

Cotton spinning Volume 3

Work Related Musculoskeletal Disorders in Cotton Spinning Occupation : An Ergonomic Intervention

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Abstract – Cotton spinning is an important operation in small scale and cottage textile industries in India. A large number of women workers in these industries perform cotton spinning task adopting squatting posture in traditional workshops. A Dutch Musculoskeletal Questionnaire (DMQ) was used to evaluate 40 operators regarding work related musculoskeletal disorders (WMSDs). 50% operators were suffering with musculoskeletal complaints due to working conditions. They were observed and evaluated with the Rapid Upper Limb Assessment (RULA) technique and their exposure to the WMSDs was assessed. From the observations and analysis of the result it was concluded that the health of spinning operators were highly affected due to improper body postures and workload. Twisting, bending and over reaching are the resultant of poorly designed workstations. These actions force them into non neutral position that increases the overall discomfort and pain at the lower back, neck and shoulders. Certain aspects regarding the ergonomic evaluation for those workers are discussed in this study.

Index Terms— Ergonomics Evaluation, Musculoskeletal Disorders, DMQ, RULA.

I. INTRODUCTION

Work-related musculoskeletal disorders (WMSDs) are one of the greatest occupational health concerns today [1]. Stoop and squatting postures are common in developing countries such as India [3] especially in small scale industries. Most of the manually energized operations in these industries are carried out using such postures. One such industry is cotton spinning industry where operators are mostly women and 91% of them suffer from WMSDs [2]. Cotton spinning wheel, more commonly known as “charkha”, is hand-powered device for spinning cotton yarn from pressure clamp. Spinning

operation is performed in a squatting position in which operators rotate spinning wheel sitting down on the hard and flat surface with folded knees without any backrest. Fig. 1 shows the details of posture adapted.

The task of rotating the wheel for cotton spinning is repetitive and continuous for 8 hours of working in a day. In this condition, the back is bent excessively and postures of different parts of body dramatically deviate from the neutral. The design is essentially a compromise between the operators' biological needs, as determined by the ergonomics guidelines and physical requirements of the equipment [3].



Fig.1: working posture adapted in order to perform spinning operation

The objective of the present study was to assess the workstation and work postures and to study the prevalence of musculoskeletal problems in cotton spinning operators' population.

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