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Musculoskeletal Disorders and Associated Factors in the Students of Tarbiat Modarres University Dormitory in 2016

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Background: Studies indicate that Muscularskeletal Disorders (MSD) are among the first ranks in terms of economic and healthcare cost of which back pain is in the first place.

Methods and Materials: This study was a cross-sectional study. The study participants were 100 students who were studying at the Tarbiat Modares University in the year of 2016. Data on back pain was collected via the standardized Quebec questionnaire. Quebec questionnaire contains 20 questions with 6 options by which pain intensity is ranked between 0 and 100. Collected data was analyzed using SPSS software version 16. In order to determine the status of musculoskeletal disorders and associated factors, descriptive statistics and chi-square test were used.

Results: Totally 100 students who living in Tarbiat Modares University with mean age of 26.1 ± 3.1 were participated in the study. According to the results, 84% of the students (N = 84) were single, 15% (N = 15) were married, and 1% of the students (N = 1) was divorced. Eighty seven percent of the students (N = 87) were studying in Master degree and 10% of the students (N = 10) were studying in PhD degree. The majority of the students (60%, N = 60) did not report any musculoskeletal pain. However, forty students (40%) suffering from MSD.

Conclusion: This study was designed to investigate the musculoskeletal disorders among the students. As this study revealed a high percentage of the students were suffering from a kind of MSD, designing more researches to confirm these findings and also to design proper preventive intervention are strongly recommended.

Keywords: Musculoskeletal Disorders (MSD), Students, University, Iran

Introduction

The growing development of new technologies has increased the activities in human life along with the increase in the production and productivity. On the other hand, this development has accompanied with some side effects including inactivity, fatigue, neuro-psychological pressures and increased incidence of Musculoskeletal Disorders (MSD) for humans (Mirmohammadi et al., 2010). Close to 48% of all work-related diseases and disorders are made up of MSD. Studies indicate that MSD are among the first rank in terms of economic and healthcare cost making backaches in the first place (Ariëns et al., 2001). It has been proven that the pain in the shoulder, neck, and face are caused by heavy lifting work even greater than light work. In recent years, the use of laptops among people, especially students has been increased due to laptop portability and light weight; but users tend to take improper postures while using it. Physical postures, such as lying on the floor, and placing laptop on the improper objects would cause pressure and discomfort in long term, causing irreversible chronic disorders. Given that the students spend many hours in studying, it is not unexpected that most of them experience musculoskeletal symptoms due to their fixed positions. Furthermore, because of its lightness and smallness, laptop can be used in any position and posture regardless of ergonomic principles.

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Skeletal disorders are the most common and most expensive occupational injuries (Feyer et al., 2000). These disorders are the leading cause of work-related injuries and disability in developed and developing countries (Choobineh et al., 2004). Studies show that more than half of the absences in workplace are due to musculoskeletal disorders. A recent report by the US Census Bureau shows that skeletal-muscle disorders account for 44% of the compensation for work-related injuries and costs of about 45 to 54 million dollars per year (Denis, St-Vincent, Imbeau, & Nastasia, 2008). One of the jobs that are accompanied with musculoskeletal problems is work with computers.

Musculoskeletal Disorders (MSDs) are one of the major causes of disability in occupational injuries in developed and developing countries (Maul et al., 2003). MSD has increased the costs of wages, medical expenses, loss of productivity, and poor quality of life. Every year, nearly one million people take time off for treatment and recovery from musculoskeletal disorders. In America in 2001, the economic decline associated with work-related MSD was estimated to be about $ 45-54 billion (Rowshani et al., 2012). Among the all reports of occupational diseases, 42% were related to the musculoskeletal system. In the past two years, a significant increase (30%) was observed in this figure (Rowshani et al., 2012).

Musculoskeletal disorders are as a result of excessive biomechanical load. They are considered as one of the major causes of disability and absenteeism, and play a significant economic and social role. Risk factors of these disorders are multifactorial which have not yet completely been discovered in some cases. These disorders are caused through the interaction of various risk factors which are multifactorial. The individual risk factors are divided in three main groups of psycho-social and physical factors. Among the physical risk factors, work load, body posture, repetitive activities, severe static muscle, mechanical stress, vibration, and cold are the most common ones. Wherever the acts of excessive force, improper body postures, repetitions of movements, and less time to rest are present, they would eventually lead to these disorders. Musculoskeletal disorders impose heavy costs not only on people but also on trade and national economy. By evaluating the work tasks and reviewing the effectiveness of the preventive measures, it is possible to reduce the incidence of these disorders.

Skeletal disorders are usually caused by long-term or repeated muscle pressure on the soft tissues of the human body such as nerves, muscles, tendons and joints. Skeletal disorders related to muscle work are the most important concern for public health and lead to temporary or permanent disability (Merlino et al., 2003). The cause of musculoskeletal disorders is complex, and includes ergonomic, individual, and social psychological factors (van Boxtel et al., 2007). Physical activity (exercise) of any type, fitness, and wellness can maintain overall health improvement. Exercise is effective in maintaining physical fitness, a healthy weight, bone density, muscle strength, and joint mobility. It is also effective in promoting physiological well-being and positive help to strengthen the immune system. Previous studies showed that physical activities (exercise regularly) reduce the risk of musculoskeletal disorders (Genaidy et al., 1992). Quality of life is an important indicator for the tolerance of muscular skeletal disorders. In a study conducted on the efficacy of musculoskeletal disorders prevention program on the quality of life, it was shown that programs designed for skeletal muscle disorders prevention lead to enhancing the quality of life (Santos et al., 2011). Several studies showed that musculoskeletal disorders reduce quality of life (Salaffi et al., 2005). In previous studies, the impact of physical activity and regular exercise reducing musculoskeletal disorder was shown (Hildebrandt et al., 2000).

Musculoskeletal disorders alone impose the greatest economic loss (40%) to countries among other injuries and work-related diseases. Furthermore, statistics show that the number of cases of musculoskeletal disorders has risen dramatically since 1980. According to previous studies, various factors such as repetitive movements, vibration, posture, age, sex, and physical fitness can be effective on the severity of injury (David et al., 2008); among which the most important one is improper postures. Helping to lift and move a patient, doing things that need to bend in long-term extracurricular activities are among the activities noncompliant with work safety and labor welfare, which play an important role in affecting physical and psychological disorders (Munabi et al., 2014). Statistics show that almost one-fourth of people are suffering from work-related physical pains, and one out of every three people is suffering from low back pain related to work (Bernal et al., 2015). Given the prevalence and importance of MSD, this study aimed to

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explore the status of MSD among the students living in dimities of Tarbiat Modares University.

Methods and Materials

This study was a cross-sectional study. The study recruited participants were 100 students who were studying at the Tarbiat Modarres University in the year of 2016. The questionnaire consisted of items about demographic characteristics, skeletal problems-muscle pain and Visual Analogue Scale (VAS) line. The students were ranked according to the degree of their pain. If the rank was zero, the students were identified as in good health with no pain. If the rank was between 25-50 they were identified with moderate pain. If the rating was about 50-75, they were considered as a lot pain and the rate between75-100 were considered as too much (severe) pain. Data were analyzed using SPSS software version 16. Descriptive statistics and chi-square test were used in order to determine the status of MSD and its associated factors.

Results

The results of this study showed that the average age of the students was 26.1 ± 3.1. According to the results, 84% (N = 84) of the students were single, 15% (N = 15) were married, and 1% (N = 1) was divorced. Sixty percent of the students (N = 60) did not report any MSD, and only 40% (N = 40) had MSD.

Of all students who reported MSD (100%, N = 40), all students were suffering from low back pain with different intensity, Table 1 shows the intensity degree of low back pain among the students. However, some students reported neck pain (18%, N = 18), heel pain (8%, N = 8), pelvic pain (2%, N = 2), finger pain (3%, N = 3) and elbow pain (1%, N = 1).

Table 1. The frequency of back pain among the students.
Back Pain

Severity	(N = 99)	(%)
No problem	60	60.6
Average	29	29.3
A lot	8	8.1
Too much	2	2.0
Total	99	100.0

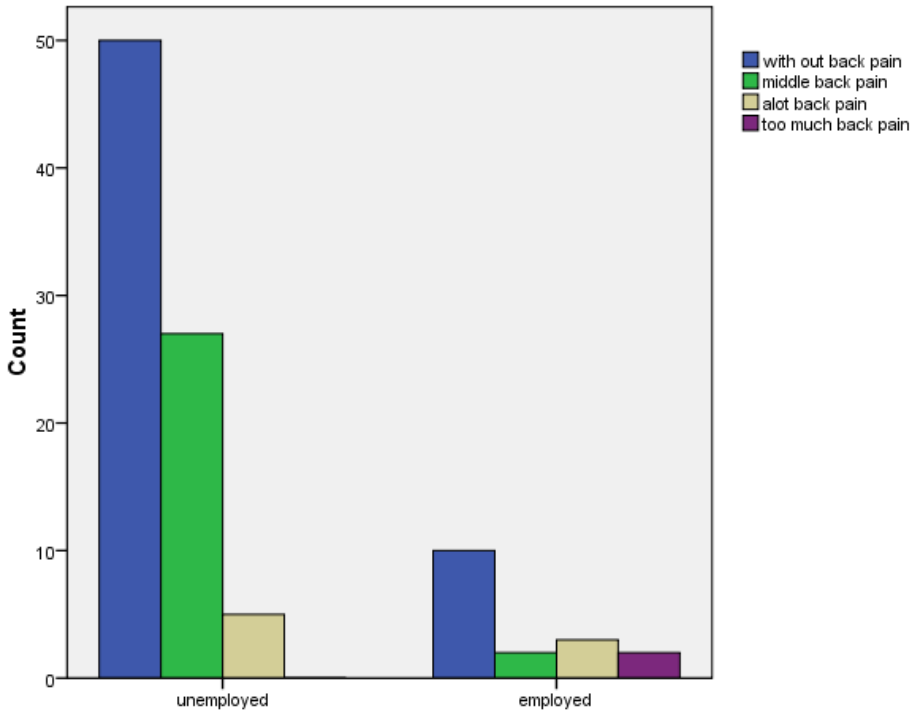

Figure 1. Back pain severity in terms of participants' jobs.

To investigate factors associated with low back pain, Chi-square test was used which showed variables such as employment status, income, and medical diagnostic had a significant correlation with low back pain ($P < 0.05$). According to the this result, most employed students (9%, N = 9) and unemployed students (49%, N = 49). As this figure shows, there was no unemployed students with sever low back pain, but 2% of employed students (N = 2) suffered from severe low back pain.

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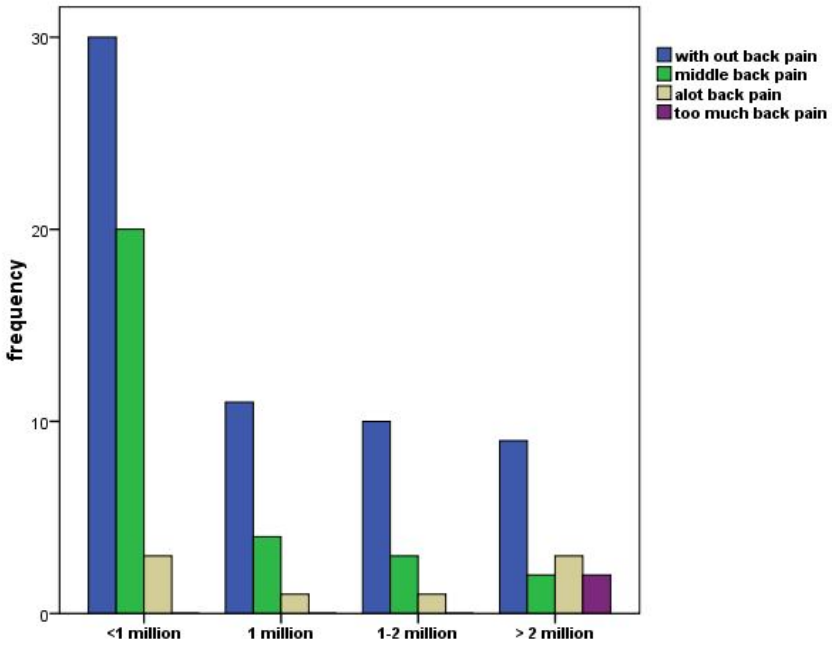

Figure 2. Back pain severity in terms of income.

Figure 2 shows the frequency rate of students with or without low back pain in terms of their income. According this figure, the majority of the studied students (29%, N = 29) who have reported no pain were categorized in low income. Chi-square test results showed a significant direct relationship between income variable and low back pain ($P < 05$).

Figure 3 shows the frequency rate of students with or without low back pain in terms of their medical diagnosis, According this figure, the majority of students (55%, N = 55) who were without physician visit/ diagnosis were reported no low back pain and the rest of students (34%, N = 34) who suffering from low back pain with different intensity from mild to severe verified that they have not visited any physician regarding their pain. Of the students with low back pain, the most students (4%, N = 4) were without physician visit/ diagnosis. Chi-square test showed a significant relationship between the variables of medical visit/diagnosis and low back pain reporting ($P < .05$).

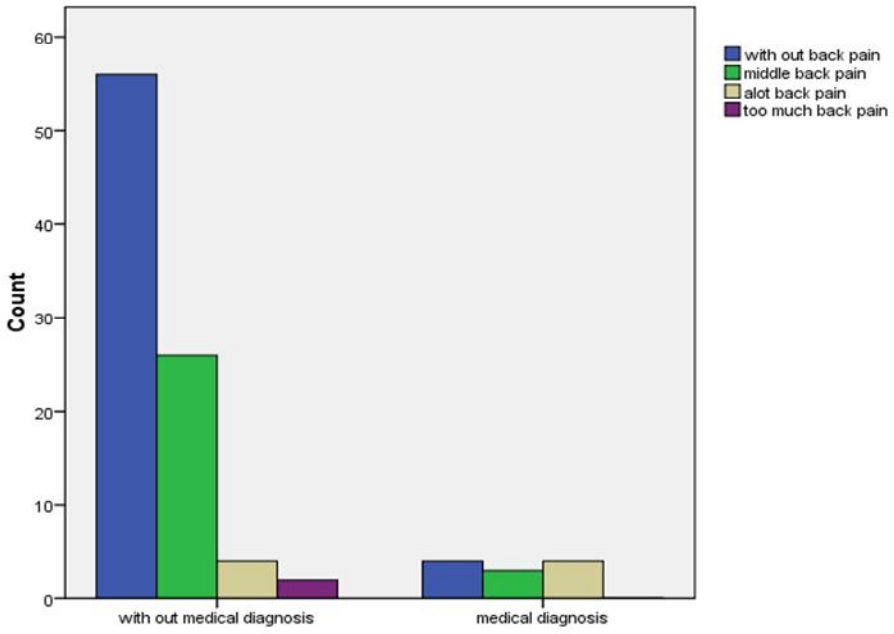

Figure 3. Back pain severity in terms of medical diagnosis.

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Discussion

This study assessed the status of MSD among the students studying in Tarbiat Modares University and living in the dormitories of this university. The findings of this study showed the students' age group was between 22-30 years old.. Although all the students were in young age group, about near half of them were suffering from a kind of MSD mostly low back pain. As all the students in Tarbiat Modares University were studying in post graduated level and they had to do work with laptop/ computer for most of their time, it seems the probably wrong ergonomically position while working resulted in low back pain and other MSD. Saito (1997) reported while using a laptop or desktop computers, the load on the neck/ back muscles (muscle electrical activity level values) was significantly higher than the other times (Saito et al., 1997). In a study conducted in 2005 by Harris Kortnay, 10 to 17-year-old children of South Australian schools, who used laptops were studied to assess their physical ergonomic position. This researcher found that the physical postures of laptop users' were varied based on their location such as home, school and elsewhere and the majority of the students reported disconformity when carried their laptop.

In present study the factors associated with low back pain were assessed. The findings showed only variables like employment, income, and medical visit/ diagnostic had a significant correlation with low back pain while other variables were not significantly correlated. Moreover, there was a significant relationship between the variables of employing and back pain. However, most people without back pain were both employed and unemployed.

Chi-square test results showed a significant relationship between status of income variable and low back pain. According this finding the students who were high income were more probably to suffer from low back pain. It seems who were high income, might be more inactive than the others. However in this study the causes of these significant relationships were not assessed. Thus, doing more researches in this regards in future, strongly recommended. In current study, the chi-square test showed a significant relationship between the variables of medical diagnostic and low back pain. This means that the students who were suffering from low back pain were more likely to visit the physician than others. However, Iranian individuals used to visit physician while the voice of their bodies were heard. They usually visit physician for treatment not for health problem prevention.

This study was designed to investigate the status of skeletal deformities among the students. It seems that computer is an important tool for a student who spends hours and weeks for educational guidelines along with learning and research activities. Lack of attention to ergonomic principles and long-term sitting position when working with computers may be associated with the incidence of diseases and abnormalities in individuals (Rowshani, et al. 2012) Especially in developing countries, evidence suggests that the lack of fit between technology and the communities' user education due to lack of readiness in an environment where technology is used, produces negative results such as the low quantity and quality of production and high rate of work injuries and accidents. Many of these problems can be eliminated or at least reduced by resorting to methods related to "ergonomic" in the workplace (Amick et al., 2003). One of the most important results of this article is related to the back pain in employed students. Today, human societies have shown better compatibility with the social environment, and there is a need for balance between a person's physical and psychosocial fitness (Foyer et al., 2001). Having a high level of health indicators, and physical function may indicate high health indicators of the societies. In Industrialized developing countries, it seems that muscle pain is resulted from improper diet and inadequate physical activity, and also unhealthy life style. Therefore, the best and simplest way is to encourage regular exercise three times a week for at least twenty minutes at each time.

Despite strong points of this study that made its' results to be similar with the other valid studies, there were some limitations for this research. One of the limitations is being self-reporting that might be encounter with the obtained results. This study was done just on 100 students studying in Tarbiat Modares University. It suggested the future studies will be done among larger samples who be recruited from different universities.

Conclusion

This study was designed to investigate the musculoskeletal disorders among the students. As

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this study revealed a high percentage of the students were suffering from a kind of MSD, designing more researches to confirm these findings and also to design proper preventive intervention are strongly recommended.

Conflict of Interest

There is no conflict of interest for this article.

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Authors ' contribution

EF, FH, MD**:** Study Importation, data collection and analysis, writing the first draft of the paper.

EF, FH, MD: Study design and data analysis, editing and confirming the final draft of the paper.

EF, F H, MD: Study design, confirming the final draft of the paper **.**

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