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Investigating the Effect of ergonomic factors on stress and job satisfaction of employees in health care section of Rasht

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ABSTRACT: Ergonomics studies the human capacities and capabilities and then applies obtained data in designing jobs, products, work place, and even life place and equipments. For this reason, Ergonomics is also called human factors engineering. By applying the science of ergonomics in job design can prevent many occupational injuries and achieved to productivity increasing. The aim of this study was to investigate the influence of ergonomic factors on stress and job satisfaction of employees in the health care sector of Rasht city. To gather needed information for this research, in addition to studying related books and articles in this field, gathered data were analyzed from 290 questionnaires that were distributed randomly among the statistical population. To measure the variables in this questionnaire the 5 options of Likert scale was used and for data analysis the analysis loading factor by help of SPSS software, Visual PLS was used. Noting the questions that designed, the gained results suggest that the ergonomics factors have a negative impact on stress. So in results more consideration to ergonomics factor in general reduces stress. Also the stress has a negative impact on job satisfaction; it means the more the stress increases, the more the job satisfaction reduce. It was also observed that more attention to ergonomic issues causes job satisfaction increased. It means it has a positive relationship with that.
Keywords: ergonomic, stress, job satisfaction, health care

INTRODUCTION

today health and care organizations are facing new challenges. Meet the needs and expectations of patients every day is becoming more difficult. Therefore, healthcare professionals should look for ways to provide needed services to patient more effective and efficient. In the health and care sector, hospital as one of the most important provider institutions of health and care that by its especial facilities in returning physical and mental health of patients in the community, educating healthcare specialists, medical researches and finally, plays a vital role in health promotion of the society. Providing optimal care and improving clinical processes without the participation of all staff and providing continuous, optimum and efficient services by them is not allowed. (Mossadegh Rad, 2004).

Among the available staffs in hospitals nursing activities due to providing medical care to patients and more relations to them is important more than any other group. It is obvious that providing optimal nursing services are associated with the quantity and quality of present nurses at the hospital. The nursing section is the largest section and hospital nurses form the largest human forces of the hospital. Existing skilled and experienced nurses is essential in improving hospital care. Nurse's responsibilities are very heavy. Nursing profession due to its nature of boarding work with patients is hard, circadian and accompanied by severe psychological stresses. Occupational injuries in nurses are much higher due to pressures caused by job and unusual facilities and working equipment. Any inattention of nursing cadre leads to quality decrease of caring provided to patients. Therefore, compliance with standards for workplace can lead to the reduction of nurse's occupational stress (Mossadegh Rad, 2004).

Using ergonomics science and evaluating people, job, equipment features and their workplace, and the interaction between these factors can help to designing working systems with adequate safety and high efficiency and

productivity and thereby reduce the causes of accidents and muscular - skeletal injuries in staff and lead to health promotion and enhance productivity and performance in them (Khoshbakht and others, 2011).

Health care organizations Because of the importance of the duty that are responsible for in preventing care and cure are in a special position in society Job dissatisfaction of staffs of health care centers causes decreasing in provided services quality and finally dissatisfaction of patients and paying attention to their needs and views in fact is paying attention to health and care.

The impact of environmental and occupational harmful factors on service providers and recipients health in the health care of Rasht undoubtedly have negative economic effects, but the basic point is the ability to prevent because injuries and disease-producing factor in these environments are predictable, identifiable, preventable and controllable and in other hand working personnel during facing with these problems are available. To achieve this objective, the principles and standards in different fields including environmental health and occupational health should be observed.

During accomplished researches in the health care sector in Rasht, the lack of attention to ergonomics principles not observing them in workplace cause too much costs for employers and employees and will cause efficiency reduction and increase the staff's stresses. If the ergonomics technology is applied correctly, can eliminate or reduce injuries and health problems and occupational safety in the workplace and increase efficiency. However, in job designing enough attention do not paid to them.

Theoretical framework

Ergonomics

Ergonomics is derived of two Greek ergo meant words and nomos meant law. But in practical terms, the science of ergonomics is the science collection that combines biology, human physiology, systems and procedures, the jobs and workplace design, that tried to design tools, equipment and work environment with considering their physical, intellectual and human limitations and interests ability. (Hasani, Mubaraki, moghadamifard, 2012). Ergonomic includes aspects of work psychology and physiology engineering.

In Engineering Psychology, the aspects of processing task-relevant information will be examined. In a safety and occupational health perspective this dimension of ergonomic is designing working methods with the goal of accidents reduction caused by human errors. In the second domain (job physiology), the exchange of energy and body metabolism are proposed. Concepts of fatigue, evaluating the static and dynamic jobs and work regimes and rest in perspective of work physiology are analyzed (Karzar Jeddivand, 2002).

Occupational Stress

Job satisfaction today is one of the most important events in the social life and is a serious threat to the workforce health in the world, so that the International Labor Organization has explicitly stated that the most well-known phenomenon that threatens worker's health is occupational stress. (Lotfi Zadeh, Nour Hasym , Habibi , 2011). Individual faced with a stressful job when the harmony between his business needs with capabilities, abilities and desires is not available. In this definition in addition to emphasizes the lack of coordination with person abilities and capabilities the Individual desires also paid attention. Kendall and colleagues have been introduced stress as a normal and predictable experience in the life and work and have been emphasized that all results of stress are not negative and sometimes has positive consequences (Kendall, 2000).

Job Satisfaction

Job satisfaction is an important factor in career success. Job satisfaction is a factor that increases performance and personal satisfaction. Researchers have defined job satisfaction in various views. Certain combination of different factors whether internal such as the feeling of pleasure from doing things or external, like salaries and benefits and workplace relationships cause the person to be satisfied of his job(Kaldi and Asgari, 2003).

Vovrome (2004) knows job satisfaction as an employee's reaction to the role that plays in their work. Spector (2007) argues that job satisfaction is an outlook which shows the people's feel about their jobs in general or in its different areas. Ivanowich and Donnelly (1998) defined job satisfaction as a general concept and person's attitude toward the job as a general attitude. Next to this attitude the job satisfaction approach consider the collection person's attitude towards various aspects of the job (Keramati and et al, 2012). Job satisfaction is a pleasurable or positive emotional state that will result of an individual assessment of the job or career experience(Amin, 2013). job satisfaction is a measuring criterion of emerging from the Process of creating a human supporting atmosphere in any organization (Stephens, 2007).

Conceptual model of the research

in the present study ergonomic factors are suggested as the independent variable of the research that included engineering psychologists and job physiology. On the other hand, job stress is considered as the mediator variable and finally the dependent variable of this study is considered, employee's job satisfaction.

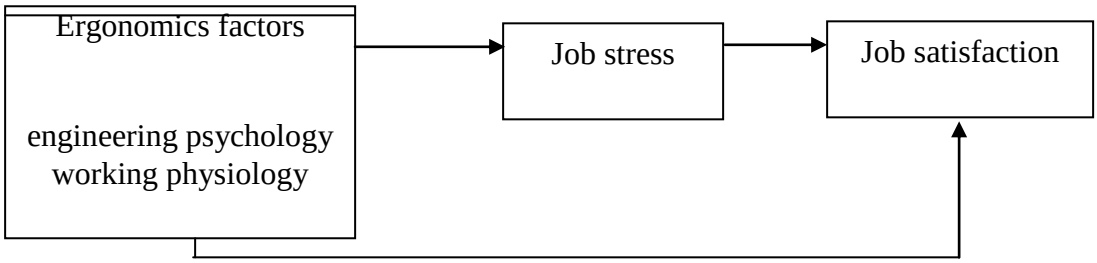

Figure1.

Research objectives and hypotheses

the aim of this study was to investigate the effects of ergonomic on stress and job satisfaction of employees through studying the way of doing job and working conditions and its compliance with mental and physical characteristics of human body. In fact, we examine to what extent the effort to make work balance with humans can affect the employees' work activities. Hypotheses are as follows:

First hypothesis: ergonomic factors are influence on job stress of employees.

Second hypothesis: job stress has impact on job satisfaction.

Third Hypothesis: ergonomic factors have influence on job satisfaction of employees.

RESEARCH METHODOLOGY

this research in terms of purpose is applied research and in terms of method is practical. The statistical population of this research is all hospitals in the city of Rasht, which includes 12 public and private hospitals. Since the access to all hospitals was not possible for researcher and also due to lack of time, among those only 5 hospitals were as the available community that the total number of working nurses in these 5 hospitals were 1147 persons. Because in this study, variables (questions) were value type with ordinal scale and the size of the community is limited for determining sample size the Cochran formula was used that the number of required sample were 288 patients. Hence 320 questionnaires were distributed among nurses and 290 numbers were received and analyzed.

In the present study, the primary tool of data collection is questionnaire that in total included 48 questions. 18 questions are about ergonomics that include work Physiology needs (12 items) and psychological needs (6 items). Also 15 questions are on job stress and 15 questions on job satisfaction. For designing these questions the five option Likert scale has been used. To determine the reliability of the questionnaire used in this study Cronbach's alpha method is used that total reliability was calculated 0.87.

Research findings

in this section obtained data from the questionnaire were analyzed using descriptive and inferential statistics that is shown below.

RESULTS OF DESCRIPTIVE STATISTICS

among this result 37 persons it means 12/8% are below 25 years, 72 persons it means 24/8% are between 25 to 30 years, 73 persons ,it means 25/2% were between 30 and 35 years and finally 108 persons it means 37/2% were older than 35 years. From 290 responders, 87 people have been men that form 30% of the sample numbers and the remaining 203 persons were female that form 70% of the sample. From 290 of answerers 92 people were single that form 31/7% of the sample numbers and 198 others were married that equivalent to 68/3 of the samples

size. With evaluation on the educational levels of responders, it was determined that 231 people, or 79/7 percent of them were B.A. students, 59 persons that is equivalent to 20/3 % have a master's degree.

Confirmatory factor analysis

results of factor analysis showed that all factor loadings have a higher amount of 0/4, which means that the amounts of factor loadings of questions were acceptable and all measuring were used and none of the questions were removed.

Analyzing factor structure

When the variables of the research include hidden and unhidden variables and our goal is analyzing the Simultaneous effect of hidden variables on each other or on unhidden variables the Structural equation model is used. The research variables are working Physiology, engineering psychology, job stress and job satisfaction. The number of respondents is 290 persons. The results and general model of this research due to effects of variables on each other simultaneously after the implementation and performing in the Visual PLS software are shown below. The results of factors structures in standard mode are as follows:

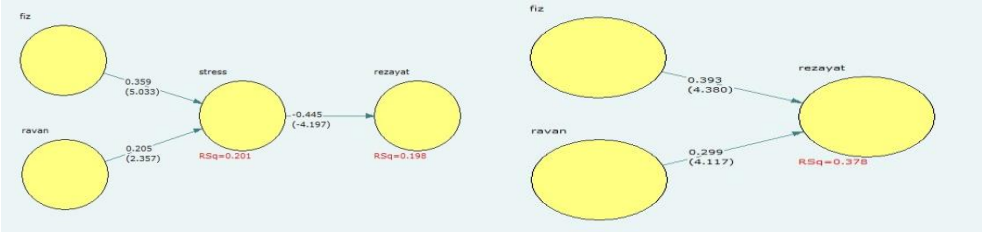

Figure2.

Due to The top three pictures which are the analysis of the conceptual model of the Visual PLS software, it can be consider that all hypotheses of this study were confirmed or in other words they can be denied. Significance of Coefficients estimated impact and hypothesis testing of the survey is presented in Table 4-11.

Table1.

Result	T statistic	Standard deviation	Average of sub samples	Estimating total samples	The studied relation
confirmation	-4.581	0.087	-0.420	-0.399	From ergonomics to job stress
confirmation	-3.319	0.097	-0.263	-0.324	From job stress to job satisfaction
confirmation	2.015	0.161	0.408	0.326	From ergonomics to job satisfaction
confirmation	2.592	0.079	0.256	0.205	From engineering psychology to job stress
confirmation	4.157	0.086	0.351	0.359	From work physiology to job stress
confirmation	4.380	0.089	0.372	0.393	From engineering psychology to job satisfaction
confirmation	4.117	0.072	0.338	0.299	From working physiology to job satisfaction

Model Evaluation in general

when the model has similar characteristics the possibility of testing it and evaluating the model is provided. About processing and validity power of the model, several parameters were evaluated as shown in Table 4-16 all studied parameters demonstrated that the model has been fit well.

Table 2. model processing

RMSEA	CFI	TLI	IFI	RFI	NFI	Model
0.097	0.895	0.862	0.878	0.896	0.952	Estimating the model
The number close to 0/1	The number close to 1	The number close to 1	The number close to 1	The number close to 1	The number close to 1	Acceptable amount

CONCLUSIONS AND RECOMMENDATIONS

By analyzing the results that was obtained from the evaluation of model using Visual PLS software, it was observed that in the hospital's environment the ergonomic factors has a negative effects on the stress. In other words, paying more attention to ergonomic issues in general, reduce nurse's stress. Another result was obtained, makes this fact clear that stress has a negative impact on job satisfaction, it means the more stress among nurses increased, the more it causes them job satisfaction decreasing. It was also observed that the ergonomics issues have a direct impact on job satisfaction. In fact, more attention to ergonomic issues in hospitals can increase job satisfaction of nurses. One of the major problems in the hospital setting is the nurses' job satisfaction. One factor that can increase their satisfaction is paying attention to ergonomic issues in the workplace. In this study, both working physiology and engineering psychology that were chosen as ergonomics aspects and the results of the research showed that both factors on have a positive influence the job satisfaction. In other words, one of the strategies to increase nurse satisfaction, considering these two factors more.

Practical recommendations

Since paying attention to ergonomic factors reduces stress and consequently promotion of job satisfaction among nurses, it is suggested that in designing hospital environment enough attention paid to the ergonomic issues. Stress reduction causes job satisfaction increasing among nurses and ultimately this fact increase the efficiency of their work. Observing ergonomic principles are related to employees themselves and by compulsory we cannot force them to do its principles, but by making motivation in staffs can encourage them to do these principles.

The results of this research showed that lack of attention to ergonomics principles and not observing them in hospital environment, reduces efficiency and increase staff stress, and this is followed by a lot of costs for the Employer and the staff.

If the ergonomics is applied correctly, it can eliminate or reduce injuries in the workplace and increase efficiency.

Citing the obtained results of hypothesis testing it is suggested that hospital in order to reduce stress among nurses pay necessary attention to working physiology issues and engineering psychology. Because the hypothesis testing results have proven the direct impact between working physiology and engineering with stress reduction.

According to the gained results of the hypothesis testing has shown that paying attention to working physiology and engineering psychology in hospital setting causes the increase of job satisfaction of nurses, it is recommended that in designing hospital working environment enough attention paid to the working physiology and engineering psychology.

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