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A Cross-Sectional Study on Musculoskeletal Disorders among Textile Mill Workers in Ahmedabad City

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Abstract
Musculoskeletal disorders (MSDs) are the most common work-related health problem, with almost one in four workers reporting backache and one in five complaining of muscular pains. Manual handling, lifting, holding, putting down, pushing, pulling, carrying or movement of a load, is the largest cause of injury in the textiles sector. Hence, A cross-sectional study with the aim of assessing prevalence of MSDs was conducted among Textile mill workers. Methodology: The study was carried out in five textile mills located in and around Ahmedabad city during August 2011 to August 2012. Result: Prevalence of MSDs was 17.9%. Out of which, 15 (1.7%) had MSDs related to upper limb, 25(2.8%) had MSDs related to lower limb, 64(7.2%) had back pain while 55(6.2%) had bodyache. Occurrence of MSDs was related to pre-employment training status and Body Mass Index whereas MSDs occurrence was not related to age of the workers. Conclusion: MSDs are widely prevalent among textile mill workers and it has an important relationship with pre-employment training and BMI. So, more emphasis is needed to train the workers before they start their job to reduce MSDs in order to have a healthy workforce ultimately contributing to high productivity and gains.
Keywords: *Musculoskeletal disorders, textile mill workers, training.*

Introduction

In India, 20 million workers are involved in the manufacturing of textiles. Worldwide, India is the second largest producer of textile goods, which account for 20% of the national industrial output. Twenty million workers are employed in 1175 cotton mills across the country, representing a major occupational group. [1]

Industrialization is necessary for prosperity and at times for the survival of a Nation. The production is the real wealth of a Nation. Only industrialization is not enough, real benefit is brought by continuous top performance of the worker which is only possible by their good health. Industrial workers constitute only a segment of general population and the factors that influence the health of the population also apply equally to industrial workers i.e. water supply, sewage and waste disposal, nutrition and education, and the conditions prevailing in their place of work. [2]

Occupational environment is the sum of external condition and influences which prevail at the place of work and which have a bearing on the

health of the working population. The industrial workers today are placed in a highly complicated environment which is getting more complicated as man is becoming more ingenious.[2]

The textiles sector contains many hazards and risks to workers, ranging from exposure to noise and dangerous substances, to manual handling and working with dangerous machinery. Each processing stage, from the production of materials to the manufacturing, finishing, colouring and packaging poses risks for workers, and some of these are particularly dangerous for women's health.[3]

Musculoskeletal disorders (MSDs) are the most common work-related health problem, with almost one in four workers reporting backache and one in five complaining of muscular pains. Manual handling, lifting, holding, putting down, pushing, pulling, carrying or movement of a load, is the largest cause of injury in the textiles sector.[3]

Hence, a cross-sectional study was conducted with the aim to assess the prevalence of MSDs among textile mill workers.

Methodology

The study was carried out in five textile mills located in and around Ahmedabad city. The study was carried out during August 2011 to August 2012. A Pre-designed, pre-tested questionnaire was used to record information which included socio-demographic variables, detailed history of work exposure and Work related injuries & musculoskeletal disorders.

All the workers (889) of the five textile industries were studied after obtaining their written informed consent as well as due permission from the Department of Community Medicine, Ethics committee of the institute & concerned authority of the textile mills were also taken.

Result

Mean age of the workers was 43.5+11.0 years, ranged from 16 to 74 years. At the time of study, total 529 (59.5%) workers had addiction in form of chewing, smoking or drinking. Median duration of any addiction was 10 years. Majority 795 (89.4%) of the workers had 8 hours duty period while 15 (1.7%) had 10 and 79 (8.9%) had 12 hours. Cumulative cotton dust exposure ranged from 6 months to 57 years with median duration of 20 years. Workers with cotton dust exposure for more than 20 years were 420 (47.2%).

Prevalence of MSDs was 17.9%. Out of which, 15 (1.7%) had MSDs related to upper limb, 25(2.8%) had MSDs related to lower limb, 64(7.2%) had back pain while 55(6.2%) had bodyache. (Table 1)

History of musculoskeletal disorders didn't show significant association with age. Musculoskeletal disorders were equally present in all the age-groups. (Table 2)

Out of the total 889 workers, only 301 (40.1%) of the workers had pre-placement training for their job. Other trainings were taken intermittently by some which included use of personal protective devices 166 (22.1%), fire safety 217 (28.9%), first aid 174 (19.6%) etc. The proportion of musculoskeletal disorders was 2.6 times more in un-trained workers on how to operate machine safely as compared to trained workers. (Table 3)

According to body mass index examination, 22% workers were underweight, 13% overweight while rest were normal. Over-nourished/over-weight workers had 1.3 times higher history of musculoskeletal disorders as compared to normal. (Table 4)

Table 1: Prevalence of Musculoskeletal disorders (n=889)

No.	Musculoskeletal problems		Previous job (n=300)	Present job (n=889)
1	Upper limb	Shoulder joint	0	10 (1.1%)
		Wrist joint	0	5 (0.6%)
2	Lower limb	Osteoarthritis	1 (0.3%)	25 (2.8%)
3	Back pain		3 (1.0%)	64 (7.2%)
4	Body ache		0	55 (6.2%)
Total			4 (1.3%)	159 (17.9%)

Table 2: Comparison between presence of musculoskeletal disorders and age

History of musculoskeletal disorders	Age (in years)			Total	Chi-square
	< 40	40-49	> 50		
Yes	48 (5.4%)	46 (5.2%)	61 (6.9%)	155 (17.4%)	1.708 (df-2, P=0.426)
No	237 (26.7%)	247 (27.8%)	250 (28.1%)	734 (82.6%)	
Total	285 (32.1%)	293 (33.0%)	311 (35.0%)	889	

Table 3: Association between training on how to operate machine safely and history of musculoskeletal disorders (n=751)

Training on how to operate machine safely	Presence of musculoskeletal disorders		Total	Chi-square	Odd's ratio
	Yes	No			
Taken	32 (4.3%)	269 (35.8%)	301 (40.1%)	20.667 (df-1, P=0.0001)	2.622 (95% CI: 1.713 to 4.015
Not taken	107 (14.2%)	343 (45.7%)	450 (59.9%)		
Total	139 (18.5%)	612 (81.5%)	751		

Table 4: Comparison between presence of MSDs and Body Mass Index (BMI)

Body Mass Index[30]	Presence of MSDs		ODD's ratio	Chi-square
	Yes	No		
Under-nourished (n=200)	30 (3.4%)	170 (19.1%)	0.8369 (95% CI:0.5359 to 1.307)	2.132 (df-2, p=0.344)
Normal (n=557)	97 (10.9%)	460 (51.7%)	Reference category	
Over-nourished (n=132)	28 (3.1%)	104 (11.7%)	1.277 (95% CI: 0.7969 to 2.046)	

Discussion

Disorders of the musculoskeletal system are the single largest group of work-related illness in the developing and developed world. Sedentary working style with wrong posture for long time can be important risk factor for the development of this disorder.[4]

Prevalence of MSDs in the present study is 17.9%. Guo et al[5] in Taiwan observed prevalence of MSDs as 35.2%. In another study conducted by Fantahun et al[6], prevalence of MSD was 6.3%. Jahan et al[4] in Bangladesh observed prevalence of MSD as 60%.

The origin of MSDs is complex and multi-factorial. Amongst various risk factors, such as heavy lifting and high job demands, it has been suggested that high body mass index (BMI) (overweight and obesity) might be an independent risk factor for MSDs. For symptoms of neck/ shoulder, upper and lower limbs, evidence was also found that high BMI is an independent risk factor for the development of (symptoms of) MSDs.[7]

Current study observed a 1.3 times higher risk of development of MSDs among obese/overweight compared to normal weight workers. Jahan et al[4] also observed increased risk of MSDs among overnourished workers (p<0.07)

Training enhances skills of workers hence reducing the chances of occurrence of MSDs. In the present study a significant association was observed between occurrence of MSDs and untrained workers. Pre-employment training should be a compulsory exercise in every textile mill as unskilled workers represent a major workforce in industries in developing countries.

Conclusion

Hence, from the above study it can be concluded that MSDs are widely prevalent among textile mill workers and it has an important relationship with pre-employment training and BMI. So, more

emphasis is needed to train the workers before they start their job to reduce MSDs in order to have a healthy workforce ultimately contributing to high productivity and gains.

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