

Research Article

To investigate the relationship between knowledge of ergonomics and occupational injuries employee job at operation rooms of Hamedan University of Medical Science.

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ABSTRACT:

Introduction and purpose: The more human attention to human factors is undoubtedly the most important principles and standards of an organization because for all organizations, both large and small, are meaningless and void without the use of human resources taking ergonomics not only protect the health of efficient manpower it will be prevents the creation of many additional costs too .The aim of this study is to investigate the relationship between knowledge of ergonomics and occupational injuries in the operation room staff.

study method: This study is cross-sectional and descriptive on 163 employees operating rooms Hamadan University of Medical Sciences .The data collection instrument was a standard questionnaire that determined the stability and validity. The questionnaire consisted of five parts: demographic information, Assessment of knowledge, working conditions, work problems, and occupational injuries has been collected. In order to analyze data from SPSS statistical software (version 16) and in part of descriptive statistics used of the average, minimum, maximum, variance, Standard deviation, tables and various charts and also used of the statistics to analyze data to answer questions and research hypotheses for normally distributed variables used of statistical test the kolmogorov-smirnov to investigate the relationship between variables, according to the data distribution (normal or not) from statistical test the Pearson or Spearman correlation coefficient.

Findings: Knowledge of operating room staff in the field of ergonomics with a mean of $65/0 \pm 96/2$ 5 reported weak. the operating room staff's working conditions is assessed (in terms of workplace lighting. Ventilation. Heating. Cooling. Quietness. Equipment. Workplace .protective equipment, etc.) and an average total 1/79 of 5 points very weak 79/1 and 38/2 of problems with work and occupational injuries with an average total of 5 points as weak. There is a significant relationship between occupational injuries and the operating room staff awareness of ergonomics given that the correlation coefficient between two variables is negative there is negative significant relationship it means that with increased levels of one, others decreases.

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Conclusion: Because the amount of the staff awareness in the field of ergonomics assessed too weak seems to apply the safety rules and standard conditions for workplace So professional health education can be regarded as one of the operational objectives for operating room staff to be done as during the work.

Key words: ergonomics, working conditions and problems, the operating room staff.

INTRODUCTION:

Investment to create suitable, healthy, loving and safe working environment makes the worker or employee works with more morale, motivation, confidence and thus increase work efficiency. It also creates a healthy and safe working environment to prevent accidents and damages and in note it reduces of different costs directly or indirectly accidents.¹ Any neglect to the staff in the operating room leads to a reduction in the quality of services provided to the community. So the standard conditions for workplace could lead to reduction of job pressures. Unfortunately, the traditional attitude of management Is very inadequate to respond to issues such as workplace design, protection of labor, improve efficiency and labor productivity, reduce energy consumption, increase speed and accuracy, and safety and reduce occupational accidents, in a competitive and global market. And its necessary mangers in today's organizations have a general revision in these matters and to appreciate the ergonomics than ever before. Measures such as job matching workers according to personal differences, improve the way of job performance ,standard time that provide employment expectations ,recognizing the potentials and limitations of the workforce, identify and control workplace physical factors, identify and answering to the demands of consumers with regard to their physical and psychological limitations and requirements. All efforts ultimately will follow higher productivity and greater convenience workforce and wider consumer acceptance. (2) ergonomics is the science of improvement work environment, job and equipment and adapting them to the capabilities and limitations of human beings. Using ergonomic approach and education

in this field In any organization plays an important role in the operational management of the organization Failure to these considerations lead to a drop in motivation and efficiency of human resources, increases the amount of displacement and staff absenteeism and ultimately reduce the effectiveness, efficiency and productivity of the organization.³ its necessary mangers in today's organizations have a general revision in these matters and to appreciate the ergonomics than ever before. This study investigates the relationship between awareness of ergonomics knowledge and occupational injuries to employees operating room in addition to determine the level of staff knowledge of ergonomics specify their occupational injuries. Managers will be able to educational programs and adequate safety equipment and totally use ergonomics effects in their plan.

METHODS

This cross-sectional and descriptive study to assess the working conditions of operating room staff to determine working problems and their occupational injuries and their Awareness of practical ergonomics knowledge in 1393 it done in operating rooms in hospitals of Hamadan University of Medical Sciences.The study was done with census method ,163 employees operating rooms of Hamedan University of Medical Sciences were studied.

The study population consisted of 163 employees of operating rooms Hamedan University of Medical Sciences.

In this study, after receiving permission from the Research Council and the consent of the authorities, hospitals and the operation rooms and get written consent from employees who were

willing to participate in the study, then was examined the awareness and attitude of the staff in phases of operating room in connection with awareness of ergonomics science and occupational injury. Parts of the operating room in didactic and Therapeutic centers consisted of hospitals, Besat, farshchian, Fatemiyeh, Ekbatan and Shahid Beheshti hospital that located in Hamedan, The questionnaire that designed before and Nordic standard that its stability and validity has already been done by the necessary number of researchers Were distributed in every unit that had been performed briefing to them before. The questionnaires by experts from each unit were distributed and under fully supervision collected and for analysis delivered to statistical consultant. The questionnaire included questions about personal information, assessment knowledge about ergonomics, working conditions, work problems and occupational injuries. Questionnaires were analyzed after answering the operating room staff to the questions, and the score was calculated for each questionnaire. The questionnaire has 63 questions that were by pre-determined experts give to extract and enter the software spss16 That all these steps was under the supervision of Statistics consult and finally analysis was done. In addition, at all stages of filling the questionnaire which lasted about 6 months the Executive has complete supervision. Inclusion criteria is consist of: The staff in the operating room, that have the willingness to cooperate in the study and they were employee in the operating room at the time also exclusion criteria consist of: Less than a year working experience, birth defects or accidents which occurred outside the work environment and Mandatory sick leave, such as maternity, If there are conditions to log in study after obtaining written consent and complete a demographic questionnaire, these employees were asked to fill in questionnaire assessed awareness in side of researcher. The mentioned questionnaire consists of five sections: The first part of the questionnaire

containing demographic information such as age. Sex. Marital status, educational status and work experience and type of employment and the second part contains 13 questions according to Likert scale in order to measure awareness about ergonomics. The third part questionnaire containing 16 closed questions in Likert scale and five open questions to determine the occupational injuries of operating room staff in the past year. And Part V questionnaire contains three free questions have already been confirmed stability and validity in previous research.⁴ Answering of questions in the second third and fourth section. questionnaires were rate to classify the operating room staff awareness of ergonomics. working conditions and occupational injures the obtained score have been grouped. (Less than 2 very poor. 2 to 2/75 weak 2/76 to 3/5 average. 3/51 to 4/25 and 4/26 to 5 very good)⁵. Data were analyzed by using spss software in qualitative data is used of to calculate the average and standard deviation and in quantitative data is used of calculation of absolute frequency and relative frequency. for normally distributed variables used of statistical test the kolmogorov-smirnov¹ to investigate the relationship between variables, according to the data distribution (normal or not) from statistical test the Pearson² or Spearman^{3,4} correlation coefficient. assuming an alpha error of 5%.

RESULTS

The study was done with census method, 163 employees operating rooms of Hamedan University of Medical Sciences were studied. The average and Standard deviation of employees age was Respectively 32 and 7/93 years. The average and standard deviation for the Variable work experience is reported Respectively 9 and 7/15 years,. 62/4 percent was female and 30.9 percent of them were male. 50/5 percent of people have bachelor and upper than it and others were graduate with less than bachelor. About employment, Respectively the percent of

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government employees 22/4%, official experiment 21/2%, contractual 17/6%, projective 13/3%, and other 24/8% have been reported.

Standard deviation	average	maximum	minimum	strength	Hospital
.460	3/08	4/15	2	24	Beheshti
0/85	3/09	3/85	0	21	Farshchian
.53	3	3/85	1/77	21	Ekbatan
.87	2/75	4/15	1/15	19	Fatemiyeh
0/58	2/93	4/77	0	80	Besat

Table 1: Distribution frequency of operating room staff awareness of ergonomics science

Standard deviation	average	maximum	minimum	strength	Hospital
.460	3/08	4/15	2	24	Beheshti
0/85	3/09	3/85	0	21	Farshchian
.53	3	3/85	1/77	21	Ekbatan
.87	2/75	4/15	1/15	19	Fatemiyeh
0/58	2/93	4/77	0	80	Besat

Table 2: Distribution frequency of operating room personnel problems with work and occupational injuries

¹Kolmogorov-Smirnov test

¹Pearson's correlation coefficients

¹Spearman's correlation coefficients

¹Kruskal-Wa

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Standard deviation	average	maximum	minimum	strength	Hospital
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Table 3: Distribution frequency of working conditions based on criteria of ergonomics in operating rooms

According to Table 3 finding ,average of working conditions specified in each of the hospitals and the highest average of observation ergonomic working conditions is about the staff Ekbatan's staff. Given that among of P is less than 0/05, $p = 0/004$,there is a significant relationship between two variables of awareness and occupational injuries. And correlation between two variables is negative, $r = - 0/224$ and with increasing among of awareness decreased the occupational injury rates. To examine the relationship between awareness of ergonomics science and sex, marital status and type of employment, coefficient correlation gamma and the relation between awareness of ergonomics science and Variables of age, educational level and work experience is used of Spearman coefficient correlation.

According to analysis by Levene test and independent t-test. Variances are not equal ($p = 0/002$) and assumption of average working

equality is rejected in both women and men and working problem in women is more than in men.

According to the analysis of results of testing Levene and independent t-test p value is more than 0/05, assuming equality of variance in both groups are available and the average of occupational injuries among both groups (single and married)are equal and occupational injuries is similar in the two groups of single and married. According to p among in Cramer correlation test is more than 0/05 therefore there is not significant relation between two variables, occupational injuries and type of employment.

To analyze the relationship between above variables was used of Pearson coefficient correlation.

According to the among of p is less than0/05 there is the significant relationship between two variables ,working conditions and occupational injuries. And given that the sign of correlation is

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negative between the two variables There is a significant negative relationship, meaning that with decreasing the Privacy of working conditions the occupational injuries increased.

Table 4: Determination the relationship between occupational injuries and demographic data in units associated with Hamedan University of Medical Sciences .

P. value	Statistic test	Working problems and occupational injuries	Variable level	variable
0,002	T 3,096	2/13 ± 0/60	male	sex
		2/53 ± 0/81	female	
0,593	F 0,773	2/56 ± 0/88	20-25	age
		2/48 ± 0/75	25-30	
		2/3 ± 0/80	30-35	
		2/19 ± 0/65	35-40	
		2/19 ± 0/65	40-45	
		2/33 ± 0/81	45-50	
0,002	F 3,739	2/11 ± 0/89	degree	educatio nal
		2/21 ± 0/69	diploma	
		2/27 ± 0/67	associate	
		2/65 ± 0/73	bachelor	
		1/56 ± 0/52	Master degree	
0,444	F 0,961	2/44 ± 0/83	Less than 5	Work experien ces
		2/55 ± 0/81	5-10	
		2/16 ± 0/77	10-15	
		2/33 ± 0/61	15-20	
		2/37 ± 0/63	20-25	
		2/15 ± 0/50	25-30	
0,438	F 0,970	2/383 ± 0/64	employed	Type of employ ment
		2/42 ± 0/81	Experimen tal official	
		2/56 ± 0/84	contractual	
		1/59 ± 0/18	corporativ e	
		2/38 ± 0/79	projective	
0,430	T 0,970	2/38 ± 0/60	single	Married status
		2/53 ± 0/81	married	
0,001	F 5,162	2/01 ± 0/77	Beheshti	hospital
		2/01 ± 0/77	Farshchian	
		2/45 ± 0/70	Ekbatan	
		2/95 ± 0/87	Fatemiyeh	
		2/29 ± 0/75	Besat	

DISCUSS:

Occupational injuries not only cause physical discomfort and spiritual, Emotional and socially for operating rooms staff the orgnization loses active worker too. And endure the high cost of treatment and missed opportunities .

It has been estimated that US companies and organizations endured1/2 trillion dollars because of own employee occupational injuries annual that this figure is equivalent to 14/3 percent of GDP this country .This losses consist of salary and unemployment wage , the cost of treatment ,the cost of days of hard work Short-term and long-term disabilities (21). According to the findings of this research knowledge2/96 ± 0/65 of 5 points is poor working conditions 2/38 ± 0/47of 5 points is weak problems with work and occupational injuries with average of 2/46 ± 0/73 of 5 point is week.

Evaluated the results of this study with the findings from the Mosadegh Rad that evaluated by him the rang of nurses' knowledge in the field of ergonomics with average of 2/68 ± 0/76 of 5points is week and working conditions, with average of 2/13 ± 0/67 of 5 point is week and among of the working problems and occupational injuries with an average of 2/46 ± 0/73 of 5 points is week are consistent. In the investigation of the muscular-skeletal problems in the Research Community, neck problems 36/2 percent, 32.4 percent shoulder problems and 61 percent waist problems and 34.3 percent Wrist were raisted. That included the highest percentage of back problems,that in the same article was (13) 63/9 percent in the back. 21/6 of the neck. 8/1 percent of the wrist andDehghan Menshadi (14) 59/5% of neck pain, 54/5% of back pain, Shoulder pain41/4% wrist pain 4.38% in this study and the Mosaddeq Rad and Dehghan Manshadi studies the most muscular-skeletal problems was in the back and neck that Mostly is due to standing activities for moving and relocation patients ,bending to do work, absence enough knowledge ,the Lack of health and safety and absence operation of

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equipments, and also his careless. In Similar studies have been also discontent of back and neck are more than other body parts. Increasing daily working hours is associated with prevalence of muscular-skeletal disorders (22)

There was a significant relationship between gender and occupational injury rates ($p = 0.001$) that in the similar study (5), there was this relationship too. And in the majority of studies the sign of these disorders in women is more common than men. (24 and 23) between the rang of awareness of ergonomics and age there is not significant relationship ($p > 0.05$) between the awareness of ergonomics and academic level there was not significant ($p > 0.05$) between the awareness of ergonomics and occupational injuries there is significant relationship. ($p < 0.05$) that decreased with increasing amounts of one another.

The findings of this study show The operating room staff the rang of awareness about ergonomics is weak that There is no doubt that the lack of sufficient knowledge in this area is one of reasons for occupational injuries staff, lack of enough protective equipment is one of the other occupational injuries. With these results we can say that ergonomics is improvement science of the working environment, job and equipment and adapting them to the capabilities and limitations of human beings .Without doubt using ergonomic approach is an important role in the management of any organization.

Failure to performance of these considerations lead to reduced motivation and efficiency of human resources, increases the amount of movement of workers absenteeism and finally reduce the effectiveness and efficiency of the organization

Final result:

The results of this study and the low knowledge level of operating rooms staff about ergonomics ,one of the most important ways attention to human and quality of his Proper and premier functioning is awareness of ergonomics principles

and its usage of those principles in the design of work posts Including training of staff in the correct way work , using standard equipment - efficient use of available Facilities and the importance of rest breaks during long time work and education about daily exercising due to body health in the field of prevention of occupational injuries can be have Important role in reducing occupational injuries - Increase employee productivity and to have refresh and mighty workforce from different parts remedial managers should be asked to pay more attention to workplace in terms of ergonomic standards and regular training programs about workplace ergonomic considerations To target health Protection and prevention of disorders and their efficacy is necessary.

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