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Original

The Prevalence of Musculoskeletal Disorders and Assessment of Body Status among Employees of Shahid Chamran University of Ahwaz

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Abstract

Introduction: Postural evaluation can assist in detecting or predicting the risk factors of musculoskeletal disorders. Therefore, the present study aimed to investigate the prevalence of musculoskeletal disorders and to assess the body status of employees of administrative departments of Shahid Chamran University of Ahwaz during work using RULA method. **Methods:** This cross-sectional study was carried out on 266 university staffs using Nordic Musculoskeletal Questionnaire (NMQ). The workstations of the employed individuals were selected using RULA questionnaire. The data were analyzed by SPSS Version 16 using Chi-square and independent t-test.

Results: The participants of the study included 47.7 percent of female and 52.3 percent of male employees. The results showed that backache (53.4%) and the neck ache (53.4%) had the highest prevalence within the employees. In addition, 62.5 percent of people were at the corrective levels of 2 and 3. **Conclusion:** Inappropriate postures can act as an important risk factor regarding musculoskeletal disorders. The results revealed that women were at a higher risk of ergonomic risk factors.

Key words: Administrative occupations; Musculoskeletal disorders; RULA

Introduction

Today, occupational musculoskeletal disorders can be mentioned as one of the most common problems in the world.[1,2] Since 2010, the ILO has introduced musculoskeletal disorders as one of the most common diseases of the current century. In 2013, these disorders were mentioned as one of the three top occupational diseases.[3] On average, the loss of working time due to musculoskeletal disorders is equal to one third of all work-related disorders.[4] These disorders rank second in the United States among other diseases and six million people are affected with them.[1] In the UK, musculoskeletal disorders are the most frequent work-related disorder.[5] The NIOSH organization estimated the dues of $ 20,000 and $ 25,000 for the lost work days related to shoulder-related injuries and backache, respectively.[4] Today, these disorders are the cause of most work leaves, which apply financial pressure on

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the organizations and industries.[6-8] In administrative occupations, people spend 50 percent of their day and an average of over 25 years in their careers during their life cycle; in other words, administrative occupations lie among those jobs with high prevalence of musculoskeletal disorders.[9,10] Eighty percent of the following behaviors such as sitting, working with computer, having repetitive movements and static postures, as well as adverse environmental conditions are observed among the individuals that can lead to disorders.[2,11,12] In this regard, RULA was introduced as one of the posture assessment methods. The aim of this method is to rapidly evaluate the risk of musculoskeletal disorders in the upper part of the body, exposure to postures, muscular strength, and muscular movements that lead to repetitive movements. In fact, RULA can act as a solution for correcting postures of work.[13,14] Different studies were conducted to evaluate the administrative occupations through RULA method. In this study, we assessed the employees of Shahid Chamran University of Ahwaz using the Nordic questionnaire, evaluated their postures using a rapid risk assessment method to examine the prevalence of disorders, and investiagted their working conditions to correct their working postures.

Methods

This study aimed to investigate the prevalence of musculoskeletal disorders and assess the status of work postures of administrative staffs of Shahid Chamran University of Ahwaz. In order to determine the sample size, 266 individuals from the faculties and central organizations of the university were used. They agreed to participate in the study and accounted for almost 70 percent of the total staffs. The inclusion criteria were absence of an illness or accident during the recent year. Moreover, the participants should have no other jobs outside the university. The data were collected from Nordic questionnaire concerning the participants'' individual characteristics and musculoskeletal disorders. The questionnaire consists of two parts:

a) A general questionnaire including demographic data and information about pain, discomfort, and numbness in the neck, shoulder, elbow, wrist, hand, one or both hip-thighs, one or both knees, one or both legs and ankles over the past 12 months, 7 days. This questionnaire also included items regarding the respondents' and inability to perform the daily activities during the past 12 months due to musculoskeletal problems in one or several parts of the mentioned organs.

b) A specific questionnaire related to musculoskeletal disorders in the neck, shoulder, waist, wrist, and arm. In general, this questionnaire provides beneficial and trustworthy information on the symptoms of musculoskeletal disorders, which is used for deeper analysis or corrective decision making.

Of the 266 people who cooperated in the initial stage of the study, 20 workstations were selected due to repeated work and different risk factors. Then, we used the the observational method (filmed) to analyze the occupations. Each job was divided into its related tasks and sub-tasks. Since administrative occupations put the upper organs at risk, RULA method was used to evaluate the postures during work. The quick assessment method of the upper organs entailed three main steps: 1. Recording body status during work. 2. Scoring the body status using a system that divides the body into two parts of A:arm, forearm, wrist and B: neck, body, legs. Each main section of the body is evaluated based on its movement rate from the natural state. After combining the A and B codes, we obtained the points C and D. The final point, achieved from points C and D indicated the severity of the posture3. Specifying the levels of corrective actions presented in Table 1. The data were descriptively analyzed by SPSS16 using Chi-square and independent t-test.

Table 1. Risk level and priority of corrective actions in the RULA method

Level of corrective action	Final point	The necessity of action and its time
Level 1	1 or 2	The postures that are not fixed for a long time or are not repeated severely are acceptable.
Level 2	3 or 4	Further studies are recommended in this regard and possible ergonomic changes and interventions may be necessary.
Level 3	5 or 6	Further research is required, possible ergonomic changes and interventions may be essential in the near future.
Level 4	7 or more	Further studies are suggested, possible ergonomic changes and interventions may be immediately essential in the near future.

Results

Of the 266 individuals who participated in the study, 127 (47.7%) were female and 139 (52.3%) were male. The mean age of women was 37.15 (9) years and that of men was 39.9 (39). The female and male participants had 13.15 (7.8) and 14 (9.2) years of work experience, respectively. Regarding the education, 19.(2) percent of the participants had master's degree, 36.8 percent were undergraduate, and 31.(2) percent had diploma. Considering the working shifts, 72.(9) percent were working in the morning and the rest were working in rotating shifts. As shown in Tables 1 and 2, the highest percentage of musculoskeletal disorders in the last year was related to the waist and neck. The prevalence of backache seems to be higher among women than men (P <0.05). The findings of Table 1 reveal that 19.2 percent of the participants with the neck disorder were unable to work and 28.9 percent of the individual who had backache were unable to work in the last year. Independent t-test results did not show any significant correlations between the participants' work experience and age (P> 0.05). More than 50 percent of all participants who reported discomfort in different parts of their bodies were not able to work and therefore were on leaves. As represented in Table 2, a significant relationship was seen between men and women regarding pain reported in different parts of the body. The results show that women are 2.11 times more at risk in their waist (P = 0.03, OR = 2.11); in other words, musculoskeletal disorders are more prevalent among employed women. Moreover, the level of education and shift work did not demonstrate any significant relationship with disorders in different parts of the body. The results of rapid assessment in the upper organs showed that 62.5 percent of the occupations were at the levels 2 and 3 of the corrective actions.

Table 2. The prevalence of musculoskeletal disorders in different parts of the body in different periods

Parts of body	7 days ago frequency (percent)	12 months ago frequency (percent)	Disabling disorders in the last year
Neck			
yes	(33.10)88	(41.00)109	(19.20)51
no	(9.66)178	(59.00)157	(80.80)215
Upper part of waist			
yes	(20.70)55	(28.60)76	(12.00)32
no	(79.30)211	(71.40)190	(88.00)234
Lower part of waist			
yes	(45.90)122	(53.40)142	(28.90)77
no	(54.10)44	(44.60)124	(71.10)189
Shoulder			
yes	(30.10)80	(37.20)99	(16.50)44
no	(69.90)186	(62.80)168	(83.50)222

Table 3. Prevalence of skeletal disorders among women and men within the recent year

Gender / Body parts	male		Female		OR	*P*-Value*
	Frequency	Percent	Frequency	Percent		
Lower part of waist	62	43.70	80	56.30	2.11	0.00
Neck	48	56	61	44	1.75	0.02
Shoulder	44	44.40	55	55.60	1.65	0.05
Wrist	40	46.50	46	53.50	1.40	0.19
Elbow	15	39.50	23	60.50	1.82	0.08
Upper part of waist	34	44.70	42	55.30	1.52	0.12

The significance level was set at 0.05.

Table 4. The final score and risk level

Total percentage	Corrective Priority Level	Percentage of postures	Final score
37.50	2	16.70	3
		20.80	4
25	3	16.70	5
		8.30	6
37.50	4	29.20	7
		8.30	8

Discussion

The present study aimed to investigate the musculoskeletal disorders among the employees of Shahid Chamran University of Ahwaz using the Nordic questionnaire and posture assessment by RULA method. The results demonstrated that the highest prevalence was related to backache (53.4%) and neck ache (41%), which are in line with many other studies.[15,16] On the other hand, the findings of our study showed that administrative occupations could lead to high risk of musculoskeletal disorders. In a study conducted over the musculoskeletal injuries in office work environment, Chobaneh et al. reported 49 percent and 47 percent incidence of waist and neck symptoms, respectively.[11] Vali-Pour et al. (2015) reported the prevalence of musculoskeletal disorders in the waist and neck of the administrative staffs as 51 and 36.5 percent, respectively.[2] Employees reported disorders in at least one part of their body during the previous 12 months and even 7 days. This finding is consistent with similar studies.[6,17,18] The prevalence of neck ache was 63, 37.2, 55.8, and 33 percent in Finland, Denmark, Greece, and Holland, respectively[19-23]. Moreover, the incidence of musculoskeletal disorders in women was higher than men.

The results of RULA assessments showed that 62.5 percent of jobs were classified in the correction groups of 2 and 3, according to which immediate corrective measures should be taken in the shortest possible time. The results of Nordic questionnaire and RULA method confirmed the high risk conditions for the employees and indicated that appropriate control measures were required.

Conclusion

As the findings demonstrate, we can conclude that musculoskeletal disorders are very prevalent among the administrative staff, especially women. The highest prevalence of musculoskeletal disorders is observed in the neck and waist and effective control measures are needed in accordance with the indices and parameters of the RULA method.

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