual factors, psychosocial factors and lack of mobility.

The risk factors associated with poor posture can be a deviation of the wrist, spine curvature and rotation of mention. The risk factors associated with individual factors include poor physical fitness, excessive weight, poor nutrition, lifestyle false name. The risk factors associated with psychosocial factors such as job stress, job insecurity and lack of support from colleagues involved (7). In recent years, the industrialization of countries, the work-related accidents and injuries is increasing (8). But the failure to apply the correct principles of ergonomics in the workplace increases the damage increasing the staff and consequently huge costs on health care systems, this study aimed to evaluate the application of the principles of ergonomics in the prevention of occupational hazards emergency medicine personnel and nurses working in intensive care units teaching hospitals of Hamadan.

## MATERIALS AND METHODS

This study was a cross-sectional study and the study population included all emergency personnel, doctors and nurses working in intensive care units in teaching hospitals of Hamedan. Sampling for census and include all health care workers and nurses working in ICUs of Hamadan (Besat, Farshchian, Ekbatan and Shahid Beheshti hospitals) that they are willing to participate in this study. Inclusion criteria included having at least one years' experience in the unit, lack of chronic diseases and musculoskeletal injuries due to lack of factors outside of the workplace. Exclusion criteria included having a physical disability, the following year relevant work experience and employment in the same job to another job or jobs in other medical centers. The instrument used in this study included demographic information including age, gender, check list, education, work history, medical history of working hours as well as a Nordic standard questionnaire the research is used both inside and outside (9). To determine the symptoms of musculoskeletal disorders Nordic questionnaire will be used. The questionnaire consists of two parts: general and specific. The public part of the overall review of the whole body in which symptoms arise but in the questionnaire dedicated to the analysis of signals generated in different areas of the body such as the hands, waist and deals. The questionnaire body movement system into 9 areas, including the neck, shoulders, elbows, wrists / hands, waist, hips / thighs, knees and ankles / legs split and using questions, history of pain in these areas is examined. This questionnaire can be used in epidemiologic surveys in musculoskeletal disorders, but it cannot be used for clinical diagnosis (10). In an Iranian study in 1394 by Mokhtarinia et al as localization, validity and reproducibility NMQ, Intraclass correlation coefficient and SEM Persian version questionnaire developed by Nordic at an acceptable level)  $ICC > 0.70$ ,  $(SEM = 0.56-1.76)$ , respectively. Kappa coefficient ranges between  $1 - 0.78$  respectively (11). The second questionnaire to assess the knowledge of nurses and technicians, emergency medical ergonomically designed. This questionnaire was developed by comments and suggestions on the design of undergraduate and graduate health professionals have been helping. The questionnaire consisted of 15 questions designed to either of these questions is considered a score. Scores of 0 to 5 as poor knowledge of ergonomics, 6 to 10 average score of 11 to 15 will be considered as a good knowledge of ergonomics. And

then adjusted data sheet and enjoying the professors of the Faculty of Medical Sciences ergonomics, it was necessary reforms. Using test-retest reliability of the ergonomics as well as review and vary from 850 correlation coefficient was calculated.

Researcher after approval, presenting an introduction letter from the Department of Emergency Medicine management referred hospitals and after coordination with respected managers in different shifts in teaching hospitals of Hamadan medical intensive care units. The aim of this study was to describe and respectful staff and then from the staff working in these units received written consent to participate in research and the questionnaire available to all personnel who gave their willingness to participate in research. If you require those questions were answered and also to avoid the bias of the subjects will be asked to complete the questionnaire at the right time so that fatigue and excitement in the minimum possible, complete. After data collection to analysis, descriptive and inferential statistical methods were used. The analysis of demographic data, descriptive statistics (such as the relative frequency and average) is used to compare occupational injuries and inferential statistics and chi-square test and Fisher's exact test was used by software SPSS version 16. Ethical considerations, including obtaining permission from the Ethics Committee of the Hamedan University of Medical Sciences, receiving a written notice from the School of Nursing and Midwifery University of Medical Sciences to be presented to the management of the hospitals, informed consent to participate in research units research and ensure the confidentiality of the information received was fully met.

**Findings:**

81.7 percent of the participants were between 20 and 40 years old and 59.2 percent were female. 3.80% of the participants were bachelor and 94 people in the intensive care unit nurses. 71.4 percent were under 10 years of work experience and 8.6 per cent claimed that they were not familiar at all with the principles of ergonomics and 46.3 percent claimed that they were familiar with the principles of ergonomics. 51 percent had a normal body mass and 61.2 percent have claimed that sports activities throughout the week. 64.6 percent stated that between 200 and 250 hours a month in the current post and just work on the same job.

**Table 1) the relationship between the number of accidents and ergonomics knowledge in the subjects**

	Gamma correlation coefficient	Test	p-value
The number of accidents knowledge of ergonomics	-0/125	0/358	0/265

In Table 1 given that the coefficient is negative gamma it becomes clear that the relationship between the number of accidents and knowledge of ergonomics are photos and this means that with an increasing number of accidents is lower ergonomics. But given that the p-value is greater than 0.05 is obvious that this relationship is not significant.

**Table 2) the relationship between occupation and ergonomics in subjects**

Ergonomics		Emergency medical staff	Nurses	Total	P-value
Have	frequensi	31	37	68	0/012
	% Of column	58/5	39/4	97/9	
does not have	frequensi	0	10	10	
	% Of column	0	10/6	10/6	
Rather	frequensi	22	47	69	
	% Of column	41/5	50	91/5	
Total	frequensi	53	94	147	
	% Of column	36/1	63/9	100	

As was seen in Table 2 under chi-square test emergency personnel are more familiar with the principles of ergonomics and a p-value less than 0.05 emergency medical and nursing staff indicate significant differences between the two groups in terms of ergonomics principles is familiar.

**Table 3) the relationship between occupation and ergonomics knowledge in the subjects**

Ergonomics		Emergency medical staff	Nurses	Total	P-value
Weak	frequensi	15	25	40	0/185
	% Of column	28/3	26/6	54/9	
Moderate	frequensi	38	63	101	
	% Of column	1/7	67	68/7	
good	frequensi	0	6	6	
	% Of column	0	6/4	6/4	
Total	frequensi	53	94	147	
	% Of column	36/1	63/9	100	

In Table 3, according to Fisher's exact test were both fair and poor ergonomics information and significant correlation was observed between the two groups and ergonomics knowledge.

**DISCUSSION**

Results showed that emergency personnel are more familiar with the principles of ergonomics and the findings indicate significant differences between the two groups in terms of emergency medical and nursing familiarity with the ergonomics principles but the frequency and type of damage in the results showed that despite the emergency medicine personnel more familiar with the principles of ergonomics as part of the course curriculum is taught and in this lesson will be explained to them how to correct patient, the more damage and injuries in emergency medicine the findings of the research were consistent with results of Chubineh (12), Aghlinezhad (13) and Maguire et al (14) but with findings Salem (15) and Mahmoodi et al (16) did not match that can be attributed due to the type of population study for their research in the public sphere and not in intensive care nursing is sometimes needed nurses take action to change the positioning of the patients was performed. Ergonomics knowledge between the two groups in emergency medicine personnel and critical care nurses, the results showed that both groups had moderate and poor ergonomics information and there is no meaningful relationship between the two groups and ergonomics knowledge and the study Sharifnia (17) and Khoshbakht et al (18). The relationship between the number of accidents and knowledge of ergonomics showed that the correlation between the number of accidents and knowledge of ergonomics are photos and this means that with an increasing number of accidents is lower but it became clear ergonomics that this is not a meaningful relationship with findings from Mossadegh Rad (19), Sharifnia (17) and Khoshbakht et al (18) consistent but the study Azizpour et al (20) does not match that of the population studied and sample size of this study is different and this discrepancy may be attributed to two reasons.

**CONCLUSION**

Ways to prevent work-related problems in many studies as teaching body mechanics, changes in body position ergonomic work environment and proper education are doing the methods that can be used to enhance health care personnel, avoid skin lesions and skeletal disorders and impose heavy costs on health systems and medical staff to prevent burnout. So it is recommended strategies for preventing injury and damage from jobs on the job training and the frequency of the program is training nurses and medical emergency. Based on these results, it is suggested topic areas related to prevention strategies of occupational injuries in training programs and administrative staff of the Ministry of Health and Master courses included training in specialized subjects Koriklom before the presence of personnel in the workplace as a personnel aware of the risks and ways to deal with it.

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