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The Survey of Job Injuries and Mental Health Disorders among Clinical Nurses from Ergonomics Aspect

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Abstract: In order to maximize the use of technology, to improve health status and job satisfaction in the workplace, ergonomics is used. This study aimed to survey psycho-physical state of clinical Iranian nurses and render guidelines to elevate their problems. The present study was conducted in affiliated hospitals of Azad University at Shahrood city in Iran. Interviews and two questionnaires of NMQ (Nordic Musculoskeletal Questionnaire) and GHQ28 (General Health Questionnaire) were used to gather data. Findings showed that the nursing staff were suffering muculoskeletal injuries and mental health disorders. The results showed that several factors involved in the incidence of them among Iranian nurses such as lack of health and safety education, lack of equipment, continuous work shifts, low wages, lack of job security and lack nurses' awareness about prevention methods of career injuries. The findings could attract most officials and stakeholders' attention of different organizations and companies, particularly health care institutions to employee health and prevention of occupational injuries resulting from research.

Key words: Job, injuries, clinical, nurse, ergonomic, Iran

INTRODUCTION

In last century, the development of science and technology has been led widespread growth of economy in industrial countries. Today, material wealth resulting from application of technical knowledge and awareness in technical and scientific domains In this context what about social progress along with economic continuing growth is important is the implementation of technical knowledge with its users needs and cultural, social and physical conditions in the application of the knowledge (Hegarty *et al*., 2003). Many of the evidences particularly in developing and industrial countries have shown negative results such as low level of production quality and the increase in injuries and occupational accidents due to disproportion between the technology and its users (Mardokhy, 1996). The mentioned problems can be obviated by ergonomics. As a matter of fact, ergonomics is a science that corrects and optimizes work place, job and equipments and makes them compatible with human limitations. Applying the ergonomics is highly noticed for management of each organ (Habibi, 2005). In order to maximum use of technology, staff welfare and the use of production facilities and services combined with efficiency for achieving higher production, the improvement of health status, job satisfaction in the workplace ergonomics is used. Today, health care sector is one of the most important areas for sustainable development in human societies due to direct relationship with human health. Nurses are the major part of health system that the ergonomics is hoped to guarantee their mental health (Sfandiary, 2001). Nurses are disposed to physical damages such as musculoskeletal pains and limb strain due to their occupation (Nakhaei *et al*., 2006). These injuries in nursing activities with ergonomic risk factors that is specified in the ergonomics standard planning is related and in most cases the injuries are attributable to the factors related to force and organ traction conditions (Malon, 2000). It is shown that nursing is so high-risk for such damages (Nelson *et al*., 2003). Knibb and Friel found

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that low back pain is the most prevalent complaint among nurses (56-90%) that is little higher than other people (Knibb and Friel, 1996). Such complications debilitate >600000 workers per year in the United States that burden $45-54 million (Maul *et al*., 2003) then, this study aimed to survey ergonomic or psycho-physical state of Iranian nurses and render guidelines to elevate their problems.

MATERIALS AND METHODS

The present study was conducted in affiliated hospitals of Azad University at Shahrood city in Iran at which 130 nursing staff were involved. Two questionnaires of NMQ (Nordic Musculoskeletal Questionnaire) and GHQ28 (General Health Questionnaire) were used to gather data. The NMQ were consisted of 6 parts; the first part involved the demographic data of participants such as name, age, gender, Body Mass Index (BMI) and hour/sec of work per day. The second part involved questions about nursing as an occupation. The 3rd, 4th and 5th parts involved musculoskeletal damages over the neck, back and shoulder, respectively and the 6th part involved 28 questions surveying mental health of nurses. GHQ28 included 4 scales as: physical symptoms, anxiety and sleep disorders, social dysfunction and depression. The score of performance criteria was 10-100. Average <50 indicated mental health disorder and above 50 indicated mental health. The scientific validity of first part of the questionnaire (NMQ) was determined by content validity method. The questionnaire of Nordic (designed by finish scientists city of Tampar in 1992) was used for musculoskeletal damages. The scientific validity of GHQ28 was proven by plebiscite and statistical analysis with sensitivity and specificity of 91.2 and 94.07, respectively. Reliability of GHQ28 was calculated as 91%. The present study utilized SPSS and Fisher, Chi-square and t-tests within significance of 5%. About 25 formal and informal interviews were conducted. The interviews provided in depth information that helped to further explain and describe the nurses' responses on the questionnaire.

RESULTS AND DISCUSSION

About 61.5% (80) participated in the study. Findings showed that 91.3% of cases were female and 66.2% were married. About 52.5% aged between 30-35 years and 52.5% had height range of 156-165 cm. About 40.0% had weight range of 56-65 kg. About 73.8% had BMI between18.6-25 (Table 1).

Considering BMI (18.6-25) 65% suffered shoulder pain 73% of nurses with full-time shifts suffered back pain. There were significant relationship between physical damages and demographic profile of the nurses ($p<0.05$) (Table 2).

Table 1: Demographic profile of nursing staff

Features	N	Percentage	Mean	SD
Age				
>30	12	15.0	-	-
30-35	42	52.5	33.5	0.50
35-40	21	26.0	-	-
40<	5	6.5	-	-
Height				
>156	13	16.0	-	-
156-165	42	52.5	163.2	0.66
165<	25	31.5	-	-
Weight				
>56	10	12.5	-	-
56-65	32	40.0	64.2	0.78
65-70	24	30.0	-	-
70<	14	17.5	-	-
Sex				
Female	73	91.3	-	-
Male	7	8.7	-	-
Marital status				
Married	53	66.2	-	-
Single	27	33.8	-	-
Pregnancy status				
Yes	5	6.3	-	-
No	75	93.7	-	-
Body Mass Index (BMI)				
>18.5	4	5.0	-	-
18.6-25	59	73.8	23.3	3.8
26<	17	21.2	-	-
Work experience (Month)				
≥60	25	31.3	-	-
61-120	46	57.5	85.2	4.8
120<	9	11.2	-	-
Job				
Nurse	60	75.0	-	-
Manager	20	25.0	-	-
Job position				
Full time	64	80.0	-	-
Part time	16	20.0	-	-
Work shift				
Fix	11	13.8	-	-
Variable	69	86.2	-	-

Table 2: The relationship between demographic profile and musculoskeletal disorders

Features	Neck pain	Back pain (%)	Shoulder pain	p-value
Age				
>30	15	12	31	-
30-35	10	23	23	-
35-40	25	28	26	-
40<	50	37	20	-
Height				
>156	55	17	56	-
156-165	23	20	12	-
165<	22	63	32	-
Weight				
>56	34	16	39	-
56-65	32	29	22	-
65-70	22	32	19	-
70<	12	23	20	-
Sex				
Female	94	95	94	p<0.05
Male	6	5	6	-
Marital status				
Married	73	51	36	-
Single	27	49	64	-

Table 2: Continue

Features	Neck pain	Back pain (%)	Shoulder pain	p-value
Pregnancy status				
Yes	23	81	44	-
No	33	19	56	-
Body Mass Index (BMI)				
>18.5	12	8	11	-
18.6-25	59	58	65	-
26<	29	34	24	-
Work experience (Month)				
≥60	55	52	43	p<0.05
61-120	24	30	39	-
120<	21	18	18	-
Job				
Nurse	54	60	56	p<0.05
Manager	6	40	44	-
Job position				
Full time	70	73	65	p<0.05
Part time	30	27	35	-
Work shift				
Fix	73	81	37	-
Variable	27	72	63	-

The population mental health score was 48.4. Findings showed significant relationships between mental health and job position (p<0.05) (Table 3). Also there was not significant relationship between physical injuries and mental health status (Table 4).

Findings showed that most of female nurses were suffering from physical injuries. Other studies confirm these results (Smith *et al*., 2003a, b). Also Nakhai found that 53.5% of female nurses suffered low back pain and Mosadeghrad found that 32.4% suffered neck pain (Nakhaei *et al*., 2006; Mosadeghrad, 2004). These problems are related to the nature of nursing work and activities leading to sudden movements. Interviewees expressed that constantly doing actions such as moving patient, covering patient's clothes, changing patient status, etc., in professional life has caused that nurses were suffered musculoskeletal injuries. The results showed that who worked as a nurse and full-time suffered occupational injuries more than others, similar to what Mosadeghrad and Habibi found in their studies (Mosadeghrad, 2004; Habibi and Molaaghababaei, 2007). One of the female nurses stated that because of transition from emergency department to orthopedics and increased hours was suffered to back and shoulder pains. Studies have shown that type of service location, hours, work shift and patient transfer play an essential role in occupational injuries rate (Nakhaei *et al*., 2006). The study of Menzel confirms these results. They found that muscular and skeletal problems in nurses working full time, were highe (Menzel *et al*., 2004). Nurses working more than one shift are more tired and are less accurate. One of the nurses stated that he was forced to work more because of low wages This has caused that he constantly had back pain. One of the main reasons for working in more than one shift is low salary of Iranian nurses. Since, the nursing profession is considered as one of the exhausting jobs, increase their wages affects on the reduction of job injuries. Majority of the population reported back pain when working in nursing job. One of the female nurses stated that she suffered to back pain due to repetitive work and wrong position of body when working. Back injuries are one of the most common

Table 3: The relationship between mental health scores with the demographic profile

Features	Mean	SD	p-value
Age			
>30	62.1	12.2	-
30-35	64.2	13.3	-
35-40	47.3	11.2	-
40<	33.6	11.1	-
Height			
>156	63.1	12.1	-
156-165	64.3	11.5	-
165<	78.6	12.1	-
Weight			
>56	58.3	11.2	-
56-65	66.5	13.2	-
65-70	67.2	12.1	-
70<	69.2	11.1	-
Sex			
Female	25.6	13.9	-
Male	17.5	4.8	-
Marital status			
Married	23.7	13.2	-
Single	27.2	14.2	-
Pregnancy status			
Yes	66.8	12.1	-
No	68.1	11.2	-
Body Mass Index(BMI)			
>18.5	49.3	12.6	-
18.6-25	60.5	12.1	-
26<	68.1	12.5	-
Work experience (Month)			
≥60	56.2	10.2	-
61-120	63.5	11.1	-
120<	48.4	11.6	-
Job			
Nurse	24.6	14.5	-
Manager	25.6	10.2	-
Job position			
Full time	23.3	13.6	p = 0.04
Part time	31.0	11.6	-
Work shift			
Fix	22.5	9.0	-
Variable	29.9	15.7	-

df = 78; t = -2.0

Table 4: The relationship between mental health and musculoskeletal injuries

Musculoskeletal injuries	Mental health (%) NO	Yes	p-value	F
Back	31	34	0.26	1.21
Neck	37	35	0.68	0.84
Shoulder	24	29	0.90	0.63

problems of nursing staff. Tasks such as transferring patients from bed to stretcher, changing patient status on bed, etc. are main factors causing these problems. Some of those interviewed said that lack of equipment such as cranes for patient transfer is the most important factor nurses job injuries. Use of assistive devices for transportation of patients and training of nurses lead to reduce skeletal muscular injuries (Noorbala and Mohamad, 2001). Interview, nurses expressed that the education of working methods with devices not only reduce occupational injuries but also cause patient satisfaction and comfort. One of the nurses stated that having access to protective equipment and training of employees about the protection principles will reduce of occupational injury. Although, studies have shown that throughout the world a significant number of clinical nurses are suffering from skeletal and muscular disorders due to work and nearly no nurses are safe from occupational damages (Menzel *et al*., 2004). But studies have shown that a ergonomic 5 years plan substantially reduced the rate of back and shoulders injuries and working days lost (Habibi and Molaaghababaei, 2007). The findings showed experienced nurses had less muscle and bone disorders. It may be because the awareness of experienced nurses of ergonomics. Studies have shown that ergonomics training programs and increase employee awareness about musculoskeletal injuries resulting from work, substantially reduce muscles and bones pains among nurses (Malon, 2000).

Considering safety equipment, necessary training and providing more amenities will reduce job damages in clinical settings. Studies have showed that occupational injuries cause mental, emotional and social disorders also they will lead to loss of the active labor force and enormous costs in organizations. These costs include employee costs and lost opportunity costs (Fisher, 2003). Findings showed that the nursing staff suffered mental health disorder. In this study, there was relationship between job position and mental health. Studies have shown that nurses who were working in 12 h shifts, suffered less physical injuries but more psychological stress. In contrast, nurses who were working in two 8 h shifts were very tired after work but had less psychological pressure and had more time to do activities at home (Mosadeghrad, 2004). Interviewees expressed that sometimes facing equipment shortages or defective equipment is stressful for them. One of the male nurses stated that lack of job security and working part time in three hospitals has caused that he has had not enough time to rest and was under work pressure. Interview, some nurses expressed that nurses shortage in the clinical settings has caused that they worked over their capacities and this problem has increased their fatigue and job stress.

CONCLUSION

In this study, findings showed that a significant number of nursing staff suffered job injuries and mental health disorders. The researchers concluded that several factors involved in the incidence of these disorders among Iranian nurses such as lack of health and safety education, lack of equipment, continuous work shifts, low wages, lack of job security and lack nurses' awareness about prevention methods of career injuries. The findings could attract most officials and stakeholders' attention of different organizations and companies particularly health care institutions to factors such as prevention of occupational injuries resulting from work, design and implementation of educational and athletic programs, ergonomics principles in jobs providing solutions to prevent employees' mental disorders that can create physical damage and massive spending. Further studies should be done about physical disorders in other settings such as laboratory and radiography, etc.

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