



Original Article

The Prevalence of Musculoskeletal Disorders and Associated Factors in Employees of Gilan University of Medical Sciences

Fardin Mehrabian¹, Mohammad Bandehpoor^{2*}, Adel Kamyab², Samaneh Kashi²¹ Research Center of Health and Environment, School of Health, Guilan University of Medical Sciences, Rasht, Iran² School of Health, Guilan University of Medical Sciences, Rasht, Iran

* Corresponding author: Mohammad Bandehpoor

Email: mohammadbandehapoor16@gmail.com

ABSTRACT

Background: Musculoskeletal disorders are one of the most common and costly job-related problems, caused by disruption or damage to one of the organs or tissues of the body. The aim of this study was to determine the prevalence of musculoskeletal disorders, and its relationship with individual characteristics in employees of Gilan University of Medical Sciences.

Methods: This cross-sectional was conducted on 336 employees of Gilan University of Medical Sciences. The Nordic questionnaire was used to evaluate musculoskeletal disorders in different parts of the body.

Results: Overall, 87% of the participants had signs of musculoskeletal disorders in at least one of the organs during the past year, with the most in the knee and back, neck and waist, and the least in the wrists and hip, respectively. The prevalence of waist, knee, and shoulder disorders was significantly higher in women than in men. In addition, the prevalence of musculoskeletal disorders in the lumbar region was significantly higher in obese subjects than in normal weight individuals.

Conclusion: The results of this study revealed a high prevalence of musculoskeletal disorders in the research population. Gender and body mass index were identified as meaningful variables related to the disorders.

Keywords: musculoskeletal disorder, Cumulative, Individual Characteristics

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Introduction

Musculoskeletal disorders related to work represent a group of clinical conditions in the musculoskeletal system that occur as a result of exposure to various risk factors at the workplace (1). It is considered as the most important problems in working environments and costly job-related problems in the world (2). Musculoskeletal disorders are caused by disruption or damage to the muscles, tendons, ligaments, joints and nerves, blood vessels and soft tissue which is one of the most

significant problems faced by ergonomists (1, 2).

In recent years the conditions of working environment have been dramatically changed, as a result of rapid advancement of technology and the widespread application of electronic and digital tools. These disorders can impose individual, social and economic impacts on any society. On the other hand, due to their high incidence, these disorders are considered as a major cause of death and disability among adults in advanced and industrialized countries (3). It is

estimated that in total, direct and indirect costs of musculoskeletal disorders may account for about 1% of the gross national product of industrialized countries. In addition, around 60-90% of adults in their lives suffer from back pain for a while (4).

An estimation in the USA society suggested that the economic burden caused by these injuries was between \$ 45 billion to \$ 54 billion a year. In 1999 nearly one million Americans had been absent from work for the treatment and improvement of musculoskeletal pain. In addition, with population growth and aging, it is estimated that around 59 million people (18.4%) will be affected in the USA by 2020 (5). These disorders are often preventable. Therefore, in order to control risk, it is very important to understand how these disorders are created and manifested in society, so that they can be prevented by changes in the equipment and working condition (6, 7).

Therefore, this study was aimed to determine the prevalence of musculoskeletal disorders among the staff working at Gilan University of Medical Science.

Methods

Study design and sample

This descriptive cross-sectional study was conducted among staff members working at Gilan University of Medical Sciences in 2013. A total of 336 employees were employed in 7 departments including the deputies of education, research and technology, student affairs, treatment and medicine, health, and deputy of development and human resources management.

To determine the sample size, Gorgi's et al. study was used (6). According to the previous report for musculoskeletal disorders as 66% and precision of 5%, the sample size required for this study was 350. In Gorgi et al., the most disturbances observed in the neck and lower back reached to 23.3%. The employees were selected using systematic random sampling method based on the available list of employees. Subjects who have acute injury and trauma in one of the four studied organs, neck, shoulders, hands / wrists and wrists were excluded.

Measurements

The questionnaire consisted of two parts: the first part was demographic information including age, sex, weight and height, level of education, marital status and number of children. Body mass index (BMI) was calculated based on weight in kilogram divided by height in meters squared. The second part was the general form of standardized Nordic musculoskeletal questionnaire (8). The questionnaire includes 40 items identifying areas of the body causing musculoskeletal problems (16, 17). A body map showing nine symptom sites including neck, shoulders, upper back, elbows, low back, wrist/hands, hips/thighs, knees and ankles/feet were completed by the participants. Respondents were asked about musculoskeletal trouble in the last 12 months and last 7 days which has prevented normal activity.

Statistical analysis

Data were described using mean and standard deviation or frequency and percent according to the type of the variable. As chi-square or Fisher exact test was used to study the relationship between variables. All statistical analyses was

performed in SPSS version 18.

Results

In this study 350 questionnaires were distributed, of them 332 participants answered correctly (respondent rate=95%). Of total respondents, 179 subjects (53.9%) were male and 153 subjects (46.1%) were female. The mean age of the participants was 44.7 (standard deviation (SD) = 7.11) years, with the minimum of 24 and the maximum of 65 years old. The average work experience of the community is 18.17 (SD = 6.38) years. The mean of BMI was 25.03 (SD = 3.15). About 34% of the participants were overweight (BMI = 25-30 kg/m²) and 7% were obese (BMI > 30 kg/m²). The majority of the study population (90.4%) were married. Regarding to the level of education 47% had a bachelor degree, 33% had a master degree or doctorate, and rest of them had less than bachelor's degree. More than half of the participants (59%) worked with computers.

Figure 1 shows the distribution of pain during the last year in various organs of the body. Overall, 87% of the subjects had pain in at least one of the organs examined during the last year. The most common musculoskeletal disorders were in the knee area (53.6%) and the lowest musculoskeletal disorders were in the elbow region (13.9%).

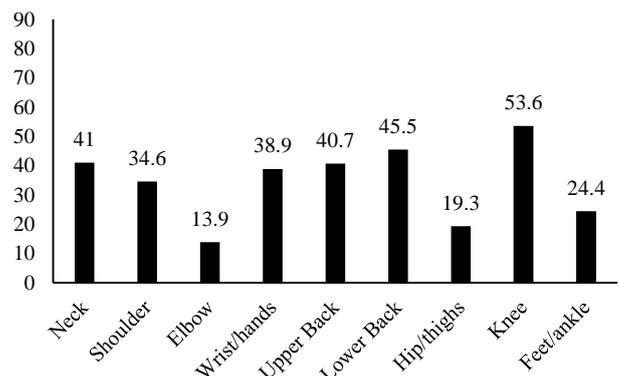


Figure 1. The prevalence of musculoskeletal disorders in nine sites of the body

Table 1 revealed the prevalence of musculoskeletal disorders in terms of significant variables. According to the results, there was a significant relationship between sex and musculoskeletal pain in knee area (P-value = 0.048), waist (P-value = 0.049), wrist (P-value = 0.02) and shoulder (P-value = 0.037). The prevalence of disorders in women in knee (59.5%), waist (46.4%), wrist (47.7%) and shoulder (40.8%) were significantly higher than men showing that women were more likely than men in these four areas suffers from musculoskeletal pain.

In terms of body mass index, there was a significant relationship between BMI and prevalence of disorders in the lower back (P-value = 0.039). Obese subjects with BMI above 30 kg/m² had significantly higher prevalence of musculoskeletal pain in low back (66.7%) compared to subjects with normal weight (38%) and overweight (39.3%). Also, there was a significant relationship between marital status and prevalence of shoulder pain (P-value = 0.021), so that the incidence of abdominal pain in single subjects was significantly higher than married ones.

Table 1. Prevalence of Musculoskeletal Disorders According to the Significant Study Variables

Characteristics	Knee	Lower back	wrist	Shoulder
Gender				
Male	87 (48.6)	64 (35.8)	56 (31.3)	53 (29.6)
Female	91 (59.5)	71 (46.4)	73 (47.7)	62 (40.8)
P-value	0.048	0.048	0.049	0.02
Body mass index				
17-25	112 (58.3)	73 (38)	77 (40.1)	58 (30.4)
25-30	51 (45.5)	44 (39.3)	37 (33)	44 (39.3)
> 30	13 (54.2)	16 (66.7)	12 (50)	11 (45.8)
p-value	0.122	0.039	0.409	0.371
Marital status				
Single	18 (56.3)	16 (50)	16 (50)	17 (54.8)
Married	160 (53.3)	119 (39.7)	113 (37.7)	98 (32.7)
P-value	0.753	0.258	0.174	0.021

Value in the parenthesis are percent

Discussion

The results of this study showed that the most prevalent musculoskeletal symptoms were knee pain (53.6%), lower back (45.5%), upper back (40.7%), and neck (41%), respectively. The lowest symptoms of musculoskeletal pain was in the elbow region (13.9%) and hip (19.3%).

According to the findings of Choobineh et al. in 2007 the most prevalent and musculoskeletal disorders were in the neck, back, shoulders and waist (9), which are consistent with the results of the present study. Edlich et al. reported the shoulder pain as the highest incidence of musculoskeletal disorders (10). In this study, there was no significant relationship between age and musculoskeletal disorders that is in agree with previous studies (11, 12), but is not in agreement with the study by Choobineh et al (13).

The findings of the present study demonstrate that the prevalence of musculoskeletal disorders in women was higher than in men. This finding was in agree with previous studies (6, 14). Regarding the fact that in the design of many workplace, anthropometric data used mainly related to men rather than women, henceforth these places are inappropriate ergonomically for women (15). On the other hand, in comparison to men, women are more likely to be exposed to various occupational stresses when performing similar tasks, which can affect their various aspects of health, including musculoskeletal disorders (14, 15).

The findings of the study indicated that there is a significant relationship between the prevalence of and musculoskeletal disorders in shoulder with marital status and this is not consistent with previous findings (6). Also, the results of the research showed that there is a meaningful relationship between prevalence of musculoskeletal disorders in the lower back and BMI. Previous study also found a positive association between BMI and musculoskeletal symptoms in particular for lower extremities (16, 17).

There are contradictory results in the relationship between the prevalence of musculoskeletal, and duration of work as the findings of some studies suggest that people with a higher work experience have less musculoskeletal disorders (18, 19). This can be due to less job stress because of more work experience (14). Findings of the present study suggest that there is no meaningful relationship between the prevalence of musculoskeletal disorders and work experience. The findings also showed that there was no significant

relationship between the prevalence of musculoskeletal disorders in shoulder and elbow area and working with computers.

Based on the findings of this study, there is high musculoskeletal disorders in the study population. Due to the importance of these disorders in reducing the productivity of employees, preventing or reducing these disorders is very important. For this purpose, identification of injured and susceptible people for developing musculoskeletal disorders, encouraging and educating employees to adapt themselves when the appropriate conditions of the work environment are not provided, observation of ergonomic principles, risk identification and reduction of their harmful effects are recommended.

Conclusion

The results of this study revealed a high incidence of musculoskeletal disorders in the studied population. Gender and body mass index were identified as meaningful variables related to disorders.

Acknowledgements

None.

Ethical consideration

The study protocol has been approved by Ethical review Board of Guilan University of Medical Science, Rasht, Iran. Ethical code number: IR.GUMS.REC.1395.380.

Conflicts of interests

Authors declared no conflict of interest.

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