IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

An Overview: Occupational Health Related Musculoskeletal Disorder Among Handloom Weavers In India

[1]Aarthy. K, [2]Dr.R.I. Sathya,[3]G. Parasakthibala

[1]M. Sc Textiles and Fashion Design,[2]Senior Professor, Director - DDU,[3]Guest faculty

[1]Department of Home Science,

[1]The Gandhigram Rural Institute, Dindigul, India

ABSTRACT

Textile industry in India contributes a lot to the growth of Indian economy and plays an important role in providing the employment. Handloom is one of the oldest industries in India, where a considerable number of rural people are engaged in weaving. Worker's well-being is highly associated with the productivity and cost benefits of any industries. Handloom weavers work for long hours in very small spaces with poor ventilation and low lighting levels with uncomfortable postures. Long hours work with traditionally designed tools and un-ergonomic work places can cause musculoskeletal disorders (MSDs) and other health problems. This review study seeks to identify various MSDs and occupational health problems among workers in the handloom sectors. The study also reviews the effects of improvements in ergonomics on occupational health, productivity, and cost benefits. The study emphasizes the need for more investigation into weavers' postural strain and recommends that ergonomic workstations be incorporated to reduce the negative effects of the workers' existing positions. Improving the weaver's work position could enhance their quality of life.

Index words: occupational health, handloom, musculoskeletal disorders.

INTRODUCTION

India has always been known for its splendid crafts and Indian handlooms have attracted attention among the people all over the world (Siddiqui et al., 2021). The handloom sector has a unique place in our economy. It has been sustained by transferring skills from one generation to another. The strength of the sector lies in its uniqueness, flexibility of production, openness to innovations, adaptability to the supplier's requirement and the wealth of its tradition (Vyshnavi et al., 2017). Handloom weaving encompasses a multitude of tasks, which demands repeated movement of upper and lower limbs to operate pedals and shuttles, with arms rose away from the body. About 70% of workers do not have any insurance to compensate them in case of occupational diseases and injuries. The working environment engaged in handloom sector are informal in nature and are vulnerable in terms of health associated with their particular occupation (Koiri, 2020). During the weaving process, handloom workers assume awkward postures, significantly contributing to their reduced working efficiency and the high incidence of musculoskeletal disorders. Most workers must maintain static and uncomfortable positions, experiencing contact pressure while performing their tasks. "Work-related musculoskeletal disorders (WMSDs) are painful disorders often caused by overuse of the muscles, joints, nerves, tendons and soft tissues of the body. WMSDs are one of the costliest occupational disorders because of their consequential impact on workers' health and productivity at work" (Stalin et al., 2024). There are several safety and health issues associated with the textile industry. This article aimed at developing a framework for understanding risks to textile workers resulting from lack of health and safety standards in industries (N. Singh, 2016).

LITERATURE REVIEW

The definition of occupational health was adopted by the joint ILO/WHO (International labor organization/ World health organization) in 1995. “The promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention among workers of adverse effects on health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of workers in an occupational environment adapted to physiological and psychological capabilities; And to summarize, the adaptation of work to man and of each man to do his job”. And The definition of Occupational hazards “Source or situation with a potential for harm in terms of injury or ill health, damage to property, damage to the workplace environment, or a combination of these`` (Riaz & National Textile University, Faisalabad, 2007).

People health is related to the occupation. Occupational health and safety is a complete part of the common notion of health that is a part of socioeconomic development. Occupation health affects everyone directly or indirectly. Depending on their occupation the industrial workers may be affected to the below types of hazards. Occupational diseases Musculo-skeletal disorders (MSD) like carpel tunnel syndrome (CTS), cumulative trauma disorder (CTD), ligament strain, neck and shoulder pain etc. Occupational disorders that involve muscles, tendons, joints, blood vessels and nerves. These types of occupational disease are due to improper lifting the objects and handling heavy cloth rolls. Occupational disorders that involve muscles, tendons, joints, blood vessels and nerves. These types of occupational disease are due to improper lifting the objects and handling heavy cloth rolls (SUBASH & DAS, 2019).

In developing countries, handloom is an important cottage industry where traditional ways of handloom weaving are still practiced (Stalin et al., 2024). Presently, handlooms contribute only 20% towards the total cloth production in the country. Though, Indian Textile Industry with its power looms has achieved a steady development in terms of production and profits, in the last two decades, handloom industry did not show expected improvement (Singh et al., 2016). Handloom sector in India provides employment (direct and indirect) to 43 lakh peoples in India. It contributes 15% of cloth production in India and 95% of the global hand-woven clothes (Satheeshkumar & Krishnakumar, 2020).

India has a long history of handloom weaving, with the earliest records dating back to the Indus Valley culture. India is the sixth-largest exporter of textiles and apparel worldwide India accounts for 5% of the worldwide textile and clothing trade. Over 45 million people are employed directly by the handloom sector, and over 10 million people, primarily women and rural residents, rely on it for their livelihoods. The number of families involved in handloom operations was 31.45 lakhs according to the Fourth All India Handloom Census conducted in 2020–2021.

According to the Handloom Census 2019–20, there were around 35,22,512 handloom workers employed nationwide, of whom 25,46,285 were women, accounting for 72.29 per cent of all handloom employees. Additionally, the Office of Development Commissioner has 16,87,534 women artisans registered with them (Fareq & Kwatra, 2023).

Work-related stress mostly impacts behavioural, mental, as well as physical outcomes, performance, job satisfaction, and organizational commitment. Specifically, it can be argued that organizational factors may influence health directly or in directly by increasing exposure to job-level hazards (Koiri, 2020). Long work hours and strenuous activities put weavers at risk for work-related musculoskeletal disorders (WMSDs), predominantly low back pain (LBP) (Durlov et al., 2014). Mainly the workers engaged in handloom sector work as pieceworkers, the self-employed workers, the paid workers and the unpaid workers in family business. Health risks associated with workplace can be hazardous chemicals; heat, unsafe machines, noise, dust and psychological stress that instigate occupational diseases and can worsen other health problems (Koiri, 2020). MSDs are a major cause of morbidity and in many countries have emerged as the leading cause of occupational injury, illness and disability. Globally the burden of MSDs led WHO to declare 2000–2010 as the Bone and Joint Decade (Siddiqui et al., 2021).

MSDs AMONG HANDLOOM WEAVERS

1. ***Stalin et al. (2024)*** state that a sample of 121 handloom weavers from different weaving clusters in Kanchipuram District were included in the study. Among handloom weavers, musculoskeletal problems are highly prevalent, especially in the knees (62%), and ankles/feet (54.5%), according to preliminary results. Gender-specific WMSDs were observed to be statistically significant in the neck ($p = 0.031$), upper back ($p = 0.021$), and thighs/hip/buttocks ($p = 0.028$). Musculoskeletal morbidity has been found to be significantly influenced by factors such repeated jobs, extended sitting posture, and poor workstation ergonomics.
2. ***Siddiqui et al. (2021***) investigated the risk variables for musculoskeletal problems in different body parts among weavers who use power looms and traditional handlooms. Compared to power loom weavers, handloom weavers had a greater prevalence of musculoskeletal problems, especially in the upper back (84–45%), lower back (82–50%), knee (60–35%), and shoulder (76%–42%), respectively. Long years of employment and advanced age are important risk factors for MSDs. Compared to power loom weavers, traditional handloom weavers had a comparatively higher prevalence of MSDs, especially in the upper back, lower back, and shoulder. `
3. ***Singh et al. (2016)*** Data analysis reveals that the majority of workers were illiterate, OBC, Muslim, and between the ages of 41 and 50. They belonged to a medium-sized extended family and had no land. The family's head worked as an unskilled laborer and made just Rs. 5000.00 a month. The majority had five to ten years of experience working for daily wages; the length of work served as the foundation for determining wages; payments were made daily; and cash was the method of payment. The majority of them work six to eight hours a day, seven days a week, with only two 16–30 minute breaks. While the summer temperature and winter humidity were above the required levels, the light and noise levels were below. The main issues were stated to be knee-thigh pain, headache, back pain, and neck-shoulder pain. Additionally, almost 60% reported having gastric discomfort, constipation, and asthma.
4. According to ***Koiri (2020),*** about 80% of workers have health problems, which is a significant worry in the handloom sector. More over half of the respondents said they had a musculoskeletal disorder, making it the most prevalent condition in the sample. Statistical research found a favorable and significant correlation between the severity of health concerns and the number of years of work experience and working hours.
5. ***Durlov et al. (2014),*** studied that low back pain was the most common ailment in the sample, with 68% of participants reporting having it. 2 percent of people with low back pain (n5119) had severe disabilities, 46% had moderate difficulties, and 52% had mild disabilities, according to an analysis of data from the Oswestry Low Back Pain Disability Questionnaire. A statistical analysis showed a significant positive correlation (P,0.05) between the number of years of work experience and the severity of lower back pain.
6. ***Satheeshkumar et al. (2020)*** evaluated the prevalence, features, and effects of work-related musculoskeletal diseases (WMSDs) among handloom sector workers in Kerala. After analyzing the prevalence of WMSDs in nine different body areas, it was found that the lower back had the highest prevalence (61.77%), followed by the hip (53.74%), elbow (51.52%), neck (44.32%), upper back (38.78%), shoulder (35.46%), knee (34.90%), ankle (22.16%), and wrist (14.96%). Body mass index, gender, age, length of employment, and work section were all strongly correlated with WMSD symptoms at body areas.
7. The research of ***Awasthi et al. (2016),*** 80 male handloom weavers were chosen from Kanpur Nagar's Rail Bazar and Sujatganj durrie units. The QEC and REBA tools were used to evaluate the risk of musculoskeletal disorders. Workers' and observers' assessments of postural issues connected to work in several body areas, such as the back, neck, shoulder/arm, and hand/wrist, were documented via still photography in order to analyze working posture utilizing REBA. Based on the data, the shoulder/arm had a mean score of 37, which is in the high risk area, while the neck, back, and wrist/hand had mean QEC scores of 17, 31, and 43, respectively, which were in the very high risk group. The mean REBA score was 11, which indicates a very high degree of risk. According to REBA, 43.75 percent of weavers were at very high risk, while 56.25 percent were at high risk. Additionally, QEC reports 38.75 percent of weavers in the very high risk group and 61.25 percent in the high risk category.

8. ***Pandit et al. (2013)*** found that there are four main areas where design changes are needed for sitting, treadling, flying shuttle, and cloth rolling processes. Necessary to increase productivity while requiring less manual labor. 88% of weavers reported neck pain, 86% reported low back pain, 76% reported shoulder pain, and 58% reported ankle pain.
9. Research by ***Neeraja et al. (2016)*** sought to determine the frequency of eye strain symptoms and musculoskeletal pain among Andhra Pradesh weavers. Eighty-six percent of the weavers had neck musculoskeletal pain. Visual strain symptoms were shown to be prevalent over the 12-month study period (47%), with fatigued eyes (41%) being the most prevalent complaint. Over the course of a week, 56% and 25% of weavers, respectively, reported experiencing discomfort and visual strain. Weavers who experienced discomfort throughout the course of a year were more likely to indicate dissatisfaction with their work ($p<0.01$) and a lack of choice in choosing their career ($P<0.02$).
10. ***Lakshmi et al. (2020)*** investigated the frequency of workplace ergonomic risk assessment is among women weavers. The WERA score for female weavers working on various looms and activities was equal to 49 for floor charka (warp yarn preparation), 50 for tying, 48 for weaving on heddle looms, and 46 for pit looms. These activities were deemed to be at high risk, while the scores for spinning wheel (weft yarn preparation) were 42 and 32 for weaving on standing looms, respectively. The investigation came to the conclusion that the current loom design does not accommodate the weavers' anthropometric and physiological needs.
11. ***Sarkar et al. (2016)*** examined the health problems Puducherry weavers faced. Handloom weavers experienced musculoskeletal issues such as knee, joint, and back discomfort as a result of their extended workdays in hazardous positions on conventional looms. The inadequate ergonomic design of the workplace caused weavers to complain of issues like joint, foot, neck, and back pain.
12. ***Rehman (2019)*** measured the frequency of musculoskeletal discomfort complaints in several body parts. Over 75% of the weavers had musculoskeletal discomfort. Over the course of seven days, it was discovered that the neck (69.72%) and shoulder (69.17%) regions had the largest musculoskeletal issues, while the ankle (23.89%) area had the lowest. Age, income, work experience, number of hours worked daily and weekly, workplace conditions, and posture were all strongly correlated with musculoskeletal issues among weavers.

CONCLUSION

The potential risks at work that might lead to musculoskeletal disorders are not well understood by the handloom weavers. It was found that poor posture and inappropriate execution of several duties during the handloom weaving activity contributed to musculoskeletal health issues in the weavers. Employees who often work in unfavourable environments and are exposed to these risks experience severe occupational health problems that lower their quality of life. The majority of weavers in India come from low socioeconomic backgrounds, and the health problems resulting from their work further increase their financial burden. Weavers' postural strain must be reduced, and ergonomic design and intervention into weaver workstations are recommended in order to minimize the adverse effects of handloom weavers' current working postures. Workers are not aware of health and safety since they have no knowledge or trained properly. Therefore, the only way to achieve a safe and healthy work environment is to encourage employees to apply safety measures and be aware of occupational health and safety. Elimination, replacement, engineering controls, administrative controls, and personal protective equipment are the steps in the hierarchy of controls used to establish health and safety standards in the textile industry.

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