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Prevalence of Musculoskeletal Disorders among Sewing Machine Workers in a Leather Industry

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Background: Musculoskeletal disorders are the group of disorders which affects the muscles, tendons, ligaments, joints, peripheral nerves and supporting blood vessels in the body. Sewing machine involves continuous, repetitive tasks like cutting, assembly, pressing and finishing. These works are performed in a sitting posture with upper back curved forwards and the head is bent towards the sewing machine. Working in this faulty posture for a long time increases the chance of developing work related musculoskeletal disorder among them. The objective of study is prevalence of musculoskeletal complaints among sewing machine workers in leather industry.

Methods: A non- experimental study with 100 subjects according to inclusion and exclusion criteria. Using the NORDIC QUESTIONNAIRE musculoskeletal pain have been analysed.

Results: The statistical analysis of this study show 88% of sewing machine workers had a lower back pain in the last 12 months, 82% sewing machine workers had a lower back and knee pain that has been prevented them over last 12 months during normal activity, 86% sewing machine workers had lower back pain in the last 7 days.

Conclusion: This study concluded that the 86% experienced low back pain, 84% experienced knee pain and 74% of experienced neck pain in past 7 days. 88% of experienced low back pain, 86% experienced knee pain, 76% experienced neck pain in past 12 months.82% experienced pain in lower back and knee pain and 72% experienced neck pain among sewing machine manual workers that has impacted over last 12 months during normal activity.

Key Words: Work related musculoskeletal disorder, NORDIC questionnaire

INTRODUCTION

Musculoskeletal disorders are the second commonest cause for disability worldwide. It also results in increased absenteeism from work and decreased salary wages for employers and the health care system. The disability rates caused due to chronic musculoskeletal disorders increased by 45% between 1990 to 2010, and this may further increase in the future [1,2]. The term musculoskeletal disorders indicate pains or aches in the musculoskeletal body system such as muscles, joints, ligaments or tendons. The cognitive and psychosocial factors are also associated with musculoskeletal disorders [3].

The Musculoskeletal pain rate influences the people in the society in a huge number. The symptoms of the musculoskeletal pain will create awareness among workers about their rate of pain, quality of pain, for goodness in work participation and also to their financial problems. In muscu-

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loskeletal disorders the hazards are classified in to three categories such as biomechanical hazards, additional hazards and individual hazards [4]. The biomechanical hazards consists of high force, repetition and awkward posture, additional hazards consists of vibration, temperature and contact stress and the individual hazards occurs by age, body size, previous injury, genetic predisposition. Musculoskeletal disorders which also has an impact on socio-economic status. People may suffer the financial loss of the individual, their family and the community. It may also cause psychological disturbances [5].

In India the low back injuries being the major cause of morbidity in the musculoskeletal disorders generally affecting 75-80% of the Indian population. This increases by 0.9% every year since 1990 and is increased by 20.5%. The musculoskeletal disorder for men peaks at the age of 55-59 years and lowest of 10-14 years of age [6]. The musculoskeletal disorder for women peaks at the age of 75-79 years and lowest is of 10-14 years of age. Overall prevalence of MS pain was found to be 25.9%. Pain was found to be more frequent among females (31.3%) as compared with males (20.9%). These risk factors contributed to and were thought to be responsible for an estimated 19.9% of the total harm caused by musculoskeletal disorders in India by 2013 [7].

The main hazards for sewing machine workers are needle and driving mechanism. Long line mechanism driving the foot. Long drive mechanism injury to the hip, knee and especially in ankle. In ankle it may twisted to lateral ligament injury [8-10].

Work posture of the sewing machine workers caused out the dangerous complications in physical and mental which is reflected by the gait analysis and physical activity. Awareness of these problems in one hand the disturbances in health and other hand such as financial losses, surroundings, family and community in turn. In shoe manufacturing industry has high prevalence of musculoskeletal disorder because workers in that industry perform sewing work for all the time, doing such work without any principle cause out the irreversible damage to the body [11].

The main aspect of this study is to find out the work related musculoskeletal disorders in a workers operating sewing machine in a leather industry. Stitching a leather shoe through manually operating in a sewing machine is a much difficult job compare to stitching a normal cloth through a manual sewing machine [12].

The aim of the study is to investigate the prevalence of musculoskeletal complaints among sewing machine workers in a leather industry.

It is a prime important to have the awareness of work sitting in order to understand and its causes for musculoskeletal disorders among sewing machine workers. There were various studies on conducted on garment industry, the present study is on leather industry workers.

MATERIALS AND METHODS

The study design was non experimental design and the study type was observational type. 100 subjects were chosen based on the inclusion and exclusion criteria. The study setting was done in Chennai by selecting three shoe companies, covering the study sample size. Their age was 25 to 40, working experiences were more than 2 years, worked minimum 8 hours in a day as manual type of sewing machine workers. Participants who are willing to participate in were included in the study. Recent injury, diabetes mellitus, recent fracture and any fixed deformities were excluded in the study.

The subjects were selected based upon the inclusion and exclusion criteria. Their name, age, sex, occupation, address, height, weight, are been noted in the assessment. The consent form should be explained in the subjects and acceptance was obtained.

Subjects are explained with about the Nordic questionnaire and the importance of it. The subjects have to fill with true marking and response to encourage obtained response is documented for statistical analysis. The questionnaire is to be filled by subjects. The questionnaire consists of three questions for evaluating trouble with the locomotive organs. The whole body is divided in to nine regions. They are neck, shoulder, elbow, wrist/hand, upper back, lower back, hip/thigh, knee, and ankle/foot.

In shoulders, elbow, wrist/hand it contains right, left and both. The questionnaire can fill by the following criteria such as;

1. Have you at any time during last 12 months?

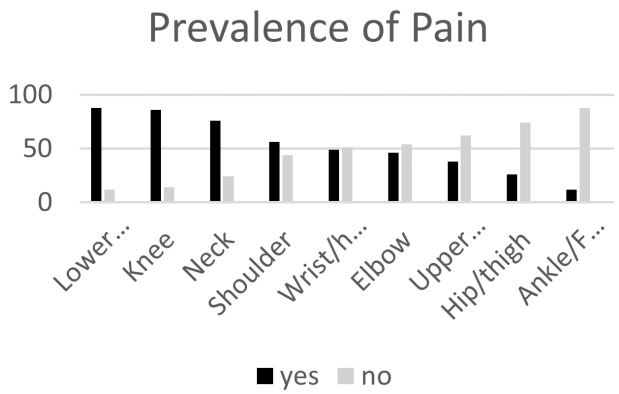

Fig. 1. The prevalence of pain in upper back, knee, neck, shoulder, wrist/hand, elbow, upper back, hip/thigh and ankle/foot region among sewing machine workers in the last 12 months.

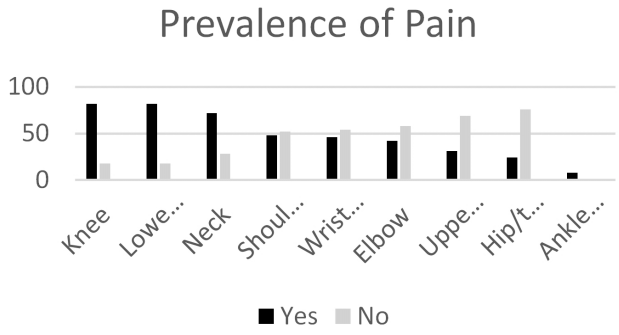

Fig. 2. The prevalence of pain in knee, lower back, neck, shoulder, wrist/hand, elbow, upper back, hip/thigh and ankle/foot region among sewing machine workers which prevented them last 12 months from normal activity in home or away from home.

had trouble (ache, pain, discomfort, numbness) in?

2. Have you at any times during the last 12 months been prevented from doing your work (at home or away from home) because of the trouble?

3. Have you trouble at any time during the last 7 days?

This is the observational study to find out the prevalence of musculoskeletal disorder among sewing machine workers in leather industry. The statically analysis was done by using statically package for social science IIBM (SPSS) version 22.

RESULTS

Fig. 1 shows the prevalence in 88% suffered from lower back pain, 86% suffered from knee pain, 76% suffered from neck pain, 56% suffered from shoulder pain, 49% suffered from wrist/hand pain, 46% suffered from elbow pain, 38% suffered from upper back pain, 26% suffered from hip/thigh pain and 12% suffered from ankle/foot pain region among sewing machine workers in the last 12 months.

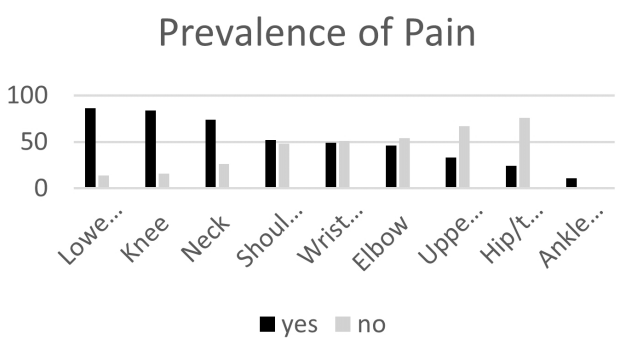

Fig. 3. The prevalence of pain in lower back, knee, neck, shoulder, wrist/hand, elbow, upper back, hip/thigh, ankle/foot region among sewing machine workers in last 7 days.

Fig. 2 shows the prevalence in 82% suffered from knee pain, 82% suffered from lower back pain, 72% suffered from neck pain, 48% suffered from shoulder pain, 46% suffered from wrist/hand pain, 42% suffered from elbow pain, 31% suffered from upper back pain, 24% suffered from hip/thigh pain and 8% suffered from ankle/foot pain region among sewing machine worker which prevented them last 12 months from normal activity in home or away from home.

Fig. 3 shows the prevalence in 86% are suffered from lower back pain, 84% suffered from knee pain, 74% suffered from neck pain, 52% suffered from shoulder pain, 49% suffered from wrist/hand pain, 46 % suffered from elbow pain, 33% suffered from upper back pain, 24% suffered from hip/thigh pain and 11% suffered from ankle/foot pain region among sewing machine workers in last 7 days.

DISCUSSION

The objective of the study is to analyse the risk factor contributing in the musculoskeletal disorders among sewing machine workers in leather industry. According to the many studies they are proved that musculoskeletal disorders are very prone to industrial workers. They are very less study

are available. It shows very low concentrate in experience and working hours. Hence this study which done based on work experiences and hours there were working in leather industry.

In this study 250 participants are taken in and they are screened. These 100 participants were selected based on inclusion criteria, (such as manual type of sewing machine workers age is from 26-40 and working 8 hours in a day). Some participants are excluded by recent injury, diabetes mellitus (with or without medication), recent fracture and any fixed deformities. The informed consent form was given to the participants.

In this study about 88% of sewing manual machine workers gave a history of lower back pain in the last 12 months which was highly reported discomfort, second most common problem is knee pain which is of 86% and third most common problem is among neck region which is of 76% [13]. Some studies go in hand with the results were lower back region is commonly affected, and the risk factor is due to improper sitting on the chair while working leads to musculoskeletal disorder among sewing machine operators [14].

The elbow and wrist are common affected on sewing machine workers, but he concentrated on only upper limb, but this study shows musculoskeletal disorder occurs mostly at the lower back, knee, and neck region [15]. About 82% of sewing machine workers gave a history of knee pain and lower back pain has impacted over last 12 months from doing normal activity. Second most common problem is neck region of 72%.

Awkward posture of neck and back, continuous movements of arm, long working hours also leads to risk factor for musculoskeletal disorder [16].

The duration of pain which persisted for about a weeks period, the lower back pain was 86% and knee pain was about 84%: and 74% of neck pain was reported among the sewing machine workers. But when upper limb is compared to lower limb, there is less risk factor shown in upper limb. This may be due to sewing machine workers have high level of impact on their lower limb.

Increasing of age, years of working experience, working hours in a day, and continuous work without taking any rest are increased for the risk of musculoskeletal disorder [16].

There is a study state that the duration of work, the ergonomic factors such as force and repetitiveness play an important role in musculoskeletal disorder and which showed that work experiences and duration of work may cause high level of musculoskeletal disorders.

A major health issue found in general population is musculoskeletal disorder which directly affects the quality of life and has a heavy demand on health care organization. In prolong sitting in flexed spine posture constant ankle and foot movements could be expected among these workers during working hours.

According to some authors, poor working positions there is high level of pain in neck and upper extremities and pain is related to the prolong exposures of work.

Due to this discomfort occurs some rest can be given in between known as 20:20 rule. In every 20 minutes gap 20 seconds interval has been given such as by changing position like neck rotation, walking in and around the area.

Limitation of the study includes only Nordic questionnaire was used, BMI was not measured, Quality of life was not considered, and Psychological aspects are not considered. Interventions can be given, Physical activity questionnaire can be included, Differences in discomforts between male and female sewing machine workers can be documented, Difference in years of experience can be planned for further studies, In future manual and mechanical type of sewing machine workers can be compare.

CONCLUSION

This study concluded that 88% had experienced low back pain during last 12 months suffered from 82% had low back pain which has prevented them from during normal activity from the last 12 months and 86% had experienced lower back pain in the last 7 days.

CONFLICTS OF INTERESTS

None to declare.

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