

WORK POSTURE ASSESSMENT OF TAILORS BY RULA AND REBA ANALYSIS

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Abstract: Tailors were performing various activities to create new pieces of clothing from patterns and designs or alter existing garments to fit to the customers. Due to nature of these job tailors adopted awkward posture and repetitive motion, which cause musculoskeletal discomfort and occupational health hazards. Therefore the present study was undertaken to evaluate the various tasks performed by tailors, and work posture adopted by them, while operating the sewing machine. The study was conducted on 60 male respondents engaged with tailoring profession from Pantnagar (Uttarakhand, India). The result of postural analysis by RULA and REBA score indicate that more than 65%, 60% and 58% of the respondents were under in high risk when performing ironing, stitching and cutting activity at the workplace. The majority of the respondents reported that high rate of musculoskeletal discomforts were not avoided due to the job characteristic of tailors. The above findings indicate that the tailors were doing very hard but not realizing the risks of musculoskeletal discomforts associated with their workstation, tasks and working postures.

Keywords: awkward posture, musculoskeletal discomfort, tailors, workplace.

INTRODUCTION

In India, textile industry had its beginning during the first half of the 20th century and witnessed impressive growth during the last four decades. The textile industry is primarily concerned with the production of yarn, and cloth and the subsequent design or manufacture of clothing and their distribution. The process of producing complete garment is include spinning the yarns, making cotton bundles, preparing fabrics, cutting and stitching of the fabric etc. Whereas, textile sector also includes self employed garment workers or tailors, who work in their own work shop and only prepare garment as per the choice of customers. The main activities performed by the tailors at their workstation are dealing with the customer, taking measurement of the customer, cutting of the fabric, stitching of the fabric, finishing of the stitched garment, ironing to the stitched garment and inspection of stitched garment.

Tailors face a substantially higher risk of muscle pain and injury than workers involved in other jobs because the frequency of postural discomfort increases with years of employment.

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Factors such as repetition, force, stress and strain, and vibration are associated with higher rates of injury. Even though many technologies have been developed in textile sector, but the tailors are still using the foot treadle and hand wheel sewing machine. These machines work on manual power have been the cause of some accidents due to the repetitive and continuous pressure giving by hand and foot.

Tailors are working at the workplace from morning to late night. Workspace is concern with the design of the local space in which workers must spend considerable time and efforts for doing their job. In this respect, it is very personal process in that workers feel a sense of ownership for the workstation. Any mismatch between the worker and the work environment leads to mental and physical stress causing occupational risks. In the fast-paced environment of tailoring, a common attitude is that accidents are inevitable. But injuries means losses i.e. loss of money, loss of time and loss of productivity. The compatibility between the workers and the workstation is very essential. While designing these workstations, clearance, reach and comfort of the workers need to be taken into consideration.

The tailor's job involves monotonous, highly repetitive tasks performed in a sitting working posture with upper back curved and head bent over the sewing machine. The work is visually demanding and requires a high degree of concentration and accuracy. Research on working conditions and associated problems in the garment workstation unit have been conducted by **Maier, E. et al. (2002)** and his findings supported the outcomes expected from work environments with poor ergonomic features, including constrained postures, repetitive motions and strong visual demands. **Ranney et al. (1995)** suggested that one of the worst aspects of sewing machine operations in the garment manufacturing is the body posture operators are forced to assume throughout the workday. Anecdotal evidence points to congestion in people and equipment, excessive heat and humidity, poor furniture and physical workstation design. Prolonged sitting, in unnatural postures is not uncommon and is often accompanied with seats that have no backrests. So, the purpose of present study is to combining ergonomics with tailors who are involved in tailoring activities, to elicit the role of physical work demand and to assess the potential risk factor for developing musculoskeletal symptoms in workers involved in tailoring operation. Hence, the present study was undertaken with the following objectives:

- To analyze the tasks performed by tailors when using sewing machine.
- To assess the different work posture of tailors while operating the sewing machine.

MATERIAL AND METHODS

Purposively random sampling design was used to select the study area and the selection of the respondents from Pantnagar, of U. S. Nagar District of Uttarakhand state. Total sample sizes of 60 male respondents were taken for the present study. These 60 respondents were working in 14 tailor boutique shops.

The descriptive data was collected with the use of precoded interview schedule and anthropometric measurement. Experimental data was collected with the help of RULA (Rapid Upper Limb Assessment) and REBA (Rapid Entire Body Assessment). Three major activities were selected i.e. cutting of the fabric, stitching of the fabric and ironing to the stitched garment, for the assessment of RULA and REBA and for each activity 20 respondents were asked to performed task.

RULA (Rapid Upper Limb Assessment)

It is a survey method developed by **Mc Atamney and Corlett, (1993)** for use in ergonomics investigation of workplaces where work related upper limb disorders are reported. A coding system is used to generate an action list which indicates the level of intervention required to reduce the risks of injury due to physical loading on the operator.

REBA (Rapid Entire Body Assessment)

REBA was proposed by **Hignett and McAtamney (2000)** and use as a quick assessment of the postures of the upper limbs as well as lower limbs along with muscle function and the external loads experienced by the body. A coding system is used to generate an action list which indicates the level of intervention required to reduce the risks of injury due to physical loading on the operator.

RESULT AND DISCUSSION

RULA score indicate that in cutting activity, the same proportion of 40 percents of the respondents were under score in 3 or 4, and 5 or 6 which means change soon and further investigate. Only 15 percent of the respondents were under in safe zone (figure-1). In stitching activity, majority (55%) of the respondents were under score in 5 or 6, whereas 30 percent of the respondents were under score in 7 or more, which means they were under in high risk (Figure-1). In ironing activity, majority (65%) of the respondents were under score in 5 or 6, whereas 25 percent of the respondents were under score in 7 or more, and it was found that in ironing activity no one in safe zone (figure- 1).



Figure 1 - RULA score in various activities

REBA score indicate that in cutting activity, with same proportion of 45 percent of the respondents were under score in 2 or 3 and 4 or 7, whereas 5 percent of the respondents were under score in 8 to 10 which means they were under high risk. In stitching activity, majority (40%) of the respondents were under score in 11 or more, which indicate that respondents were under at very high risk and about 35 percent of the respondents were under in 4 to 7 score, which indicate that respondents at medium risk. In ironing activity, 30 percent of the respondents were under score in 11 or more, which means respondents were under at very high risk and no one at low risk and in safe zone in ironing activity of the tailors (Figure 2).

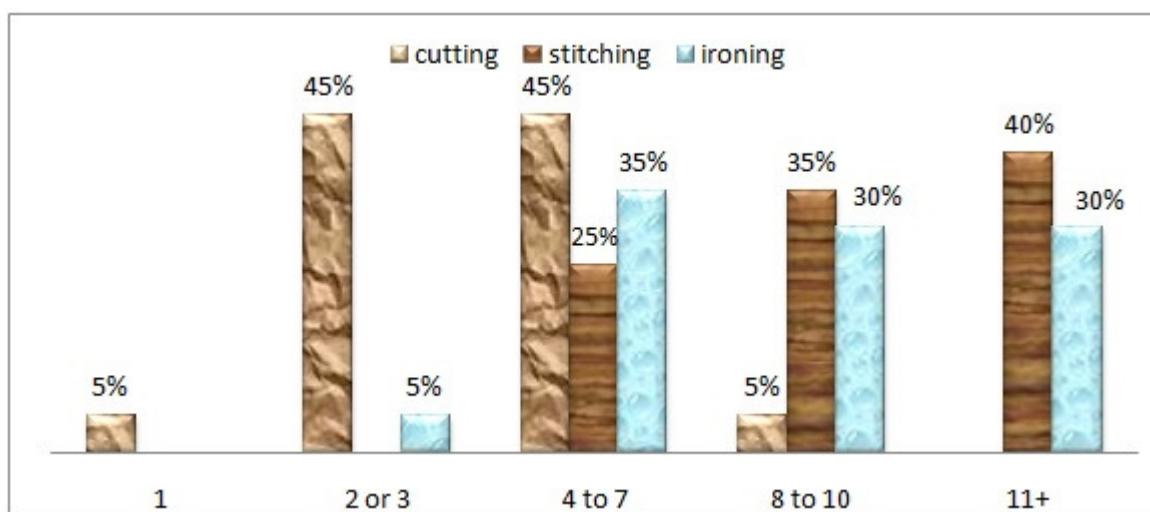


Figure 2- REBA score in various activities

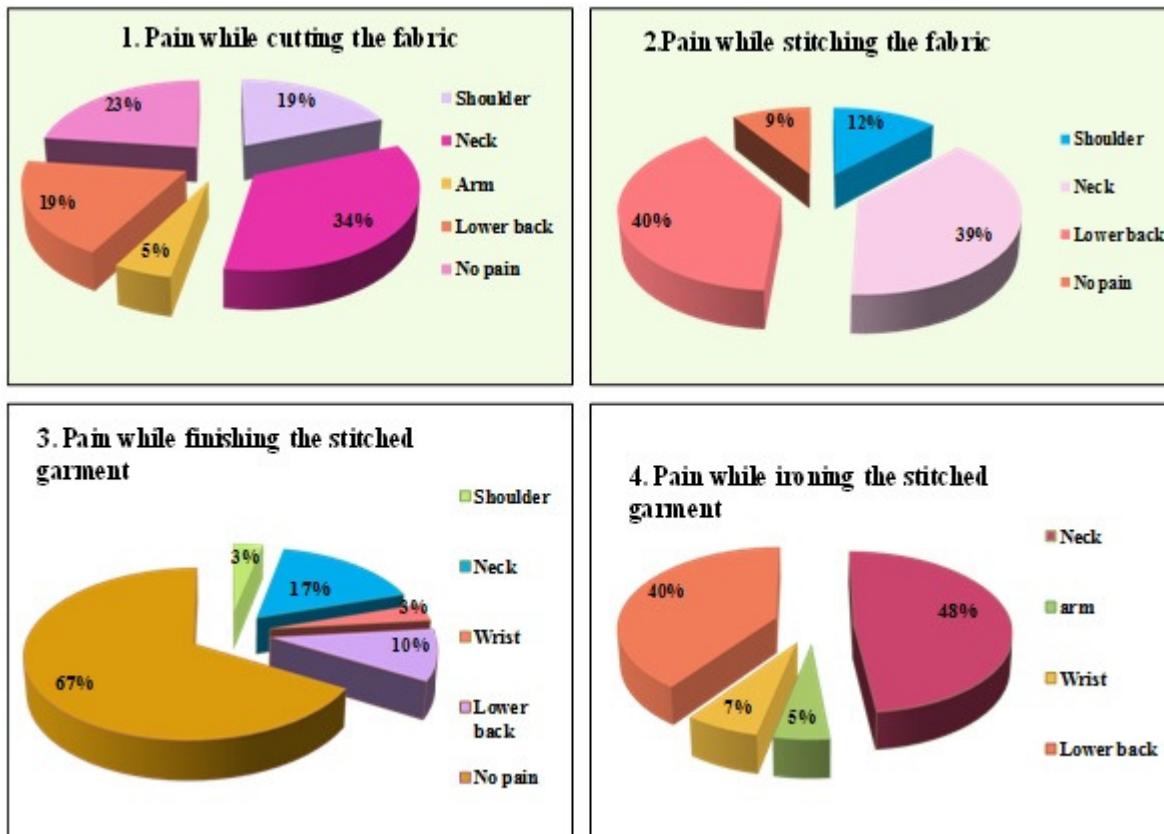


Figure 3: Pain in different body parts while performing various activities

The various static workstation activities lead to prolong sitting which cause musculoskeletal discomfort mainly in neck, shoulder, lower back and upper back. Majority of the respondents reported pain in neck and shoulder when performing cutting activity. Respondents were also complaining occurrence of severe lower back pain when they engaged in stitching and ironing activity. This is because after prolong sitting and standing task and they have stress of work from the whole day work task.

The above figure 3 shows the pain in different body parts of the tailors while performing three major activities i.e. cutting of the fabric, stitching of the fabric and ironing to the stitched garment at the workstation. Tailors were experiencing high frequency of pain when ever work has done with medium intensity of pain in different parts of the body. Some of the respondents faced problems to reach comfortably at the workstation for performing different activities related to tailoring.

Conclusion

Tailors are manual workers who work at the workstation for a period of time with repetitive activities like cutting the fabric, stitching the fabric, finishing, ironing etc and mainly adapting awkward posture repeatedly in each continuous process of preparing garment. RULA and REBA scale revealed that none of the respondents were having acceptable posture

to be continued. Maximum number of the respondents adopted different posture that were not acceptable where they should be investigated further and change soon or immediately so that the respondents may not be in danger of musculoskeletal disorders. The risks for tailors have been linked to conditions adverse to the health. Thus an ergonomically fit workstation design was suggested by giving the recommended features to have smooth work flow of the tailors.

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