Indian Journal of Physiotherapy and Occupational Therapy
Volume 18 No. 1, January-March 2024

Risk Assessment Of Work-Related Musculoskeletal Disorders Among Tailors In Vadodara City

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How to cite this article: Shah SM, Joshi RK. Risk Assessment of Work-Related Musculoskeletal Disorders Among Tailors in Vadodara City . 2024;18(1):90-95.

ABSTRACT

Background: Musculoskeletal disorders have become more in recent decades. Primary causes being job environment and working conditions. Musculoskeletal disorders can be defined by the impairment of bodily structures and localized blood circulation caused primarily due to work or work environment. The tailoring industry of India is an unorganized sector and majority employees are from lower economic class. Hence despite of discomfort in working due to awkward posture and repetitive stress injury they are compelled to work bearing the unfavourable circumstances.

Objectives: 1) To see the prevalence of risk of work-related musculoskeletal disorders in tailors by using Cornell Musculoskeletal Discomfort Questionnaire. 2) To see the prevalence of risk of work-related musculoskeletal disorders in tailors by using REBA.

Method: A descriptive community based cross sectional study was conducted in Vadodara city, Gujarat from December 2022 to May 2023. 50 tailors were taken as subjects for the study according to inclusion and exclusion criteria from Vadodara city. Tailors were chosen by convenient and purposive sampling and were interviewed and assessed by approaching them at their work place and CMDQ and REBA scales were filled.

Results: As per statistical analysis 14% were suffering from mild discomfort, 54% were suffering from moderate discomfort, whereas 32% complained of severe discomfort.

Conclusion: A multidirectional approach including appropriate technique in terms of operators, posture and ergonomically sound workstation are required to avoid debilitating effects of musculoskeletal disorders among the workers.

Keywords: Musculoskeletal Disorders, Tailors , REBA, CMDQ.

INTRODUCTION

Musculoskeletal problems have become more widespread in recent decades all across the world. Work environment and job performance are substantial contributors for the development or worsening of physical and mental illnesses. Several work-related characteristics like prolong overstretched & awkward posture, repetitive movements, poor weight lifting techniques, psychological stressors have been identified as risk factors for WRMSDs.[1,2]

Musculoskeletal disorders can be defined by impairments of bodily structures such as muscles, joints, tendons, ligaments, nerves, bones & the localized blood circulation, caused due to primarily by work or work environment.

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Submission: 2nd Oct 2024 **Revision:16th Oct 2024** **Publication date: 9th Jan 2024**

Studies suggest that result in pain and functional impairment mainly affect neck, shoulder, elbow, forearm, wrist and hand due to development of work-related disorders. Work related musculoskeletal disorders leads to degenerative and inflammatory conditions mainly affecting the peripheral nerves, joints, ligaments, tendons and muscles which will lead to pain and functional impairment in later stages, mostly seen in upper extremities and neck region.[3]

Repetitive movements of hand and wrist cause peritendon inflammation and cellular proliferation, increased production of matrix components, tendon degeneration and functional losses. The chronic tendinopathies cause tendon and sheath degeneration and fibrosis in combination with inflammatory and proliferative changes. Repetitive movements lead to decrease in muscle mass and myofiber area and increase 1b non-contractile tissues.[4]

Risk factors of wrmsds are following;

Physical risk factors of work-related musculoskeletal disorders include awkward postures, forceful exertion, hand arm vibration, repetitive movements, mechanical compression.

Psychological risk factors of work-related musculoskeletal disorders include work pace, anatomy, monotony, work or rest cycle, social support from other colleagues of task demands.

Individual risk factors of wrmsds includes age, gender, sports activity, recreational activities, alcohol or tobacco consumption, previous work-related musculoskeletal disorders.[5]

Tailoring involves monotonous, highly repetitive tasks like cutting, assembly, pressing and finishing, performed in a sitting working posture with upper back curved and head bent, raising their elbows above/below the shoulders, bend their wrist downward and inward and bend their back forward over the sewing machine.[6,3]Constant awkward posture may develops imbalances in muscles which may create shortening and tightness of muscle[7] which leads to postural discomfort that increases with years of employment.

The tailoring industry of india is an unorganized sector, mostly run by private establishments. It provides employment for both men and women, majority from lower socioeconomic classes. The employees of this industry hardly ever benefit from occupational health and safety provisions. They lack any type of social security, so their ill-health and poverty go hand by hand and create a stupendous pressure from which they can hardly come out. In spite of these facts, there is dearth of published literature on this topic especially in this part of the country. Hence, the purpose of the study is to see prevalence of work-related musculoskeletal disorders among tailors in vadodara city.

LITERATURE SURVEY

- Ammne mary joseph conducted study on work, work space organization and discomfort of normal working in tailoring units. The study conducted by using 200 samples. The result showed that the women engaged in tailoring work were having low back pain, fatigue and stress. The conclusion was that if the tailoring adopts good posture so it will help to increase productivity and relieved from pain.[8]
- Narish amar etalconducted study on a frequency of work-related musculoskeletal disorders and ergonomics risk assessment among tailors. Study was done in 400 tailors. Body mapping chart was used for assessment. Results show 80% population had upper back musculoskeletal disorders. The study concluded that most tailors had a upper back musculoskeletal disorders.[9]

Adam H. Schwarts et al;conducted study on intra-rater and inter-rater reliability pf the Rapid Entire Body Assessment (REBA) tool. Eight observes were used to evaluate tasks which was performed two times in succession by the same individual. For this study secondary data analysis method was used. The results show REBA has high intra-rater reliability (ICC=0.925) for REBA.[10]

Tesfaye HambisaMekonne et al (conducted study on physical and environmental and occupational factors inducing work related neck and shoulder pain among self-employed tailors. Study was done on 419 tailors. Nordic Musculoskeletal questionnaire was used to assess risk of Musculoskeletal disorders.

The result of the study show shoulder pain (72%) and neck pain (0.83%). The study concluded that work related neck and shoulder pain which is induced by physical factors of work environment. {Ardalam Shariat et alconducted study on the banasamelayu version of CMDQ: Reliability and validity study in Malaysia.115 participants were selected in this study. Questionnaire was self-administered two times method was used. The results showed the range of kappa coefficients for the frequency, severity and interference scales respectively. The conclusion of the study was CMDQ confirmed high validity and reliability.[12]

MATERIALS AND METHODOLOGY

- **Study Site:** Vadodara City
- **Study Population:** Tailors
- **Sample Size:** 50
- **Type Of Sampling:** Convenient and purposive sampling
- **Study duration:** 6 months
- **Study design:** A cross sectional study

Inclusion Criteria

- Age group:20-45 years.
- Both males and females.
- Tailors working with machine.
- With minimum 2 years of exposure.
- Tailors willing to participate in study.

Exclusion Criteria

- History of trauma or any major illness.
- Having known condition of musculoskeletal, neuromuscular disease.

Materials used in the study:

- Consent form
- Questionnaire
- Pen

METHODOLOGY

A cross sectional study was conducted from december-2022 to may-2023 in the vadodara city. 50 Subjects of the vadodara city who were fulfilling the inclusion criteria had included in the study considering prevalence of musculoskeletal disorders. Written informed consent was obtained from all subjects before the start of the study. All the tailors were assessed regarding risk of work related musculoskeletal disorder. It was done using “rapid entire body assessment” and “cornell musculoskeletal discomfort questionnaire” was filled up by the investigator. The cmdq has 3 parts along with diagram of body regions. The first part included that during last week how often did participants experience ache, pain and discomfort. Second part included that how uncomfortable was that experience of ache, pain and discomfort. Third part dealt with that did this interfere with their ability to work. Also, the posture assessment was done by using reba (rapid entire body assessment). Collected data were compiled on microsoft excel worksheets to make graphical presentation. Ms word was also used to make tabular and detailed presentation.

RESULT

According to our study done on tailors in vadodara city, out of the 50 subjects considered for this study 28% of the subjects complained of the discomfort once every day. 26% And 18% subjects complained of the discomfort 1-2 times last week and 3-4 times last week.20% Of the subjects complained of discomfort several times a day.

As per the data obtained from this study about 88% of the subjects complained of discomfort in their lower back which became the most adversely affected region. Neck and foot were the second most complained regions for the discomfort by about 48% and 56% of the subjects respectively. Subjects complaining for discomfort in shoulder, upper arm, upper back, forearm, wrist, hip and thigh were 26%,18%,4%,46%,24%,26% and 20% respectively. Knee, lower leg and palm were also complained for discomfort frequently by 34%,48% and 18% of subjects respectively.

As per statistical analysis and derivation from the study about 50% male and 43.3% Females are at moderate risk. For further 10% males and 6.67% Females were found to be at low risk.

30% Males and 33% females are at high risk for work related musculoskeletal disorders. About 5% male and 13.35% Females are at very high

risk for work related musculoskeletal disorders. Postural and ergonomic changes are needed to be implemented for them immediately.

Table 1: Gender Distribution Among Tailors

Gender	No. Participants
Male	20
Female	30
Total	50

Age Distribution

Total no of participants	Mean Age	SD
50	48.54	2.42

Level Of Discomfort Among The Tailors

Table 2. Percentage Of Discomfort In Diff. Body Regions.

Discomfort at Body Regions	% of Discomfort in Body Regions
Neck	48%
Shoulder	26%
Upper Back	4%
Upper Arm	18%
Lower Back	88%
Fore Arm	46%
Wrist	24%
Hips/Buttocks	26%
Thigh	20%
Knee	34%
Lower Leg	48%
Foot	56%
Palm	18%

DISCUSSION

The textile industry is the largest manufacturing sector in india, accounting for around 20% of india's industrial output and 37% of its total exports. Therefore, adequate importance should be given to the welfare of the millions of workers employed in this sector, especially those working in tailoring industry, which is one of the pillars of this sector.[13]

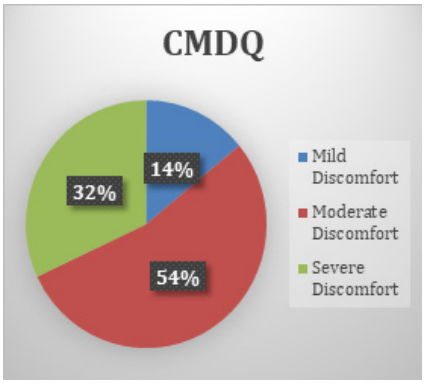
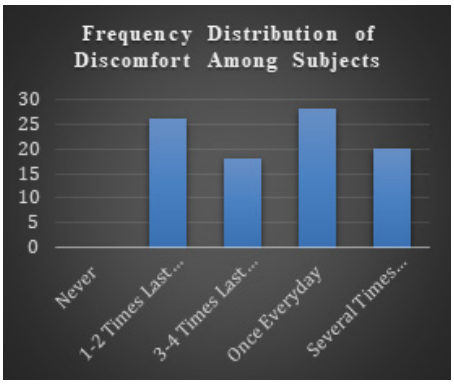
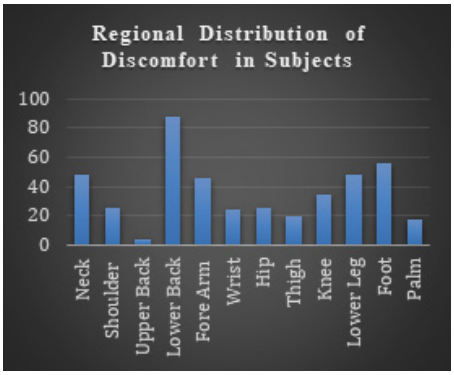


Chart 1: Severity Of Generalized Body Discomfort Among Tailors



Graph 1: Frequency of having Discomfort among tailors



Graph : Percentage of Discomfort in Diff Body Regions

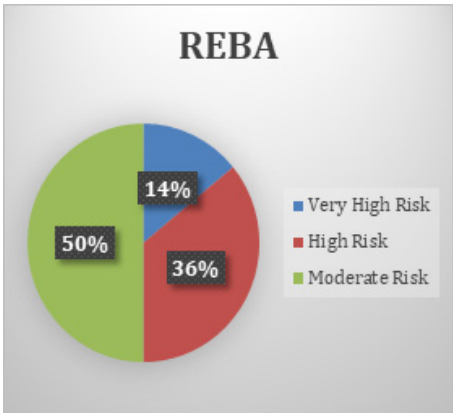


Chart 2: Percentage of Risk of Wrmsd's

Our study shows that there was more affection in lower back region (88%), followed by foot (56%), lower leg (48%), neck (48%), forearm (46%), knee (34%),

Shoulder (26%), hip (26%), wrist (24%), thigh (20%), palm (18%), upper arm (18%) and upper back (4%). The prevalence of musculoskeletal disorders among tailors was reported to be at: most common site being neck, followed by lower back, upper back and shoulder. Our study shows that female is more prone for high risk (33%) and very high risk (13.3%) Than males for high risk (30%) and very high risk (5%) of musculoskeletal disorders.[13]

Apart from age, sex and duration in the profession, musculoskeletal disorder was significantly associated with more than 8 hours work per day and it remain significant after adjusting with other variables.[1,2]Sokas et al compared sewing machine operators to a subset of the general population matched for age, race and gender and weighted toward lower socioeconomic groups and minority populations and found that sewing machine operators had a higher prevalence of self-reported upper back and upper extremity pain.[14]

Workstation ergonomics, as revealed by our study was significantly associated with musculoskeletal disorders, even when adjusted with other socio-demographic and work-related variables. The finding is similar to those of nag et al who observed that work postures and fatigue were major problems of the sewing machine operators.{20} So, there was a necessity to study wrmsds in tailors to prevent further complications and improve work station ergonomics.

CONCLUSION

Present study highlights the risk of WRMDs among the subjects engaged in tailoring occupation. This study has also taken into consideration their discomfort level in different regions of the body and ergonomically deranged work station although majority of work-related musculoskeletal disorders are of a mild intensity the initial stage and might be self-limiting in nature, however long-term awkward posture and long duration of working hours may lead to chronic, disabling, interfering persistent pain. It may lead to permanent physical disability adversely affecting work efficiency which will lead to severe morbid condition in future.

Limitation

Small sample size

Future Scope

The study should further progress in the future to establish correlation between the number of work hours and the risk associated for Wrmds.

Further study should be undertaken to see the affection of Wrmsds on activities of daily living.

Source of Funding: The authors received no financial support.

Conflicts Of Interest: None

Ethical Clearance: Approval was taken from ethical committee.

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