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Determining the Prevalence of Musculoskeletal Disorders in Tailors in Kermanshah, Iran Using the Nordic Questionnaire (2018)

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Abstract

Background: Given that evaluating and diagnosing musculoskeletal disorders (MSDs) is an important step towards preventing labor disorders, The present study was conducted to determine the degree of MSDs in tailors in the city of Kermanshah, Iran.
Methods: The present descriptive, analytical and cross-sectional study was conducted in winter 2018 on 150 randomly-selected tailors in the city of Kermanshah. The status of neck, waist, shoulder, wrist, ankle, hip, knee and elbow was evaluated using the Nordic questionnaire. The data collected were analyzed in SPSS using Spearman's correlation coefficient.
Results: The mean age of the tailors was 41.9 $\pm$ 13.1 years. A total of 59.33 % of the tailors were male, and the men and women were significantly different in terms of MSDs ($P < 0.05$). A weekly study reported neck, shoulder, waist, wrists, elbows, thighs, knees and ankles disorders to involve 49.7%, 41.6%, 55%, 40%, 11.4%, 25%, 43.6% and 42.66% of the tailors, respectively. The most prevalent injuries recorded in an annual examination were respectively associated with the waist (65.33%), neck (64.66%) and shoulder (56%). In the previous year, 52% of the samples had suffered from pain and discomfort in at least one of the eight areas cited.
Conclusions: The results of the present study found marital status, working hours and exercise to be the most significant variables affecting MSDs in the tailors. MSDs were found to be highly prevalent in especially the upper extremity of the sewing profession population. Optimizing the working condition of tailors is therefore crucial.

Keywords: MSDs, Tailors, Nordic Questionnaire, Kermanshah

1. Background

Musculoskeletal disorders (MSDs) are considered one of the most important occupational injuries in developing countries (1). Despite the increasing development of industries, these types of disorders are the most important factors contributing to the injuries of manpower, the early depression of people, the waste of working time, increasing medical costs and reducing quality of work (2, 3). This issue is so important that the World Health Organization called the 2000s the decade of preventing MSDs (4). Factors such as undesirable body condition, force, vibration, speed of work, uniformity, repetitive tasks, undesirable lighting and low temperatures are associated with MSDs, which involve the injury of muscles, nerves and tendons (5-7). Research suggests that demographic and psychological factors affect the emergence of MSDs. A large percentage of workers, i.e. 45% - 95%, are reported to be employed in small workshops in developing countries (8). According to the Iranian Ministry of Health and Medical Education, about 96% of industries are small and involve about 85% of the workforce in the country (9). Unfortunately, despite the high prevalence of MSDs in small industries, workers in this sector are generally deprived of professional health services, which is cause of many injuries in human resources. Sewing is a small industry in Iran, in which workers perform repeated movements such as moving objects and tools, and tend to sit for a long time and repeat similar movements involving especially the upper extremity (10). Sewing is normally associated with a stationary position of the head and trunk, causing MSDs especially in the hands, neck and wrists (11).

2. Objectives

The present study was therefore conducted to determine the status of MSDs and the pain of the neck, shoulders, wrists, ankles, waist, elbows, knees and thighs and its relationship with gender, age, working hours, marital sta-

tus, type of activity, amount of activity and doing exercises in tailors in the city of Kermanshah.

3. Methods

The present descriptive, analytical and cross-sectional study was performed in winter 2018 on 150 tailors in Kermanshah, in the west of Iran. The sample size was determined using Morgan table (12), and the samples were selected using simple random sampling with a confidence interval of 95%. The exclusion criteria comprised having diseases involving the musculoskeletal system, having musculoskeletal injuries or having a second occupation. The data collection tools consisted of the Nordic questionnaire, which was successfully used in Poland (13), Italy (14), Japan (15), Greece (16), Turkey (17) and Iran (18).

The questionnaire consists of two parts: (a) A general questionnaire and (b) a specific questionnaire. The general questionnaire includes a general survey, in which signs of generalized disorders are investigated. The specific questionnaire analyzes these symptoms in particular areas of the body such as the lumbar region, neck and shoulders.

This questionnaire was selected as a package and concerns MSD symptoms in the neck, waist, shoulder, wrist, ankle, hip, knee and elbow. The items are responded by Yes/No, and the appraisal period is one week and one year.

These anatomical regions were selected based on two criteria: (a) The organs where the symptoms were concentrated and (b) the organs that could be identified by both the respondent and the investigator.

The questionnaire contains items on variables such as age, gender, marital status, working hours, type of activity and appropriate exercises. The investigator provided the tailors with the required explanations before they began completing the questionnaire. Content validation method was used to confirm the content validity of the data collection tool. The reliability of the questionnaire was confirmed in a preliminary study by distributing the original questionnaire among 25% of eligible individuals and calculating a Cronbach alpha of 85% (19). The collected were analyzed in SPSS-20 (SPSS Chicago, IL, USA) with a 95% confidence interval.

4. Results

Table 1 present the demographic status of the samples. A total of 61 (40.66%) of the tailors were female. The mean age of the samples was 41.9 $\pm$ 13.1 years. Most of the tailors (64%) worked more than 10 hours a day and 70.66% were married. According to the findings, 79.33% of the participants were in a sitting and standing position, and 70% did not do any proper exercises. MSDs were found to mostly involve pains in the waist of 65.1% of the participants and neck of 64.4%. The lowest frequency of complaints was associated to elbow pains (12% of the samples). Pains in the shoulder were observed in 56% of the cases, wrist in 53.33%, knee in 55.33%, ankle in 49.33% and thigh in 31.33% (Table 2). Moreover, statistical test results associated the emergence of MSDs in different organs of the body to certain individual factors; for instance, given that ankle and knee disorders are more prevalent in males and married individuals than in women and singles ($P < 0.05$), the associated pains vary with gender and marital status. Furthermore, waist and ankle pains were more prevalent in subjects with more-than-ten working hours ($P < 0.05$). Neck and elbow pains were also less frequent in tailors who did regular exercise during the day ($P < 0.05$). According to the results, no significant relationships were observed between age and pain in the eight study areas ($P > 0.05$). The correlation of type of activity and hip fractures was found to be significant, whereas the correlation with other organs was insignificant. In fact, hip pains were more common in the subjects with sitting and standing activities than in those with other types of activity ($P < 0.05$). The study of the prevalence of MSDs in the samples showed that 52% of the tailors reported at least one symptom of MSDs in the workplace in the previous year. The weekly survey found this prevalence to equal 78.67%, and the pain of the waist and neck to be respectively the most frequent complaints.

5. Discussion

The prevalence of MSDs was found to be respectively higher in the waist, neck and shoulders, compared to in other organs. Jalali and Nasl (20) studied MSDs in the workers of the sewing profession using the Nordic questionnaire and found the prevalence of disorders involving the shoulders, elbows and wrists to be 20.3%, 10.2% and 42.4%, respectively, all of which are below the figures reported in the present study. This discrepancy of results can be explained by the higher mean age of the present study population, which causes more frequent MSDs. Osteoporosis, bone burnout and traumatic accumulation increase and the stimulation of tendons and muscles decreases with age (21). The present study found no significant correlations between age and the prevalence of MSDs, which is consistent with the research conducted by Kausto et al. (22) using the Nordic questionnaire. The difference of ankle and knee pains with gender was found to be significant, which is consistent with the results of the study conducted by Aghili et al. (23) using the Nordic questionnaire. In general, sewing activities are mostly performed with bending back and neck, while some parts of the body are mostly in

Table 1. Frequency Distribution of Some Demographic Characteristics and Job Condition in the Studied Samples

Parameters/Definition	Frequency (%)
Age mean, y	41.9 ± 13.1
Gender	
Male	89 (59.33)
Female	61 (40.66)
Marital status	
Married	106 (70.66)
Single	44 (29.33)
Type of activity	
Sitting	18 (12)
Standing	13 (8.66)
Sitting/standing	119 (79.33)
Working hours	
8 hours	54 (36)
> 10 hours	96 (64)
Exercise	
Yes	45 (30)
No	105 (70)

Table 2. The Prevalence of Musculoskeletal Disorders in the Studied Tailors (n = 150)

Region Body	Frequency in Time Periods (%)	
	12 Month	7 Days
Neck	100 (64.66)	75 (49.7)
Shoulder	84 (56)	63 (41.6)
Waist	98 (65.33)	83 (55)
Wrists	80 (53.33)	60 (40)
Elbows	18 (12)	17 (11.4)
Thighs	47 (31.33)	38 (25)
Knees	83 (55.33)	65 (43.6)
Ankles	74 (49.33)	64 (42.66)

a sedentary position. The present study found the prevalence of MSDs to be the highest in the neck and waist potentially due to prolonged neck activities, lack of rest and uninterrupted work (24). Shoulder MSDs may be caused by the stationary status of the shoulder. The accumulation of lactic acid in this part reduces muscle contractions and causes circulatory disturbances and ultimately early fatigue in shoulder muscles (25). Waersted and Westgaard showed that prolonged working hours are a risk factor for these disorders in different areas of the body in industrial sewers (26). In line with the present study, Jabari et al. used the Nordic questionnaire and found the waist (55%) to be the most common organ involved in MSDs (27). The study conducted by Öztürk and Esin (28) in Turkey in 2011 using the Nordic questionnaire found the most prevalent symptoms to be associated with the trunk, neck and shoulder, which is consistent with the present findings. Highly prevalent low back pains suggest an inappropriate physical condition during work, which should be considered more closely when modifying methods and training employees. The reason for this, however, appears to be owing to the type of work (2). One way of reducing the frequency of these abnormalities is to reduce the frequency of physical activities and include short rest intervals. The majority of the study tailors were about 40 years old, male and married. Non-ergonomic conditions of the work environment and incorrect conditions of the body during the work had caused high levels of MSDs. The discrepancy of results observed in different studies can be explained by the differences in factors such as age range, gender, sample size and work experience (29, 30). Corrective measures are therefore required to lower the high risk associated with these disorders.

5.1. Conclusions

The obtained results suggest that tailoring can be considered a high-risk occupation for MSDs. Given that the prevalence of MSDs was the highest in the waist and neck, respectively, the general health is recommended to be promoted in tailors by paying a special attention to this group and providing proper chairs and tables for improving posture. Learning the correct way of working and changing behavioral patterns are also crucial. Tailors' work schedule is recommended to include exercise to increase their muscle strength and physical endurance and reduce the stress on their musculoskeletal system.

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